Stewardship of Public Lands

a handbook for educators

aascu

American Association of State Colleges and Universities

Contents

The Stewardship of Public Lands: An Initiative of the American Democracy Project

George L. Mehaffy

Throughout the United States, but especially in the West, the question of who will control public lands is a hotly debated topic. The public lands of the West (national parks, forests, grazing and prairie lands) are all sites of contention. The major controversies, seen through the actions of various interest groups, often reflect competing concepts of land use. Embroiled in the battles are various interests—timber, mining, oil and gas producers, developers, farmers, ranchers, hunters, business owners, recreational users and environmentalists—all groups who assert claims to a land's influence and use. Yet whose interests have primacy? And in a democracy, how are the interests of these groups addressed and resolved?

These issues of land use serve as a case study for undergraduate students learning to be informed, engaged citizens in our democracy. Because learning to be effective citizens is critical to the health and vitality of our democracy, in 2004 the American Association of State Colleges and Universities (AASCU) created a civic engagement program called the American Democracy Project (ADP). With more than 230 participating institutions, the American Democracy Project seeks to focus attention on how America's public colleges and universities, especially those that are members of AASCU, can prepare undergraduates for lives of civic engagement. To fulfill this mission, ADP has created a series of initiatives to develop course materials and teaching strategies that engage undergraduates in issues of citizenship.

The controversies surrounding our public lands create a perfect opportunity to consider the role of citizens and interest groups in the resolution of such disputes. And nowhere are the disputes more prominent than in the world's first national park: Yellowstone National Park. Yellowstone's iconic

George L. Mehaffy is vice president for academic leadership and change at AASCU.

status seems to intensify the controversies that exist. Whether the issue is wolf reintroduction, brucellosis in bison, winter use of snowmobiles or the endangered status of grizzly bears, the battles over these issues are intense, prolonged and seemingly intractable. As a result, Yellowstone provides a perfect setting for a case study of public land use in a democracy. Therefore, in 2005, the American Democracy Project created the Stewardship of Public Lands initiative. This initiative gives faculty the opportunity to develop course materials and teaching strategies—stemming from the Yellowstone controversies—for use in helping undergraduates become informed, engaged citizens.

For the past five summers, the Stewardship of Public Lands initiative has invited faculty representatives from participating AASCU institutions to spend a week in Yellowstone National Park with our partner, the Yellowstone Association, studying controversies about wolves, bison, snowmobiles and grizzly bears. To date, more than 100 faculty members from more than 50 campuses have participated in the program. Each summer, the week-long program begins with study of the science and history of the controversies as participants listen to scientists and park rangers. Towards the end of the week, now armed with substantial information about the issues, the faculty participants travel beyond the park borders to interview local citizens on both sides of the issues, including political activists, business people, ranchers and ordinary citizens. The seminar concludes with in-depth discussions of how faculty members can design learning experiences for undergraduate students. In some cases, faculty create programs to bring students to study the controversies in the Yellowstone ecosystem. In other cases, faculty develop programs focused on local public land and resource issues. Sometimes, instead of complete programs, faculty simply incorporate material and insights from the Stewardship of Public Lands seminar into various existing courses.

The seminar raises important questions about the core concept of public lands. As the seminar participants work through the week, they begin to realize that one of the great divides between citizens grows out of very different conceptions of land use. One key question that keeps appearing is the concept of a national park. For some, a national park should be an untouched preserve, with human use substantially limited. For others, a

national park is a place for recreation, where human use is given priority. Underlying both of those perceptions are deeper feelings about nature and the relationship of human beings to the natural world.

Growing out of these core beliefs about parks and nature are a wide variety of attitudes towards the lands that surround the Park and that make up the greater Yellowstone ecosystem, particularly the public lands that are primarily national forests. Here, too, depending on one's perspective, ideas about land use differ substantially. The divergent views about the human use of national forests are reflected in governmental agencies, with the Interior Department managing national parks, and the Department of Agriculture managing national forests. Each of these federal agencies has a very different mandate, management philosophy and set of practices.

The Stewardship of Public Lands seminar also looks at the actors in these controversies. One key group of stakeholders are the landowners and residents of the Park's border communities, many of whom depend on Yellowstone Park and its surrounding ecosystem for their livelihood. For them, the decisions of government agencies and the outcomes of many of these controversies are critical to their well-being. For some of these citizens, the federal government is often considered a remote entity—a group of individuals and agencies far away in Washington who may not know much about local circumstances. However, other citizens, who live in communities across the United States, are equally passionate about their right to have a say in what are, after all, national public spaces. These opposing views often get expressed by interest groups on both sides as they engage in lawsuits, environmental impact studies, demonstrations and various kinds of protests. One of the concerns prompting this initiative was the realization that today, citizen participation is often limited to membership in an interest group. Therefore, the Stewardship of Public Lands seminar seeks to provide opportunities for faculty to develop programs to help undergraduates understand the value as well as the limitations of interest groups as one form of citizen participation, while developing ideas about other ways that citizens can be engaged in public issues.

As a participant of the Stewardship of Public Lands seminar, I have met and interacted with all of the faculty participants over the past five years.

About a third of the faculty had never been to Yellowstone before, and many others that had been came as part of a family vacation years ago. Yet we also had participants with substantial background knowledge of Yellowstone and experience with the issues. Faculty members who have participated come from many different disciplines, as well as from varying campus circumstances. Participants often report being powerfully influenced by the program and its vision of citizenship development.

As I reflect on the past five years and my own deepening understanding of these issues, I'm struck by three significant lessons that have emerged for me and many of the other participants. The first is that these issues are not new or novel. The history of public land disputes in the United States extends back to our beginnings as a country. The actors and the specific issues change from time to time and place to place, but the core questions remain the same: Whose land is this, and how shall it be treated? What is the value of wildlife, scenery and the forests? Why should we set aside land and protect it from development? Douglas Brinkley's new biography, *The Wilderness Warrior: Theodore Roosevelt and the Crusade for America*, chronicles the bitter struggles over land use at the beginning of the 20th century. Ken Burns' film series, *The National Parks: America's Best Ideas*, also documents the controversies over public lands, from the beginning of the national park idea in the 1850s and '60s to the present day. That long history of conflict is neatly summed up in the observation by William Faulkner, that "the past is not dead. In fact, it's not even past."

The second lesson is that just as the conflicts of the past are still with us, these conflicts will persist into the future. At times they will be more or less intractable, and some may appear to be resolved. But these are not simply specific issues to be addressed, but manifestations of long-lasting philosophical debates. Students studying these issues, hoping for a final solution for resolution, will likely be disappointed. Yet in a democracy, citizens are often called upon to enter the debate and do their part as thoughtful, engaged participants—all the while knowing that their work, while vital, will have to be reinforced by the work of citizens not yet born. That is the sacred obligation of citizens in a democracy: to be engaged in the issues of the day, and to pass along to the next generation the best solutions

they can devise, while hopefully also preparing the next generation to be informed and engaged.

Finally, a third lesson that has emerged from this set of experiences may be the most important: the lesson of finding common ground. Each year, the seminars begin by exploring the elaborate science and history of each of the controversies. Our speakers—park rangers, naturalists and historians—are some of the most knowledgeable people in the world on their topics. Our work early in the week is typical of most college courses, a thorough examination of the issues, using the lenses of disciplines. By mid-week, our participants have developed a substantial knowledge of the science and history of the controversies. But some of the most meaningful experiences come later on in the seminar when participants travel beyond the park to meet and talk with community members on both sides of the issues. Often in college courses, set in the context of a university, the only perspectives available are perspectives based in disciplines. In this seminar, one of the critical ways of viewing the issues is through the perspectives of other citizens, especially local stakeholders.

Hearing the voices of other citizens, especially ones with whom you disagree, is critical to a healthy democracy. Far too often today in our country, we hear only those with whom we agree. And equally troubling, citizen participation in public controversies is often limited to membership in an interest group. While serving a valuable role in representing one side in a controversy, sometimes interest groups tend to force participants to polarized positions, rather than to positions of finding common ground. Such polarization often demonizes the opposition, and an attitude develops among citizens that controversies are about good and bad people, black and white issues, and one side winning, one side losing. This dualistic perspective of winners and losers often ensures another cycle of controversy. And while at times the resolution of a controversy may result in one side winning or losing, there are other times that finding common ground is the better resolution. Ron Brunner, a scholar of the environmental battles and participant in the first year of this initiative, describes the effort to find common ground in public lands disputes in his essay that follows as part of the foreword.

For me, the moment that crystallized the notion of finding common ground

happened when we traveled north of the Park to Paradise Valley to talk with a rancher, Martin Davis, about the wolf reintroduction issue. Davis, a fourth generation rancher in the Valley, invited faculty participants to his ranch to discuss the wolf reintroduction. As we sat with him looking out over the Paradise Valley, Davis described the impact of wolves: more time spent in the high country protecting the herd, while other ranch operations suffer; calves sent to market weighing a 100 pounds less than before wolves; and a host of other negative consequences for him and his family's ranching operation. Davis is a charismatic man whose descriptions of the consequences of reintroduction provided both texture and nuance to our previous discussion. Early the next morning, I was sitting quietly by myself in the Mammoth Hot Springs dining room, having breakfast. A faculty member from the outing the day before joined me. "I want to tell you something," she said with some intensity. "I've been thinking about our trip yesterday to Paradise Valley. I still want wolves in Yellowstone National Park." I was a bit perplexed, not knowing exactly how to react. "But," she went on, "I'll never be able to think about wolves without also thinking about Martin Davis and his family." I smiled and said: "I think that's ok."

There are clearly times when strong positions have to be taken, and bad ideas beaten back. There are venal, corrupt and self-serving interest groups which have to be challenged. However, I also believe that if we spend our political lives at the extremes, we lose opportunities to hear one another, listen to new ideas, learn from one another, and sometimes truly find common ground. The faculty member's comment brought the importance of hearing all sides and struggling to find common ground into focus. The surprising common ground found in the wolf controversy serves as an instructive example. Ranchers and wolf advocates, defended by their special interest groups, started as mortal enemies. For 30 years, they battled with environmental impact statements, lawsuits, congressional actions and many other political weapons. The issue seemed to be unyielding, with one side winning on battle, then the other side reversing the victory with their own success: There seemed to be no resolution in sight. Finally, Defenders of Wildlife, in a bold conciliatory move, acknowledged that they simply couldn't advocate for wolves without taking into account the impact wolf reintroduction would have on ranchers and their families. To back this statement up with action, Defenders of Wildlife proposed a wolf reparation fund, for which Defenders would raise money to compensate stockmen for wolf predation losses. While

that mechanism hasn't proven to be perfect, it started moving two disparate sides back towards the middle.

The search for common ground continues over wolf issues today. As ranchers and environmentalists began to talk, they realize that while they had profound differences in background and perspective, they shared a deep love of the land. If ranchers are not successful, they will sell their land to developers and this will mean that large tracts of land, open spaces and migratory routes for wildlife will be lost. In their place, small parcels of land will be developed into "ranchettes," threatening the entire ecosystem. The process of listening to and learning from one another creates innovative possibilities never before considered. In some places, in fact, ranchers and environmentalists are developing new models that allow economic activity to coexist with the protection of open spaces and healthy ecosystems.

As I watch faculty grapple with these enormously complex issues, I realize that the real impact that we are seeking is not on ourselves as participants in the seminar but on our students as the next generation of citizens, participating in the great questions of our democracy. This monograph is a testimony to the creativity and imagination of many of our faculty participants who have transformed the experience in the Stewardship of Public Lands seminar into ideas, course materials, teaching strategies and programs. I am enormously proud of and impressed with the work of these faculty members. Through their efforts, I am more hopeful than ever that we can pass along to the next generation the commitment to be engaged in the endless quest to create, in the hopeful words of the Preamble to the Constitution, "a more perfect union."

> Those who won our independence believed . . . that the greatest menace to freedom is an inert people; that public discussion is a political duty; and that this should be a fundamental principle of the American government.
>
> —Justice Louis Brandeis, 1927

Finding Common Ground

Ronald D. Brunner

Polarization on national issues has become the norm in American politics. Some politicians and pundits seeking support from the public find it more expedient to attack the other side on an issue than to compromise; the other side finds it necessary to counterattack to hold their own. Journalists report such conflicts as news, such news attracts public attention, and public attention, in turn, encourages another round of attacks and counterattacks. The overall effect, whether intended or not, is to polarize the opinions of an aroused public, often leading to gridlock on national policy. Below the threshold of national attention, however, many Americans have been finding common ground on local and regional issues in the communities where they live, work and study. Finding common ground is an aspiration that animated the American Association of State Colleges and Universities' (AASCU) American Democracy Project (ADP), including its Stewardship of Public Lands initiative that began in 2005. But what is common ground? How can we find it? And what difference does it make to the students and faculty served by AASCU?

Participants travelled throughout the park and to nearby communities in this Yellowstone Association bus.

Consider this example of finding common ground. In December 1994, a working consensus on a U.S. Fish and Wildlife Service (FWS) program to recover endangered fish populations in the upper Colorado River basin blew up because of insufficient progress. This triggered a crisis for interest groups dependent on the program and the limited water supplies available: environmental groups; competing water-user groups representing irrigation, industrial or municipal interests; and state and federal agencies with

various mandates and jurisdictions, all subject to the Endangered Species Act and other policies. Instead of seeking litigation or legislation, however, representatives from all of the major interest groups began meeting monthly in August 1997 to negotiate the issues. They focused on management of prime habitat for the endangered fish, the 15-Mile Reach of the Colorado River upstream from Grand Junction, Colorado. They succeeded in reaching agreement on a Programmatic Biological Opinion (PBO) issued by the FWS in December 1999:

> The PBO prescribed increased water flows to the reach to benefit endangered fish species at critical times, development of as much as 120,000 acre-feet of new water, and other management actions. . . . The PBO also reduced uncertainty about the regulatory environment for all concerned, despite acknowledged scientific uncertainties about the needs of the endangered fishes. Essentially, the participants agreed to monitor the responses of fish populations to the recovery actions prescribed in the PBO, to "let the fish tell us" whether those actions were sufficient to meet recovery goals, and to adapt water depletions and recovery actions accordingly.[1]

In short, the PBO served the common interest of the diverse interest groups involved. For that reason the groups have not exercised legal rights to challenge the PBO in court. Their joint support was essential for implementing the management actions, securing appropriations from Congress for necessary infrastructure, and diffusing the 15-Mile Reach case as a model for adaptation for recovery of endangered species in other Western river basins.

As this example and many others suggest, the common ground sought is the common interest. "In the simplest terms, the common interest is composed of interests widely shared by members of the community. It would benefit the community as a whole and be supported by most community members, if they can find it."[2] This refers to a place-based community—local, regional, national or even global in scope—delimited by relatively high levels of interaction among its diverse members. The common interest is not equivalent to any single interest in the community, such as economic

production or employment or environmental protection, although priorities differ among community members. An environmentalist typically has some interest in jobs and production even if environmental protection is the priority; and an employer or employee also depends on a clean environment even if their priorities are economic. Those who pursue any single interest without regard for collateral damage to the other interests involved are puritans or fundamentalists.[3] They transform legitimate interests into special interests, which by definition are contrary to the common interest. The common interest depends on integrating the multiple, diverse interests of community members, if possible, or balancing them when necessary. Integrating means a "win-win" outcome in which all groups get essentially what they want, as in the case of the 15-Mile Reach. Balancing means a compromise that leaves each group with gains and losses that are generally acceptable. In contrast, polarization means that a gain by one side is a loss by the other side, and vice versa. Perhaps wolf recovery in Greater Yellowstone is a case in point.


Yellowstone National Park.

There are complications in assessing the common interest, of course. Most importantly, the common interest cannot be taken as given or assumed, because the interests of people differ across communities and are subject to change as events unfold in any particular community. Thus it is always relevant to ask, "What are the interests of people in *this* community at *this* time?" Furthermore, any interest may be discounted if its value demands are inappropriate according to more basic community values. For example, demands for zero tolerance, taken literally, reject all but one interest and rule out the compromises often necessary to make democracy work. Any interest may be discounted if matter-of-fact expectations supporting the demands are not valid according to the evidence available. For example, despite demands to include all those affected by a land-use decision in making that decision, it is not possible to include them all if they are numerous and widely scattered, or incompetent or indifferent on the issue.[4] Moreover, conflicting claims

about the common interest in a major issue are typically resolved through "politics," defined functionally as the giving and withholding of support in making important decisions. Politics in this sense are often necessary to advance the common interest, even though abuses by special interests have given politics a bad reputation. Sound science is rarely an effective substitute for politics in reaching consensus. Indeed, on major issues interest groups often recruit their own scientific experts to buttress their conflicting demands. Despite such complications, policy practitioners have been able to advance the common interest in many particular contexts, including the 15-Mile Reach.[5] And ordinary citizens have been able to recognize the special interests involved in bribery, bid rigging, kickbacks and other obvious forms of corruption.

Finding common ground as a policy goal can be justified in many ways. For environmentalists, an authoritative justification is Aldo Leopold's land ethic:

> All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts. His instincts prompt him to compete for his place in that community, but his ethics prompt him also to co-operate (perhaps in order that there may be a place to compete for). The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land.[6]

Note that humans are parts of "the land" in this sense. "When any part lives by depleting the others," as special interests do, "the state of health is gone."[7] The American political tradition rejects in principle the arbitrary, a priori exclusion of any particular interest. The Declaration of Independence proclaims that "all men are created equal" in terms of rights, not just those who side with one faction or another. The First Amendment to the Constitution protects "the right of the people peaceably to assemble, and to petition the Government for a redress of grievances." Similarly, in the United Nations' Universal Declaration of Human Rights, "Everyone has the right to take part in the government of his country, directly or through freely chosen representatives."[8] We cannot legitimately claim our own rights to participate and be heard and then deny equal rights to others.

How can we find common ground? Americans are accustomed to depending on markets and governments, especially the federal government, and with good reason: both have served the common interest under many circumstances, despite their limitations. For example, in a competitive market, the pursuit of economic self-interest can serve the interest of society through the celebrated "invisible hand" of Adam Smith. But economic self-interest also can produce negative externalities to the market, including depletion and pollution of the natural environment on which humans and other species depend. In American government, the separation of powers institutionalizes conflicts to curb the excesses of factions. "What is missing, because the framers did not provide for it, is a constitutional process for readily resolving these conflicts." This is one factor in "the new American political (dis)order," as democratic theorist Robert Dahl called it, characterized by more fragmentation and less representative and deliberative public opinion.[9] Long ago, Aldo Leopold noted private ethics and other requirements for conservation of the land that lie beyond the powers of government. He suggested self-government as a possible solution to problems of land abuse: "I do not here refer to such superficial devices as advisory boards, who offer their wisdom to others, or such predatory devices as pressure groups, who exist to seize what they can. I refer rather to social and economic units who turn the light of self-scrutiny on themselves." The functions of government, he concluded, "will become real and important as soon as conservation begins to grow from the bottom up, instead of from the top down, as is now the case."[10]

Community-based initiatives like the one focused on the 15-Mile Reach are consistent with Leopold's vision of self-government within the established structures of governance and partially compensate for the missing piece in the constitutional process. Such initiatives have emerged in recent decades in response to otherwise intractable conflicts over public lands and other natural resources in the American West. In general, a community-based initiative is:

> . . . composed of participants representing quite different interests who interact directly over a period of time, in an effort to resolve an issue in the place where they live. Within the broader context of established structures of governance...the small scale and issue focus of a community-based initiative open

> up new opportunities for participants to balance or integrate their interests into policy that advances their common interest.[11]

The small scale allows for frequent and informal person-to-person contacts that sometimes break down negative stereotypes of the other side and build trust if not friendship. A forest ranger in the Carson National Forest in northern New Mexico did this beginning with "horseback diplomacy;" he and his Forest Service staff visited traditional Hispanic users of the forest in their homes to understand their grievances and needs for improvement of forest management in the Camino Real district. For consensus on the factual basis of a problem, he insisted that contending groups visit the site of the problem together as a precondition for meetings.[12] In comparison, courts are handicapped by formal adversarial procedures and higher costs. Legislatures facing many big issues can rarely afford to focus on a small-scale issue over a long period of time.

The early community-based initiatives often emerged from crises in which contending persons and groups could no longer tolerate the status quo, and could find no better alternative than to sit down and negotiate face-to-face. For example, in northern California a precipitous drop in timber revenues threatened termination of essential parts of local government (the sheriff's office, a clinic and public schools), forcing the Plumas County Supervisor in November 1992 to call a local environmental lawyer who had blocked timber sales in court. "'All right, we're through,' [the supervisor] said. 'We've got to do something new. Will you meet with the mill owners?'"[13] Thus began the Quincy Library Group (QLG), so-called because it met in the Quincy town library. QLG negotiated a Community Stability Proposal that was overwhelmingly endorsed by local government, environmental, timber and other interests in a town meeting in July 1993. Forest Service officials in surrounding national forests rejected the proposal as interference in established forest management practices. National environmental groups opposed the proposal in part because they considered QLG a threat to established structures of governance. Congress nevertheless mandated implementation of the Community Stability Proposal as a pilot program in October 1998; the legislative history includes a 429-1 vote for it in the House of Representatives. Enough initiatives have made sufficient progress in finding common ground for local groups in less dire circumstances to adapt

proven practices to the resolution of new problems—sometimes collaborating with employees of federal land management agencies on the ground, who typically accepted some career risk by collaborating.

More recently, the land management agencies themselves have encouraged community-based initiatives, which they call "collaborative efforts." A recent report by the U.S. Government Accountability Office (GAO) reviews some steps taken; its subtitle proclaims that more *Opportunities Exist to Enhance Federal Participation in Collaborative Efforts to Reduce Conflict and Improve Natural Resource Conditions.*[14] GAO noted that participants in collaborative groups "may learn to appreciate each other's perspective by focusing on interests they have in common. Experts have noted examples in which environmentalists learned to appreciate ranchers' needs to earn a living through grazing livestock, timber companies acknowledge the value of healthy ecosystems, and federal agency technical experts recognized the importance of traditional knowledge in land management practices."[15] GAO reported that the structure and process of collaborative efforts may differ according to circumstances. However, certain common practices contribute to their effectiveness but do not guarantee success (neither do market or government practices guarantee success). GAO's list of common practices is representative and broadly consistent with other "how to's" found in the literature cited in the report's bibliography:

- Seek inclusive representation;
- Develop a collaborative process;
- Pursue flexibility, openness and respect;
- Find leadership;
- Identify or develop a common goal;
- Develop a process for obtaining information;
- Leverage available resources;
- Provide incentives; and
- Monitor results for accountability.[16]

Case study narratives are necessary to clarify such formulas for finding common ground, and to suggest a broader range of specific practices that might be adapted for the situation at hand. For example, the horse might be deleted from horseback diplomacy to initiate collaboration in an urban

neighborhood. Appendices to the GAO report provide narratives on seven collaborative resource management efforts. For each effort, Table 1 in the report summarizes the "Natural resource problem" and the "Common interest solution."[17]

This brief review of finding common ground brings us back to the third question raised earlier. What difference does it make to the students and faculty served by the American Democracy Project? We have plenty of opportunities to learn and teach democracy in practice, supported by a rich literature on the experience of community-based initiatives and collaborative efforts. Some participants in the Stewardship of Public Lands initiative have focused on problems in Greater Yellowstone or other public lands. Others have focused on problems of land use closer to home. Still, others may choose to engage local variants of national problems, such as needs for energy conservation, development of renewable energy sources, reducing vulnerability to climate change, controlling health care costs, improving public schools and so on. Each local variant is more tractable, analytically and politically, than the national problem. Each falls within Leopold's inclusive concept of the land, and is relevant to his vision of building from the bottom up. And there is some support from the top down. Consider Representative David Obey's (D) remarks on the floor of the House of Representatives in June 2004:

> I have seen intractable differences on forestry matters in my own area resolve themselves in six weeks when people are legitimately willing to sit down, deal with each other in an honorable fashion, and recognize that each side has legitimate interests. And I think we have a right as legislators to go to groups on both sides of this issue and say, we have had it, fellows. Get together. Work it out. . . . But these days, we have polarization, polarization and polarization on every blasted issue that comes before this House.[18]

Perhaps by getting together and working it out with our neighbors we can do our part as scholars and citizens to mitigate polarization in national politics and advance our common interests.

Endnotes

[1]Lindy Coe-Juell, "The 15-Mile Reach: Let the Fish Tell Us," in Ronald D. Brunner, Toddi A. Steelman, Lindy Coe-Juell, Christina M. Cromley, Christine M. Edwards, and Donna W. Tucker, *Adaptive Governance: Integrating Science, Policy, and Decision Making* (New York: Columbia University Press, 2005), pp. 47-90, at pp. 47, 49.

[2]Ronald D. Brunner, "Problems of Governance," in Ronald D. Brunner,, Christine H. Colburn, Christina M. Cromley, Roberta A. Klein, and Elizabeth A. Olson, *Finding Common Ground: Governance and Natural Resources in the American West* (New Haven, CT: Yale University Press, 2002), pp. 1-47, at p. 8. For more on the common interest, see pp. 8–18 and the literature cited therein; and Brunner et al. *Adaptive Governance,* pp. 9-11, 277-284.

[3]For teaching material on this point, see Richard A. Shweder, "Puritans in High-Top Sneakers," *New York Times* (September 27, 1993), p. A13; and A. N. Wilson, "The Good Book of Few Answers," *New York Times* (June 16, 1998), p. A31.

[4]For a critique of the principle of affected interests, see Robert A. Dahl, *After the Revolution?* (New Haven, CT: Yale University Press, 1970), pp. 64-67. This principle was an issue in Christine H. Colburn, "Forest Policy and the Quincy Library Group," in Brunner et. al., *Finding Common Ground,* pp. 159-200, at p. 192.

[5]See Colburn, "Forest Policy and the Quincy Library Group," and other cases and literature cited in Brunner et al., *Adaptive Governance.*

[6]Aldo Leopold, *A Sand County Almanac: And Sketches from Here and There* (New York: Oxford University Press, 1989), pp. 203-204.

[7]Aldo Leopold, "Land Use and Democracy," *Audubon* 44 (September-October 1942), pp. 259-265, at p. 265.

[8]From Article 21. Adopted by General Assembly Resolution 217 A (III) in December 1948, the Declaration can be accessed at un.org/Overview/rights.html. Article 2 provides that "Everyone is entitled to all the rights and freedoms set forth in this Declaration without distinction of any kind such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status."

[9]Robert A. Dahl, *The New American Political (Dis)Order* (Berkeley, CA: Institute of Governmental Studies, University of California, 1994), pp. 1-5.

[10]Leopold, "Land Use and Democracy," pp. 264-265.

[11]Brunner, "Problems of Governance," p. 7.

[12]Toddi A. Steelman and Donna W. Tucker, "The Camino Real: To Care for the Land and Serve the People," in Brunner et al., *Adaptive Governance,* pp. 91-130.

[13]Colburn, "Forest Policy and the Quincy Library Group," p. 168.

[14]U.S. Government Accountability Office (GAO), *Natural Resource Management: Opportunities Exist to Enhance Federal Participation in Collaborative Efforts to Reduce Conflict and Improve Natural Resource Conditions* (GAO-08-262, February 2008), available through GAO's Web site (gao.gov).

[15]Ibid., p. 20.

[16]Each is quoted from ibid., pp. 21-23, where they are presented in bold-faced type and elaborated with text. The Bibliography, ibid., pp. 120-133, covers the literature on collaborative efforts in natural resource management in the United States.

[17]Ibid., pp. 27-28. For suggestions on action alternatives, see Brunner et al., *Adaptive Governance,* pp. 284-294.

[18]Remarks of Congressman David Obey (D-WI), ranking member of the House Appropriations Committee, from the *Congressional Record* (June 16, 2004), p. H4259.

Natural Resource Economics and Public Choice: Conflicts Over Land Use in Yellowstone National Park

John Conant and Charles Amlaner

Abstract—The workshop described in this chapter provides secondary teachers with knowledge, pedagogy and curriculum materials necessary to enhance classroom instruction concerning the economic, political and scientific concepts fundamental to issues surrounding the economically efficient use of public land. Four key social and natural science issues of public land usage in Yellowstone National Park (YNP) are used to illustrate these concepts: (1) American Bison migrating outside YNP boundaries and potentially contaminating free ranging cattle with brucellosis; (2) recreation vs. preservation—the appropriate mix of recreational use and preservation of natural resources within the park; (3) bio-prospecting and geothermal energy—the use of Yellowstone's unique geothermal features for commercial purposes; and (4) wolf reintroduction, management and protection of private livestock herds. In addition to this book's companion Web site, extensive background information and resources on the workshop are provided at indstate.edu/publiclanduse/index.htm.

Introduction

The goal of the workshop described in this chapter is to provide secondary social studies and life science teachers with the knowledge base, up-to-date pedagogy, and curriculum materials necessary to enhance their classroom instruction concerning the economic, political and scientific concepts fundamental to issues surrounding the economically efficient use of certain types of public land. Participants are introduced to both the science and social science concepts necessary for understanding public land use issues. The workshop utilizes several issues of public land usage in Yellowstone National Park to illustrate the basic concepts of Environmental Economics and Public Economics. These issues include the free roaming of Yellowstone National Park (YNP) bison, many of which carry the disease brucellosis off park lands during the winter, which

puts privately owned cattle and sheep herds at risk. Over the past two years, both Montana and Wyoming have lost their "brucellosis free" status, which has put an added stress on the cattle industry (Montana's News Station & Cordillera Communications, 2008). The reinstitution of wolves to the park, along with their endangered species classification, is also considered in this workshop. Restrictions placed on different kinds of recreation in the park, with special emphasis on winter use by recreational snowmobiles and snow-coaches, and issues regarding bio-prospecting in the park's geothermal areas are also examined.

Participating teachers explore how the groups involved in these controversies express their interests and how land management issues are resolved in our democratic system. The role of individual citizens in the formulation and execution of public policy is emphasized. By observing the resources that are in dispute and talking personally with all the advocacy and stakeholder groups involved, participants gain firsthand insight into the public policy making process. Personal observation of the resources, seeing the alternatives, studying the primary and secondary effects of policies—both economically and environmentally—and speaking personally with the individuals whose lives are directly impacted provides a much better understanding of the issues involved. It also allows the teachers direct experience from which to bring not only the concepts but also the effects of the decisions on real people's lives, into their classrooms. The understanding generated helps these teachers convey the importance of knowledgeable participation in the democratic process into their classrooms in a manner not possible without experiencing these public choice processes up close and personally.

A bison crosses one of the roads in Yellowstone National Park.

In addition to the discussion of various concepts, conversations are held on how to teach these ideas in the secondary social studies and science

classrooms. The link between the concepts/lessons and the Indiana Academic Standards is emphasized during all of these discussions. In the following pages, the basic features and organization of our workshop are highlighted.

Content and Curriculum

Indiana Academic Standards for the Social Studies (2008)

In order to meet the challenges of a rapidly changing world, Indiana has created a set of academic standards to guide teachers in helping their students acquire the skills and knowledge they need to be successful. These standards outline what students need to know and be able to do at each grade level. They can be found on the Indiana Department of Education's Web site at doe.in.gov/.

At the high school level, Indiana's academic standards for social studies provide content and skills for specific courses that focus on one of the four content disciplines that make up the core of the social studies curriculum: history, government, geography and economics. One of these content disciplines is the major focus of each course while the other areas play supporting roles or become completely integrated into the course content. Each course is expected to develop skills for thinking, inquiry and research, as well as participation in a democratic society.

Our workshop on conflicts over land use in YNP provides interesting, real world examples for teaching the concepts imbedded in five of the eight Indiana Academic Standards for High School Economics, including the standards on scarcity and economic reasoning (Standard 1), supply and demand (Standard 2), market structures (Standard 3), the economic role of government (Standard 4) and the benefits of trade (Standard 8). Meetings with the experts and advocates on each side of the issues also provides participants with insight into the concepts imbedded in three of the five Indiana Academic Standards for U.S. Government, including the nature of politics and government (Standard 1), the purposes, principles and institutions of government in the U.S. (Standard 3) and the roles of citizens in the U.S. (Standard 5).

Three indicators of what students should know and be able to do upon finishing high school—from Indiana's U.S. Government Standard 5 regarding the role of citizens—are central to the work of the project and are at the heart of the goals of the American Democracy Project. These indicators require that students demonstrate the skills needed for effective democratic participation. To accomplish this standard, students are taught the "importance of citizen action that monitor and influence" government as "individuals and members of interest groups." In turn, students use information from a variety of sources to "describe and discuss American political issues such as environmental issues" and to develop a better understanding of the "opportunities available to individuals to contribute to the well-being of their communities and to participate in the political process" at all levels of government (see Indiana Department of Education, 2008).

Indiana Academic Standards in the Sciences (2008)

Indiana's high school science standards specify two primary content components: principles and historical perspectives. The disciplinary-based concepts provided within each principle form the focus of a particular science course (e.g., general biology, life science, ecology). Supporting themes common to all secondary science courses include: (1) the nature of science and technology, (2) scientific thinking, (3) mathematical processes, and (4) common themes including systems and modeling approaches which transcend typical disciplinary boundaries and prove fruitful in explaining theory in laboratory experiments and field observations. These four supporting themes enable students to understand that science, mathematics and technology are interdependent human enterprises, and that scientific knowledge and scientific thinking serve both individual and community purposes (see Indiana Department of Education, 2008).

Conflicts over land use in YNP also provide many interesting real world applications for teaching the natural science concepts embedded in Indiana's High School Academic Standards in the Sciences. Various controversies involving Yellowstone, such as wolf reintroduction, can be used to address the "concepts, principles and theories that enable (students) to understand the living environment" as they "investigate, through . . . fieldwork, how

living things function and how they interact with one another and their environment" (Biology: Standard 1-Principles). Investigating the park's animals central to these conflicts allows students to understand how organ systems are developed and maintained in order to fight disease and parasites (Life Sciences: Animal Standard 3). Understanding the brucellosis issue requires knowledge of the history of the bison in the park and the "importance of genetic information . . . evolutionary forces and the theory of genetic diversity through the past, present and future . . ." (Life Sciences: Animal Standard 4).

Studying how wolves have affected Yellowstone's ecosystem, particularly their impact on the population of aspen in the park, helps address the content of Life Sciences: Plant and Soil Standard 5: "Understanding that there are a variety of factors that contribute to the development and survival of plant species. Success of survival may depend upon breeding programs, environmental factors and genes."

Student fieldwork in Yellowstone directly addresses many of the concepts in both of the Environmental Science Standards (1-Principles and 2-Historical Perspectives). During their time in the park, for instance, participants investigate the concepts of "environmental systems, flow of matter and energy, populations, natural resources and environmental hazards" (Standard 1). All of the issues investigated have long histories in the park, which illustrate very effectively "how the scientific enterprise operates through examples of historical events. Through the study of these events, they understand that new ideas are limited by the context in which they are conceived, are often rejected by the scientific establishment . . . and grow or transform slowly through the contributions of many different investigators" (Standard 2).

A large number of concepts from the natural and social sciences (summarized in Table 1) are emphasized during the workshop lectures and discussions, both on campus and at Yellowstone.

Various teaching and learning pedagogies are also utilized during the workshop. Students view video clips—"John Stossel's Teaching Tools," a series by ABC News, and video shot during the pilot workshop in

Table 1: Academic Concepts Taught in the Course		
Science Concepts	**Government Concepts**	**Economic Concepts**
Nature and impact of science	Civic and political life	Economic way of thinking
Role of critical scientific thinking	Meaning of citizenship	Market process
Ecosystems integration and management	Roles of citizens in the U.S.	Cost/benefit analysis
Influence of social systems on the environment	Rule of law	Property rights
Natural selection and adaptation	Social diversity	Economic efficiency and equity
Global warming and climate change	Justice and equality	Economic regulation
Systems homeostasis and equilibrium	Principles of American democracy	Basic principles of supply and demand
Natural resource management	Values of American democracy	Market failure
Natural and unnatural resource recycling	Functions of federal, state and local governments	Government failure
Role of earth hazards, disasters and consequences	Functions of departments of executive branch of government	Tragedy of the commons
Disease in plant and animal populations	Role and workings of special interest groups	Special interests and logrolling
Renewable and nonrenewable energy resources	Influence of media on public opinion and policy	Economic role of government
Population dynamics	Civil rights	Public goods
Role of politics in natural resource management	Constitutional rights	Public choice analysis
Earth history, plate tectonics, volcanism, geothermal processes	Relationship between limited government and a market economy	Entrepreneurship
Historical perspectives of ecosystem management	Historical perspectives on government and public lands	Historical perspectives on economic systems and institutions

2008—that illustrate scientific and social science concepts. Films are used to introduce YNP, its resources and the land usage issues the participants study at the park. A significant number of student participative lessons are discussed and demonstrated by experienced, "master" teachers. Simulation and role-playing exercises are utilized during the workshop to help students understand the broad perspectives of various advocacy groups engaged in the issues at Yellowstone.

Conflicts Over Land Usage

The course is designed to analyze the social and natural science aspects of four conflicts over land usage that have been disputed for many years. The four issues are:

1. American Bison (and to a lesser extent elk) migrating outside YNP boundaries and contaminating free ranging cattle with brucellosis.
2. Recreation vs. Preservation: What is the appropriate mix of recreational usage (who, what, when, how much) and preservation of natural resources within the park? Focus on winter usage, but also take up peak-seasonal conflicts.
3. Bio-Prospecting and Geothermal Energy: Property rights and using YNP as a source of micro-organisms (mining new thermophilic species) and its unique geothermal features for local energy.
4. Wildlife Management: Wolf reintroduction, management strategies, restrictions, protection of private cattle/sheep herds, hunting, etc.

Advocacy Groups and Stakeholders

In order for participants to understand the public policy making processes of American democracy, it is essential that they see and hear about the issues from all relevant stakeholders. Workshop participants listened to first-hand experiences as recounted by each stakeholder in the four conflict areas. They engage the stakeholders in direct conversation about the importance of the issues to them and the strategies they employ to influence public decision-making. During their visit to YNP, the participants speak to representatives of the following groups:

- **Business Groups:**
  - Hotel owners and snowmobile providers/guides
  - Outdoor recreation companies (rafting, fishing, hunting, touring, horseback, etc.)
- **Environmental Groups:**
  - Mainstream: Northern Plains Resource Council or the Yellowstone Center for Resources
  - Activist: The Buffalo Field Campaign
- **Resource Experts:**
  - Large animal veterinarians (Department of Livestock – Mont. or Wyo. or local DVM)

- Department of Natural Resources (Fish and Wildlife – Mont. or Wyo.)
- Montana State University Center for Bio-Prospecting
- National Park Service biologists and administrators

■ **Local Stakeholders:**

- Ranchers
- Politicians
- Native Americans

Workshop Partners and Their Roles in the Project

One of the unique characteristics of this project has been the number of partners that have collaborated to make the experience possible. Indiana State University (ISU) faculty and administration (i.e., the Center for Economic Education, the department of biology, the American Democracy Project, and the Center for Public Service and Community Engagement) help fund, plan and implement the on-campus portion of the workshop, plan and implement the follow-up workshop, and provide classroom visitation to participants when they teach the lessons they created for the workshop in their own high school classrooms. The Indiana Council for Economic Education provides help with workshop planning and offers tuition compensation for the economic graduate credit provided to workshop participants. The Indiana Department of Education provides workshop presenters and substitute pay reimbursement for the teachers at the follow-up workshop. The Vigo County and Lafayette School Corporations help with planning and recruiting; each corporation formed a four-member team of teachers to participate in the workshop held in June 2009. The American Association of State Colleges and Universities (AASCU) provides help with the "Democracy in Action" portion of the workshop through the American Democracy Project's Stewardship of Public Lands initiative, and finally, the Yellowstone Association coordinates the workshop field itinerary, schedules presentations and interviews with experts and advocates, provides classroom space, transportation and a wildlife expert while at YNP.

The Expected Outcomes and Potential Impact of the Project Activities

The workshop was designed to provide a conceptual foundation in the natural and social science concepts necessary to fully understand the conflict issues at YNP. The secondary teacher participants were also provided with a number of methods and instructional strategies for covering these concepts with their students. An initial weeklong classroom "pre-trip" workshop was held at Indiana State University, where a rich assortment of YNP-focused content was presented, including lectures on economics, public land management, biology and geology. That week was immediately followed up with a weeklong field experience at YNP. Daily reflection writing was a significant component of the classroom and field experiences. After returning from the field experience, participants developed lesson plans and materials for the presentation of environmental and public economics lessons using YNP issues. These lessons are delivered in the participants' secondary science or social studies classrooms. One of the course requirements calls for a workshop leader to observe each participant teach the lesson they create during the workshop. This experience is the topic of a daylong follow-up workshop held at ISU the following academic year. Each participant describes their lesson presentation experience to the group, discusses what worked well and what did not, and the group then discusses ways to make the lessons more effective. During this follow-up workshop, the leaders also share ideas with participants about how to access additional funding or resources to support the teaching of environmental economic and public choice concepts. The pilot agendas are included in Appendices A and B. A sample lesson plan featuring each of the four issues from lessons created by three of the workshop participants is included in Appendix C, and a listing of films that introduce the issues at YNP is included in Appendix D. (These appendices are located on this book's companion Web site at adpstewardshipresources.pbworks.com).

Teaching methods that will help students learn how economic and political decisions are actually made in the United States concerning controversial issues, such as the public land use in YNP, are also emphasized during the workshop. Presentations are designed to enable and motivate participants

to present these important economic, governmental and scientific concepts within a context of policy issues that their students will find interesting and relevant. Participants' students will understand that democracy and political engagement mean more than merely voting. Evidence of the effectiveness of using public policy issues from YNP to enhance the interest and understanding of the covered academic concepts is illustrated through additional teacher reflections written both immediately after their field experience and after they have presented their lessons in their classroom.

Professional Development Relations between Higher Education and Secondary Faculty

Workshop leaders have intentionally developed a model of professional interaction between higher education faculty and secondary teachers in order to bring together the unique array of abilities and expertise representative of the inherent training behind each group. This partnership further provides a foundation for facilitating the introduction of other social and natural science content and skills over a variety of issues that can be investigated in this kind of field research/learning experience for middle and high school students.

A major challenge for all secondary teachers is introducing academic concepts in ways their students will find both interesting and meaningful. By bringing together representatives from higher education, the public sector and constituency groups, teachers will be better equipped to help their students investigate the complexity of the modern scientific and social issues that they will face as participative citizens. As the secondary teachers developed strategies for introducing these concepts into their classrooms, they also cemented a relationship to the faculty at Indiana State University.

The longer-term goal of the project is to create a deeper partnership between the higher education faculty and the secondary teachers. This relationship would involve mentoring, professional development, and sharing concept and local issue expertise. One of the innovative aspects of this partnership is the creation of teams of higher education, high school and middle school teachers. These teams are envisioned to work together in the development of ongoing "professional, research-oriented, field-based projects" involving not only university faculty and students, but also middle school and high school teachers and students. Ideally, the team would be designed to bring together

science and social science teachers from a middle school that feeds into the high school, so that participating students would be able to continue with this professional research project through their later middle school and early high school years.

The first stage of the project involves the teachers at each level working together to create a field experience and design and test the supporting curricular materials. The second stage involves a field experience that would include a few specially selected students (university, high school and middle school) and would utilize the materials developed during this stage. The goal is to choose students who are capable—but not necessarily motivated—in order to show them the "real life" work that social and natural scientists do and, thus, create interest where none previously existed. The secondary teachers who participated in workshops are encouraged to work with higher education faculty to develop this kind of field-based work for their own students. These students, in addition to learning the concepts, would be prepared to serve as peer leaders during the third stage of the ongoing project. In the third stage, the team takes students into the field to begin experiencing what it is that professional practitioners do and to learn the scientific and social science concepts (as well as the aspects of democracy or citizenship in action) involved in the issues being investigated. The ongoing nature of the project is evidenced by degree of student enthusiasm and continued participation in the project over several years of their secondary school experience, along with tangible outcomes in the form of presentations, papers, debates, etc. The teams could work with different issues each year in order to keep the project new and interesting for both students and teachers.

References

Indiana Department of Education. *Indiana academic standards* [Data file]. Available from dc.doe.in.gov/Standards/AcademicStandards/index.shtml

Montana's News Station and Cordillera Communications. (2008, June 18). Auction owner: brucellosis could affect the bottom line. Retrieved from montanasnewsstation.com/global/story.asp?S=8454132

The Yellowstone Experience: A Reflection Based on Three Stockton Courses

Tait Chirenje and Lisa Honaker

Abstract—Three professors from the Richard Stockton College of New Jersey taught three different courses with common stewardship elements in the General Studies curriculum in 2008. The common elements included: winter use (snowmobiling), bison and elk management, wolf and bear management, and climate change in the Greater Yellowstone Ecosystem. Students had the option to participate in a culminating field experience in which they would engage with different stakeholders on these issues in Yellowstone National Park in January 2009. Twenty-one students and faculty went on the trip. Students reported that they got a clearer appreciation of the issues they had studied while they were still in New Jersey through direct engagement and meetings with stakeholders. The professors are modifying this experience, including playing a greater role in the educational plan for the stay at the park, as well as increasing the number of joint seminars for students in the three courses.

Introduction

In the fall of 2008, three faculty members teaching three undergraduate courses—each in different disciplines and with distinct foci—cooperated in an experiential learning trip to Yellowstone National Park (YNP). Their common purpose was both substantive (environmental stewardship) and thematic (sociopolitical engagement). Each of their courses thus allowed for common content and skill elements to be addressed, enabling students in each course to participate in a common experiential program in YNP. The common content elements included general natural resource management; wildlife behavior and management; public land management and policy; and elements of public policymaking and socioeconomic conflict. Common skills included general critical thinking, quantitative reasoning, information literacy and writing.

The United States National Parks Service (NPS) and the United States Forest Service (USFS) present multiple opportunities to study the challenges involved in the stewardship of public lands. As sites of national importance, they allow instructors to catalyze student interest, focus on locations of national significance, and address complex elements of federalism, democratic participation and national policymaking. Such aims would be more difficult to address if a local, less auspicious destination were selected for the study trip.

At the same time, a focus on a national park allows instructors to readily identify commonalities in character between the issues and conflicts that form around national parks, in this case Yellowstone, and more local and regional environmental stewardship issues. It is clear to us that certain common elements often emerge in the political, economic and cultural dynamics that define conflicts over natural resources and environmental stewardship. The issues that different communities in different parts of the country grapple with on a regular basis are essentially the same. Only the players or stakeholders change. Patterns of contentious politics, sociocultural conflict, public mobilization, representation, interest aggregation and conflict, mediation and adjudication show striking similarities across cases. Hence, conflicts over development, water management, species management and loss, climate change, and related issues show striking similarities across the nation. Similarly, these cases offer useful examples of generalizable patterns such as conflicts over federalism, regulatory intervention, land use, regulatory takings and economic conflicts. The stakeholders commonly include farmers, commercial interests, residents, environmental advocates and federal, state or local government agencies. As a result, the study of conflicts—both local and at YNP—allowed our students an opportunity to more readily identify and evaluate these common elements and patterns, and appreciate the broader sociopolitical structures that shaped the conflicts.

Yellowstone National Park's Firehole river.

Of course, the differences between cases matter as well. In particular, differences in the level of communication and engagement among stakeholders and the character of conflict management efforts allowed our students to assess the effectiveness and value of differing policy practices and resolution approaches. The difference does not necessarily lie with individuals. Rather, it is in the mechanisms in place in these communities that either facilitate or discourage active engagement and conflict resolution. It was with this in mind that three faculty members from the Richard Stockton College of New Jersey decided to incorporate elements of stewardship in three different general education courses that all culminated in a common field trip to Yellowstone National Park in the winter. The courses were designed to incorporate the conflicts in the Greater Yellowstone Ecosystem (GYE) and address the stance of the different stakeholders and the approach taken by the responsible authorities to resolve these issues.

The courses, Natural Resource Policy (GSS3268), Argument and Persuasion: Yellowstone (GEN2121) and Man, Nature and Economy (GNM 2120), were taught by Drs. Patrick Hossay (political science), Lisa Honaker (literature) and Tait Chirenje (environmental science and geology). The topics covered in these courses exposed students to different facets of the problems from the perspectives of professors in different disciplines. Care was taken to relate the problems experienced in the GYE and the role played by stakeholders to the current issues in New Jersey.

Yellowstone National Park was chosen because of Stockton's affiliation with the American Democracy Project's Political Engagement Project, which sponsors a summer workshop for faculty on Stewardship of Public Lands at the park. Two of the faculty members involved in the collaboration, Drs. Chirenje and Hossay, participated in the summer workshops in 2007 and 2008, respectively. They were introduced to the main issues facing the GYE and met and interacted with the critical stakeholders during their weeklong stay in the park.

The intent was to define a useful balance of courses that complemented each other, while also sharing a common conceptual focus. Because communication among stakeholders—as well as the nature and content of the arguments made by them—are crucial components in tackling these

issues, Dr. Chirenje sought out Dr. Honaker to design a course that focused on analyzing and evaluating positions taken on environmental issues in New Jersey and in the GYE, as well as strategies for addressing these issues. Dr. Hossay's course was particularly focused on resource management and policy issues. Dr. Chirenje's course offered a broad conceptual introduction to the social and philosophical, as well as the scientific and political elements of environmental stewardship.

This sort of interdisciplinary three-course collaboration is generally easy to accomplish at an institution like Stockton College because of the nature of the college's academic departments and schools. The college promotes interdisciplinary course offerings and collaboration among faculty and students in different schools and departments. The college's curriculum also allows for modification in the general education and elective requirements to suit many different tracks and concentrations. This has allowed new partnerships among the political science, environmental science and geology programs that have defined an innovative new interdisciplinary program, sustainability and environmental policy, which focuses on training students as advocates and innovators in the creation of a sustainable future.

The Courses and Faculty

As discussed earlier, all three courses are part of Stockton's general education offerings. Students are required to take eight courses in this general education category. This accounts for 25 percent of the credits required for their baccalaureate degree.

Man, Nature and Economy, GNM 2120: This course was taught by Dr. Tait Chirenje (environmental science and geology, school of natural science and mathematics). It is designed to help students develop an appreciation of the impact of our economic activities (resource extraction, processing, use and disposal) on the environment. Students learned how our economic policies and the dominant social paradigm (DSP) affect our attitudes towards the environment. The goals of GNM 2120 are to enable students to: (1) analyze the relationships between current socioeconomic policies and the

way we extract, process and use our resources, as well as dispose of waste and (2) evaluate the specific impacts of resource extraction, processing, use and disposal on the environment and propose reasonable alternatives. The course covered population growth and the socio-economic system; resource extraction and use; mining and manufacture; water use and quality; food and agriculture; construction and land use; energy and air quality; and solutions.

Students read and wrote reflections on three books: *Cradle to Cradle* (McDonough & Braungart, 2002), *My Ishmael* (Quinn, 1998) and *Affluenza* (de Graff et al., 2002). Other readings included the *Park Issues 2008* publication by the Yellowstone Association and other YNP-related publications.

The class was divided into five groups of six members, and each group worked on a project of their choice. One group worked on issues affecting the Greater Yellowstone Ecosystem with the intention of participating in a field trip to Yellowstone National Park during the first week of January.

Argument and Persuasion (GEN 2121): Dr. Lisa Honaker (literature) taught this course. Its focus was on developing student abilities to recognize and construct for themselves viable and persuasive arguments on environmental issues, particularly those facing the GYE. While looking at both effective and ineffective arguments, the course focused on how the issues under consideration might be most productively addressed, debated and, perhaps, even resolved by the community confronting them. The course also sought to teach students how to identify persuasive techniques and logic, as well as how to use them in making cases about issues that mattered to them and their communities.

To drive home these goals, the course included a number of experiential components: Students participated in service-learning with local environmental organizations and attended a speaker series, Ordinary Lives of Engagement, in which local citizens discussed their own efforts to address issues of local, national and international concern. Students were also given the opportunity to participate in the trip to Yellowstone.

Required texts included *Ensuring Greater Yellowstone's Future: Choices for Leaders and Citizens* (Clark, 2008), *Preserving Yellowstone's Natural Conditions* (Pritchard, 1999), as well as documents from the U.S. Park Service's online materials on Yellowstone, and other material on environmental issues discovered through research.

Writing requirements for the course sought to unite issues and experience. Students wrote two event reviews in which they suggested how the speaker might persuade an audience of his or her position. They kept an online journal of their service-learning experience, responding to prompts that asked them to consider their organization's work, challenges and goals as they recorded their own contributions. They also wrote four position papers (one on local environmental issues, one on national environmental issues, and two on issues specific to the GYE), each of which went through a draft and a revision. Students then chose three of these papers to revise once more for inclusion in a final graded portfolio, along with a self-reflective essay in which they explored the connection between the academic and experiential components of the course.

Though only three students from this course signed up for the trip—and only two actually went—course content was unchanged. Yellowstone was, from the outset (and remained), the focus of fully half of the course.

Natural Resources Policy, GSS 3268: This course, taught by Dr. Patrick Hossay, addressed the scientific, social, political and economic factors that shape the use of, and human impact on, natural resources. In particular, the course focused on two general areas of resource management: land use and wildlife conservation and management. The course began with sessions that provided a general discussion of the basic concepts, theories and issues that frame any discussion of natural resources and environmental management. After these sessions, the course addressed multiple issues and aspects of land management in the United States, including management of national parks and public lands, mining, farming, urban sprawl, and several other dynamics that shape the use of land in the U.S. and the threats to ecological functions. Subsequently, the last third of the course addressed wildlife and species conservation issues, such as general concepts related to biodiversity and

wildlife management, as well as focused examinations of representative cases of conservation and wildlife management.

The course topics included: theories and concepts (ecological principles and sustainability, environmental ethics, environmental economics, environmental policy); land use (federal land management, forest management, extraction on public lands, rangelands and grazing, local land management and preservation, soil and agriculture, water resources and policy); biodiversity and species protection (population ecology and biodiversity, island biogeography and reservation ecology, wildlife management and economics, U.S. endangered species protection, reconciliation ecology, and community conservation); and case studies (including wolves, panthers, condors, etc.).

Participation in the Yellowstone study tour was optional, and would count as the research/service project required by the course. Roughly a third of the students choose to take part in the YNP trip.

The Yellowstone Experience

Twenty-one students and the professors from the three courses traveled to Yellowstone National Park on January 3, where they stayed for a week at the Yellowstone Association's ranch in Lamar Valley. The accommodations and educational components of the trip were taken care of by the Yellowstone Association.

The objective of the trip was to give this select group of students a clearer appreciation of the issues they had studied while they were still in New Jersey through direct engagement and meetings with stakeholders. Stockton professors and the Yellowstone Association had created an educational plan that involved meetings with stakeholders engaged in both sides of the following issues: winter use (snowmobiling), bison and elk management, wolf and bear management, and climate change.

Reflections

Student Reflections on the Yellowstone Field Experience

Both formative and summative responses from students about their experiences were very positive. Formative assessment was done informally in groups as the trip progressed from arrival to the day we left. During our last group evening session, we conducted our summative assessment in which faculty and students had an open discussion about the Yellowstone experience. The students were asked questions covering a wide range of issues including: timing (season) of the trip, accommodations, curriculum and other activities (hiking, snowshoeing, etc.).

Although temperatures dropped to -16 one night and we were staying in propane-heated cabins, this did not bother our students and the majority said they would come back under the same conditions during winter break. Students also expressed high levels of satisfaction with the hiking and snowshoeing activities arranged by the instructors from the Yellowstone Association. While acknowledging that the lectures delivered by the association's guests and instructors did not cover much new material, students were also satisfied with the lectures, finding the reiteration of issues they had studied helpful and making them feel confident enough about their own knowledge of the issues to ask informed questions. Students were particularly impressed and affected by the few stakeholders we met. Being able to talk to people whose lives and livelihoods were impacted by these issues made previously abstract questions much more meaningful for them.

When asked if they would have preferred more uniform experiences before coming on the trip, the students from the three separate courses thought that it was a plus that the group came from different disciplines and perspectives. They agreed, however, that they would have been better prepared if they had been given a chance to bond with their counterparts from other courses. They had only met twice as a group to talk about the trip, and only to discuss logistics.

Course Modifications

We will modify the three courses, but keep them separate. All three courses will now meet in the same meeting module on the same days. This will allow us to program a series of guest speakers that can address common meetings in order to expose the students to common experiences, including discussion sessions. The speaker series will particularly focus on environmental issues and controversies in the New Jersey area that mirror conflicts in Yellowstone. The common meetings will also be in a module and venue that fosters greater interaction between Stockton students and members of the community, making it easier to bring specific guest speakers to present various viewpoints of different stakeholders.

Each of the three courses will meet twice a week (evening module) in the lecture hall incorporated in the campus Sustainable Living Learning Community. Stockton College recently incorporated four Living Learning Communities (LLCs) into its residential life. Students in the Sustainability LLC, one of the most popular communities, will have the opportunity to attend some of the guest talks even if they are not enrolled in any of the three courses. These discussions will also be open to both students and non-matriculated members of the South Jersey community.

We anticipate trying this once and then reverting to the winter field experience in one year. We will evaluate the two different schedules (winter and summer field experiences) and then proceed with the option that works better for all parties involved in the future.

Implementation of an Active Learning Model Online: "Politics in Action" in the Greater Yellowstone Ecosystem

Soleiman Kiasatpour

Abstract—This study provides an overview of some of the issues at stake in the national parks debate and the Greater Yellowstone Ecosystem (GYE). After describing the "Politics in Action" model, the paper provides a summary of findings from the implementation of the model in two online introduction to American politics courses conducted at Western Kentucky University. Students looked at how different interest groups in the politics of the GYE framed the debate. They also researched organizational structures and public relations. Samples of online discussion questions and student responses are presented.

Introduction

Political science faculty continuously struggle with how to get their students to actively participate in learning about politics. Interest in active learning, service-learning and other pedagogical approaches in the field demonstrate this concern. What can instructors do to bring diverse learning methods together and accomplish these goals? In a previous article, a framework for how to use three contentious issues concerning the Greater Yellowstone Ecosystem—gray wolf reintroduction and delisting, winter use of the park, and bison and brucellosis management—to enhance student learning was presented (see Kiasatpour and Whitfield, 2008). The "Politics in Action" (PIA) framework is based on the assumption that students learn best when they are exposed to the political process

Missouri Western State University students.

through dynamic case studies of issues that are ongoing arenas of conflict and cooperation. Outlining and describing the political dynamics of interest group activity in an interesting issue area, including those affecting the Greater Yellowstone Ecosystem, and then requiring students to advocate on behalf of these interests in various in-class and outside-of-class exercises, help to accomplish active learning, which may lead to greater civic engagement. To assess the validity of this proposition, the PIA learning model was implemented in two online introductory American government classes at Western Kentucky University. This study first addresses some assumptions associated with civic engagement and civic education overall. Then it outlines some of the issues at stake in the national parks debate, in general, and the GYE, in particular. The study concludes with an assessment of the PIA model in the context of online instruction.

Case Studies and PIA

In order to increase students' civic engagement and interest in politics, case studies and class activities relevant to their lives are important. One particular context that is broad enough to bring in multiple disciplines, yet narrow enough to stir passions across different populations, is the politics of the Greater Yellowstone Ecosystem. In particular, two contentious political issues—gray wolf reintroduction and possible delisting and winter use of the park—were used in the PIA class project. A third and equally important topic, bison and brucellosis management, provides another valuable case study. These three issues vividly demonstrate how myriad interest groups, government agencies and individuals frame the discourse and compete and compromise in the policy-making arena. These conflicts may seem unique to Yellowstone. However, each can be used as a model of a political interaction involving similar issues. Kiasatpour and Whitfield (2008) provide an extensive list of potential topics that can be the focus of similar "Politics in Action" models. There are hundreds of endangered species, disputes over land use and other similar issues in every state of the United States to provide ample subject matter for a PIA approach to teaching and learning.

Interactive Learning

Many have highlighted the usefulness of active learning teaching methods in a number of courses in the field of political science. Shellman (2001) implements an active learning simulation of German elections in a comparative politics course; Cutler and Hay (2000) use an issue-based role-play to teach the political economy of environmental politics; and Hensley (1993) utilizes role-play in a constitutional law course in which students "become" attorneys and Supreme Court justices and write advocacy papers. Many of these authors also emphasize the pedagogical goals that such active learning exercises accomplish. Brock and Cameron (1999) and Shellman and Turan (2003) have argued that following the Kolb model of experiential learning in political science courses is not only effective, but also necessary. This model includes the four stages of learning: abstract conceptualization, active experimentation, concrete experience, and reflexive observation. By contextualizing decision-making and applying concepts and theories to real world situations, these approaches encourage more student learning and interaction. The PIA model seeks to achieve these different stages of learning with the intention of promoting civic engagement by exposing students to the politics of the GYE.

The Greater Yellowstone Ecosystem disputes are relevant to all three different "kinds of citizens" that Westheimer and Kahne (2004) delineate—the personally responsible citizen, the participatory citizen and the justice-oriented citizen. These three types of citizens are all civically engaged but at different levels and to various degrees. Active learning models that are geared towards civic engagement promotion should at minimum strive to get students involved and interested enough that they would contemplate pursuing some aspect of participation in the political process. The GYE issues are relevant and interesting enough that students will be more likely to get involved in the proposed exercises than topics that seem more removed from their actual lives. As a result they will, hopefully, become more politically engaged in the real world.

Through the assigned exercises students first see how actual groups and individuals frame the debate and what language, symbols and rhetorical devices they employ in support of their causes. Thus, they analyze the environmental discourses at play. Then they are introduced to the

institutional context; the agents and motivations of the actors; and the legal and juridical constraints. Finally, they identify the outcomes, which are typically transitory and up for renegotiation. The basic framework is broad enough to be implemented in ecology, political science, introductory public policy, environmental politics, and political behavior courses. The information can be delivered in many ways—simulations, structured debates and role-play scenarios, depending upon the course, class size and level. As will be shown below, the PIA model has online applications as well.

Yellowstone National Park and the National Parks Debate

The national parks, and Yellowstone National Park (YNP), in particular, provide a historically rich backdrop for the study of political action. Passions are high as advocates consider wolves and bison "charismatic mega fauna," and the snowmobile represents the snowmobiler's escape and, more broadly, liberties of being an American. The battle over ideas and the debate over the effects and the outcomes continue to this day. How this battle plays out and unfolds is what politics is all about. While Harold Laswell's "who gets, what, when and how" approach to politics is a good description of the Politics in Action of the Greater Yellowstone Ecosystem, E. E. Schattschneider's approach seems more fitting: Politics is never "merely a question of getting something," nor is it a matter of power and awe, but more a matter of persuasion (Schattschneider, 1969). According to this definition, "[Politics] is the search for a common ground on which disputing parties can agree freely to coexist at least temporarily; and as an activity, it is characterized by bargaining, trading, information, influence, judgment and accommodation" (Mileur, 1992).

The PIA model serves multiple pedagogical goals. It can function as a case study of the entire policy cycle or of specific parts of the cycle, such as agenda setting. It can also be used to show interest group activity, issue advocacy and/or conflict resolution. One approach could be to focus on framing the issues by their various proponents. This perspective is conducive to courses that emphasize writing and critical thinking or that have an active learning application component. It is also appropriate for an online course.

Political scientists have often emphasized the importance of metaphors and framing in policymaking. Stone (1997) and Lakoff (1996) have highlighted

the importance of media representation of problems and narratives in the policy-making process. Some of the proposed class exercises are geared towards showing students how critical framing is and why one should pay close attention to the discourse surrounding the issues. Having students identify the symbols and metaphors and frames that each side of an issue uses to pursue their policy objective helps them become better critical thinkers and consumers of political information.

The politics of wolf reintroduction clearly demonstrate the significance of names and labels (Nie, 2003). When Canadian wolves were first brought to Yellowstone, they were called an "experimental" population, which means if they wandered outside the park they could be shot since they were not officially protected by the Endangered Species Act (ESA). According to the state of Wyoming's plan to delist the wolf in accordance with its designation as "predator," the wolf can be shot on sight. As "trophy game," the wolf falls into a different category. When wolves were first reintroduced in Yellowstone, one goal was to create a "viable and recovered wolf population." The definition of a "breeding pair" and or "viable population" is just as influenced by politics as by biology and ecology.

Framing occurs at multiple stages. Initially defining a condition as a problem in need of a public policy solution is the first step. A historical review of the issues at play in the GYE reveals how the extirpation of the wolf led to an increased elk population, which lead to a decline in vegetation, which caused soil erosion. Whether these conditions need a public policy solution is a matter of how they are defined and/or redefined (Lowery & Brasher, 2004).

The politics of the GYE can be used to illustrate the role of issue networks, advocacy coalitions, policy networks and policy communities. Thus, the class can make connections among local, state, national actors and institutions that influence the policy-making process. The debate over the park straddles local, state and national levels, so the importance of cooperative federalism and not-so-cooperative federalism can both be addressed as well. At a broader level the debate pits members of the "New and Old West" against each other. New westerners are mainly urbanite environmentalists who use land generally for recreation, while old westerners live in smaller rural communities and make their living off the land (Stiles, 2005). There is a

clash of cultures between the two "Wests" that extends well beyond the wolf controversy (Quillen, 1999). With the advent of the Internet and local and outside groups' ability to advocate on behalf of their interests, the battle to sway public opinion and influence state and national lawmakers has become open to more and more participants not only from the West (Old and/or New) but from all across America. As such, not only are students introduced to traditional interest groups, but they also are exposed to the role of social movements and advocacy coalitions. Students learn about how "average" citizens get involved in the politics of their communities and see that civic engagement is not necessarily complicated nor reserved for lobbyists and/or politicians.

Public land use has been a key issue in the GYE. To personalize this issue to all students, the question of how government policy may affect their ability to use the national parks and forests and public lands, in general, can be the subject of course assignments. The snowmobile case or the winter use of the park issue focuses on this concern. This debate pits snowmobilers and some businesses against environmentalists and outdoor enthusiasts, such as skiers and advocates of snow coaches. It also is an issue for those trying to protect bison from leaving the park by using the packed trails created by snowmobiles. In general, there is a difference of opinion between what can be called "motorized" and "non-motorized" groups over wilderness and public land use and other social values. The contested values are numerous enough that many PIA topics can be envisioned. In the context of the GYE, the snowmobilers insist that they are "paying their way" through user fees that help with maintenance and up-keep of trails. They also contend that they work closely with the park's management in following all laws and regulations. Further, they believe that as the motto inscribed on Roosevelt Arch at the north entrance of Yellowstone National Park says, "For the Benefit and Enjoyment of the People," their activity is permissible. They advocate for continued access to the park and other national forests. Specifically when it comes to YNP, they have suggested that in addition to commercially guided snowmobiles, a portion of snowmobiles should be "non-commercially guided" and "unguided." The former—someone who has passed a certification process—could lead a small group of snowmobiles, and the latter—those who have viewed a short video on park use—could go into the park unguided. Furthermore, some advocate the reentry of non-

BAT (best available technology), or, in general, two-stroke engine machines, because they do not get stuck in snowdrifts and are thus "safer" for the riders. The controversy is replete with groups and individuals who have strong arguments for their position. Thus, it too can serve as a dynamic model of group interaction conducive to student discussion and a variety of approaches in the classroom. The bison and brucellosis management issue is similar to the wolf and winter use of the park issues but was not assigned in the classes described here due to small enrollments. However, it is easily adaptable to this approach.

Implementing PIA in an Online American Politics Course

The Politics in Action model of interest group interaction in the Greater Yellowstone Ecosystem was implemented in two online introductory American politics courses in spring and summer of 2008 at Western Kentucky University. The assignment replaced lecture and discussion of the chapter on interest groups, and an analytical written assignment followed an introduction to the wolf and snowmobile controversy. In the following section, the class and written assignments are outlined. Sample student responses and summaries of debates are presented in the Appendix. An evaluation of the reactions concludes the study.

Class and Written Assignments

The online American National Government class uses Blackboard© as the main platform for delivering the course online. This program allows universities and other educational institutions to provide Web-based education. The main functions that I employ in Blackboard© include the Documents, Discussion Board, Assignment, External Links and Assessment pages. These allow me to provide the students with the background readings; a platform for discussing their views with their peers; a way to submit completed work; a link to outside sources that can help them start the research needed to fulfill the tasks of the assignment; and an assessment component.

As noted earlier, the PIA assignment was used for the section on interest groups in two online introductory American politics courses (a spring semester and a three-week summer session course; with 18 and eight students, respectively). In the semester-long course, the assignment lasted a week and a half, including implementation and assessment; while in the summer class, it took three days. The assignment involves two main components: a structured debate and an analytical persuasive writing piece.

Initially, students were divided into two groups and asked to focus on either the wolf reintroduction or winter use issue in the GYE. The "wolf backgrounder" and "winter use backgrounder" readings are brief overviews of the historical development of the issues, actors, legislation, and questions of the law that are involved, and the current state of affairs. These readings were posted on the discussion board as attachments.

After reading one backgrounder, students were given a list of seven questions. Each student was required to be the primary responder to one of the questions and to respond to any student that reacted to the entry on the discussion board. The goal was to encourage lively debate. Subsequently, students had the option to expand upon their work in the first component by doing an analytical thought paper instead of the course paper.

Analysis of the debate that ensued on the discussion board during both courses demonstrated active student engagement in the learning process. The questions posed on the discussion board challenged students to develop thoughtful and well-substantiated solutions to the problems at hand. Furthermore, the discussion board medium afforded students the time to prepare and present well constructed arguments. This is noteworthy given that many students in a traditional classroom setting neglect to participate in classroom discussions due to lack of preparation or domination of the discussion by a few individuals. Students in both pilot classes demonstrated an interest and engagement in solutions for this topic that is difficult to replicate in a large traditional classroom setting. Sample questions and student reactions demonstrating active engagement in the learning process are found in the Appendix.

Written Expansion Assignment

For the written assignment, students were to write an essay in which they would formalize their contributions in the structured debate; provide evidence for both sides of the debate; state the respective policy prescriptions; and then provide a conclusion that outlined their preferred solution and why. Two conditions were that their solutions should be inexpensive and acceptable to both parties.

Evaluation

Based on preliminary evaluation of the responses to both the structured debates and the written expansion essay, there is evidence in support of the view that such active learning exercises are more personalized and interesting for the students involved. I received several excited emails requesting permission to do the "Yellowstone" essay instead of the traditional paper, even though the requirements were greater for the "Yellowstone" piece. On average, the responses to the discussion questions for the structured debate were longer and more thorough than for the typical discussion questions assigned to interest group topics. While the number of entries required for both were the same, students contributed more lengthy and nuanced responses for the PIA assignment than previous semester classes who did not do the PIA assignment. Students engaged in more rigorous research and attempted to find alternative theories and views in order to adequately represent both sides of the debate. For example, in one paper on Canis lupus, a student raised an alternative theory that is often overlooked in most debates on this issue. Instead of focusing on the pro- and con-type arguments, she raised the point that the wolf debate is misplaced since the ranchers sustain monetary losses from a host of causes other than wolf predation. These include coyotes, dogs, vultures, weather-related deaths, disease and, more importantly, changing local markets and globalization. While some of these factors could be alleviated, since they seem to be more within the control of the ranchers and their industry, others cause greater loss of livelihood than wolves. The ability of students to move beyond the conventional arguments in any given issue analysis-type paper is a goal of all instructors.

The Politics in Action approach appears to help promote more active learning and preliminary reactions from students in two online courses. This seems to suggest that the assignments encouraged students to think

about how they could be more involved in civic engagement as well. Further evaluation of this approach in larger classes and more traditional settings is warranted.

References

Brock, K.L., & Cameron, B.J. (1999). Enlivening political science courses with Kolb's learning preference model. *PS: Political Science and Politics,* 32, 251-256.

Clemons, R., & McBeth, M.K. (2001). *Public policy praxis.* Upper Saddle River, NJ: Prentice-Hall.

Cutler, C., & Hay, I. (2000). 'Club dread': Applying and refining an issues-based role play on environment, economy, and culture. *Journal of Geography in Higher Education,* 24, 179-197.

Hensley, T.R. (1993). Come to the edge: Role playing activities in a constitutional law class. *PS: Political Science and Politics,* 26, 64-8.

Kiasatpour, S., & Whitfield, C. (2008). Politics in action: Wolves, snowmobiles and bison and the Greater Yellowstone Ecosystem. *PS: Political Science and Politics,* 41, 193-206.

Lakoff, G. (1996). *Moral politics: What conservatives know that liberals don't.* Chicago, IL: The University of Chicago Press.

Lowery, D., & Brasher, H. (2004). *Organized interests and American government.* New York, NY: McGraw-Hill.

Mileur, J.M. (1992). The politics of E. E. Schattschneider. *PS Political Science and Politics,* 25, 176-180.

United States Department of Housing and Urban Development. *Indiana income limits* [Data file]. Retrieved from huduser.org/Datasets/IL/IL08/in_fy2008.pdf

National Park Service. *Statistical abstract.* Retrieved from 2.nature.nps.gov/stats/abst2005.pdf.

Nie, M.A. (2003). *Beyond wolves: The politics of wolf recovery and management.* Minneapolis, MN: The University of Minnesota Press.

Quillen, E. (1999, September 13). Isn't it about time for a New West celebration? *High Country News.* Retrieved from hcn.org/servlets/hcn.Article?article_id=5264

Schattschneider, E.E. (1969). *Two hundred million Americans in search of a government.* New York, NY: Holt, Reinhart and Winston, Inc.

Shellman, S.M. (2001). Active learning in comparative politics: A mock German election and coalition-formation simulation. *PS: Political Science and Politics,* 34, 827-834.

Shellman, S.M. and Turan, K. (2003). The Cyprus Crisis: A Multilateral Bargaining Simulation. *Simulation and Gaming,* 34(2), 281-91.

Staff writer. (2006, October 1). Nominee endorses snowmobile use. *Billings Gazette.* Retrieved from billingsgazette.net/articles/2006/10/01/news/wyoming/40-nominee.txt

Stiles, J. (2005, April 13). Old West vs. New West. *The Arizona Republic.* Retrieved from azcentral.com/arizonarepublic/opinions/articles/0413stiles13.html

Stone, D. (2001). *Policy paradox: The art of political decision making.* New York, NY: W.W. Norton.

Westheimer, J., & Kahne, J. (2004). Educating the 'good' citizen: Political choices and pedagogical goals. *PS: Political Science & Politics,* (April), 241-4.

Appendix

Sample Discussion Board Questions and Reactions
(as provided by students)

Select Wolf Questions and Answers

1. **Should *Canis Lupus* be taken off of the endangered species list? Why or why not? Use the reasoning one or more of the "real" advocates would argue and cite your sources and provide the URLs.**

Response 1

Canis Lupus should not be taken off the endangered species list. *Canis Lupus* has shown that it is declining. If it is taken off the endangered species list, it will only continue to decline and perhaps more rapidly. According to Environment News Service, the wolves are on their way to regaining their prominence in the states but are not quite there yet. Fish and Wildlife Services Director Steve Williams states that the department is progressing towards the recovery of gray wolves across their range. They are working on rebuilding the population of the wolves. Once the wolves have become more abundant, they can be downlisted to maybe just "threatened," like the gray wolves are in Minnesota.

An opinion article in *The New York Times* expresses an advocate's opinions on the gray wolf being delisted. According to the article, the Bush administration has revised the Endangered Species Act. They have revised it in such a way that would allow 900 previously protected wolves to be killed. The article also states that the revised rule is aimed at protecting elk and deer for hunters instead of protecting the cattle and sheep.

nytimes.com/2008/01/28/opinion/28mon2.html?_r=2&ref=opinion&oref=slogin&oref=slogin

ens-newswire.com/ens/mar2003/2003-03-21-10.asp

Response 2

Wolves should be taken off the "endangered species list." Ranchers should have the right to protect their livestock and profits. However, if there were

no wolves, ranchers would still lose livestock. The wolves are not entirely to blame for losses. I live on a cattle farm. Every year we expect to lose 10 percent of our calves. And we usually lose a few cows due to "old age" and sickness. This is the "nature of the business."

Response 3

I can understand your point of view that ranchers should be allowed to shoot a certain number of wolves. However, I don't believe that a limit on the number of wolves that can be killed is a valid solution because I believe that if a farmer or rancher is allowed to shoot one wolf that threatens his/her herd, they will not hesitate to shoot other wolves that threaten their herd even if they have already killed their limit. I think it would be a logistical nightmare to try and enforce a law restricting the number that can be killed, and it would be easier to enforce a law that outlaws killing wolves all together.

While there are laws that limit the killing of other hunted species (e.g., deer and other game animals), I don't believe that this type of law would be easily enforced when concerning wolves. The reason for this is because wolves are predators, and will usually be killed for "protection" and not for food or sport. I think that hunting of other game animals can be regulated very well because they are killed for different reasons than wolves, and if you cannot enforce the limit on killings then it is pretty much open season on the species.

2. **What are some possible solutions for ranchers to keep wolves off of their property? Which ones will work better, and which ones won't? Why? Think of low-cost solutions. Who should bear the costs? Why? You should first provide the solutions that have been actually offered and or implemented (cite your sources and provide the URLs).**

Response 1

According to the Defenders of Wildlife, they are working closely with ranchers to minimize livestock loss. This organization claims they provide funds to ranchers to install adequate fencing and they also reimbursed ranchers for livestock loss due to wolves. This group is advised by a committee of cattle and sheep growers (Defenders of Wildlife).

However, ranchers in Montana have stated that the growing wolf population is affecting their bottom lines. They believe they are bearing an "unfair portion" of the cost of wolf protection. During an "anti-wolf" radio message, Steve Pilcher, executive vice president of the Montana Stockgrowers Association, said, "If America wants wolves, why are we paying for it" (thepioneer.com).

Many Idaho ranchers are learning to live with the wolves. They are using the more cost effective methods of moving their livestock around and the use of guard dogs. The state of Idaho is supposed to take over the "wolf management" this month. The wolf population is estimated to be around 788. This number has nearly tripled since 2002 (idahostatesman.com).

While ranchers have sustained livestock loss because of wolves, they have most likely lost more livestock due to "natural causes." My husband and I live on a farm. We have 75 head of cattle. We have lost a few calves because of the coyote population in the area. But we have lost many more due to other causes. Livestock loss is inevitable.

Fencing to keep wolves away from livestock is the best option. However, this solution is very expensive. Because the government is responsible for the wolves being in these areas, they should be responsible for at least half the cost.

The use of guard dogs and moving cattle to different pastures are more cost friendly options, but would be less effective than fencing. The Idaho ranchers have the right idea. They have learned to live with the wolves.

defenders.org/wolfrecovery
thepioneer.com/agriculture/dec7wolves.html
idahostatesman.com/localnews/story/21460.html

A variety of solutions that emerged from the discussion and research demonstrated that the wolf controversy was "hot" enough to generate interesting debate. These "solutions" included:

- Guard dogs—Akbash guard dogs (Turkish breed used by sheepherders). Great Pyrenees are the most popular breeds, although the Anatolian Shepherd, Komondor, Maremma and Shar Planinetz are also used in Colorado.
- Using llama and donkeys, which are kept with the herd and are aggressive towards predators. They also sound alarm.
- Compensate ranchers.
- Shoot wolves with rubber bullets—buckshot to scare them away.
- Use fladry (flags that startle the wolves).
- Use noise makers.
- Shock collars on wolves and "wired" perimeters around livestock areas.
- Fencing (government subsidized).
- Limited hunting.

Facing Wolves and Redefining Ourselves

Elizabeth Latosi-Sawin

Abstract—This chapter is a personal essay that recounts the author's first wolf sighting and meeting with ranger-scientists and cattle ranchers to learn about the impact of wolves on the Greater Yellowstone Ecosystem (GYE). The author explores the competing interests of stakeholders, as well as the threat to the environment of development in Paradise Valley. Suggestions are made to ameliorate current conflict and to preserve wilderness for future generations. The author describes an environmental literature course and a multi-disciplinary program inspired by her Yellowstone experience. Outdoor Semester students will travel through the Great Plains, Rocky Mountains and Yellowstone studying the inextricable connection between energy and life, while students in Missouri will explore features of their bioregion and local conflicts. Efforts to engage students in active citizenship are described.

Introduction

"Elusive." That's how wildlife biologist Dan Stahler described wolves for the American Democracy Project's Yellowstone seminar, "Civic Engagement in Action: The Stewardship of Public Lands." *Elusive* would also be any easy solution to the competing interests of engaged citizens, dispassionate scientists, frustrated rangers and struggling ranchers when it comes to the wolves in Yellowstone.

Montana Rancher, Martin Davis, discusses the effect of wolves on his operation in Paradise Valley to members of the ADP Stewardship Group.

In the late afternoon of July 30, 2008, we were seated comfortably in a conference room at the Mammoth Hotel in Gardiner, far warmer than we had been 10 hours earlier during our wolf- and bear-watching tour. As Dan told us about the size of wolf packs, their behavior, diets and deaths,

my thoughts wandered back to my own bumbling attempt to see something wild through powerful telescopes that sprouted at the sides of roads and rock outcroppings on that cold morning.

Having made other stops with little luck, Mike Yochim, our ranger guide, drove the van down a steep shoulder in Lamar Valley where others hunched over telescopes. Soon our group settled knee-deep in sage and shared our own directions for spotting whatever wildlife had stopped traffic:

"Focus a couple of hundred yards beneath the tree line."
"There he is in the grass. He raises his head and then lies down again."
"The grass is too tall to see him now."
"Wait. He'll raise his head again."

In my eagerness to join them, I knocked my head against the van's rearview mirror. Grabbing my glasses with fingers that had residual sunblock lotion on them, I was suddenly more worried about being able to see at all than of getting to see the wolf. As I washed my hands and glasses, I continued to hear the hushed and respectful excitement of people seeing a wolf in the wild. When I finally earned a turn at one of the scopes, it was either out of focus, or the wolf was out of view. A pair of binoculars brought the other side of the valley, some two miles distant, clearly into view, but not precisely enough. I drifted from scope to scope until I gave up, and just started to take pictures of seminar participants viewing the wolf. In some imaginative triangulation through them, I would have my encounter in the wilderness.

Then just as Mike said it was time to go, someone said calmly, "I have him clearly in view." It was my last chance. I put my eye to the telescope and was startled to see the head of a black wolf in three-quarter profile with ears pointed.

A striking black silhouette in the wilderness.
A black wolf sitting in a field of tall grass and sage.
A wild wolf.
The first wolf I had ever seen.

❧ ❧ ❧ ❧

That image, still fresh in my memory, made me sympathetic to the wolf during Dan's afternoon lecture.

"The ability to see a wolf in Yellowstone is unique."

And I had had such a trophy experience. One to tell others about.

"When the elk migrate to the northern range, the wolves in Yellowstone follow."

Where was that black wolf now, at 3:30 in the afternoon?

"Wolves are selective hunters but are successful in their hunts only 20 percent of the time."

So they aren't killing machines. What do they kill and when?

"A wolf pack has an alpha male, an alpha female, other adults, yearlings and pups."

Then they are social animals who also have to feed their young.

"Grizzly bears frequently take over their kills, with male bears benefiting the most."

Predators and prey. The strongest feast, the weak die.

"We have pathological fears about wolves, fed by selective journalism. A wolf kills a sheep and it's reported. Lightning kills 20 and it's not worthy of report."

Are deaths by wolves more personal? More dramatic? Steeped in mythology?

Little Red Riding Hood and the Big Bad Wolf.

My own fear of large dogs.

"Of 412,000 head of livestock in the Yellowstone area (cattle and sheep), 22 cattle and 52 sheep are lost to wolves. That's only 0.1 percent."

Can't ranchers let wolves have one or two of their calves?

"New subdivisions in Paradise Valley now pose other problems for migrating wolves."

Can't human beings limit where they choose to live?

❧ ❧ ❧ ❧

The following morning I joined the study team for field research in Paradise Valley, wanting to hear what a rancher would say about the reintroduction of wolves into Yellowstone. We took Highway 89 north toward Livingston, made a right on Pine Creek Road, crossed the river, took a right onto East River Road, went past a church, and then drove a mile to the left on Luccock Park Road, where we found the Flying Diamond sign leading us to our rancher.

Martin Davis was a tall, slim man who wore jeans, a western buckle, a long-sleeved shirt and a light straw cowboy hat. A quiet and self-effacing man, he stood with his hands in his pockets, speaking slowly and thoughtfully. There was a shyness in him that I hadn't expected. This was no phenomenally rich television rancher, no J.R. Ewing of television's "Dallas." We sat on tree stumps that we had arranged to have a view of his ranch in Paradise Valley. How extraordinarily beautiful this place was! I couldn't stop looking out over the enormous, wide-open valley, even as I listened to Martin's words.

His parents had migrated to this part of Montana some 44 years earlier, and now he owned one-third of the original ranch. His widowed mother and brother owned the other two sections. It was no longer easy to make a living by cattle ranching. The people who wanted vacation homes in Paradise Valley had driven up land prices so that buying additional land was prohibitively expensive. Although they would have liked to ranch with their dad, Martin's sons had to seek employment in Colorado. The pressure from suburbanites with their "ranchettes" was not the only problem Martin faced. "Yellowstone is pumping out wolves," he said, "and there isn't room out here."

Martin explained his ranching operation on the northern boundary of Yellowstone. Calves born in early spring achieve a weight of 600 pounds by the middle of October, when they are then sent to the Midwest Corn Belt for finishing. In mid-June when they graze on his mountain pasture, close to Emigrant Peak, wolves stalk them. The first came in 1999. His nephew saw "a little black thing" that turned out to be a pack of seven adult wolves and six pups using the brush in a 10- to 15-acre basin as a rendezvous spot. When wolves came over the ridge from Yellowstone, his cattle ran to the basin floor and stood in a tight group. He witnessed this defensive move against a pack led by "a big black wolf." The calves couldn't feed in the

pasture. When he took them to market, they weighed closer to 500 pounds a piece, a loss of 100 pounds per animal. The compensation program for ranchers didn't take this kind of loss into account, or reimburse ranchers for the fact that the presence of wolves also stressed cows who then did not come into estrus. His income decreased with the decreasing number of calves.

Martin's affection for the "old mama cows" was apparent. "They mean a lot to us," he said. "We know which ones make us our living." The threat of wolf packs holding his cattle at bay sometimes wakes him up in the middle of the night. "Something tells me I've got to go" and then he drives 25 miles across the valley to his summer range to check on his herd. "If you owned a hardware store," Martin asked, "would you leave the back door open and hope they won't take much?"

The black wolf that I had seen the previous morning was no longer just a romantic icon of wilderness and freedom, but also a threatening presence. In Martin's summer range basin, wolf and cattle, hungry pups and defenseless calves, struggled for life.

Problems

Although wolves are smart and aggressive, current Fish and Wildlife regulations allow ranchers only to chase and harass them. "Rubber bullets and bean bag guns don't work," Martin noted. "They work only to 50 yards, and that's all the closer you can get to the wolves. You whack the dog when it steals your steak and not a few days later. Why can't we shoot one or two wolves who are chasing our cows?"

Wolves do more than harass his cattle. His nephew once came upon a calf chewed from head to tail. He "stayed on the calf" while Martin had to call Fish and Wildlife to confirm that it was a wolf kill, even though a wolf's prints are large and distinctive. Martin played by the rules, unlike those who believe that ranchers should just "shoot, shovel and shut up." Even Fish and Wildlife would concede that ranchers are being compensated for only one out of two or three calves that they lose, while Martin believes the number is more like "one out of seven or eight." Calves sometimes "disappear."

I began to see the wolf more clearly as a natural predator that had made this man's livelihood more difficult. It's one thing for me to believe that wolves, bison, grizzlies and elk have the right to exist and to migrate while I live comfortably in Missouri 1,000 miles away, but what would my frame of mind be if wolves threatened my family's livelihood? "The wolf is doing what a wolf does to survive," Martin conceded, "but when it is on private property, why can't we shoot one or two? We are trying to feed this nation."

Here, then, are competing interests. If wolves have been so successfully re-introduced into Yellowstone that they are spilling out of park boundaries, why shouldn't some defensive measures be permitted for ranchers along the boundaries of Yellowstone? Do we expect ranchers to pay alone for our collective desire to save some small part of America's wilderness? On the other hand, is Paradise Valley the only place where calves can be bred for beef production to feed our nation?

Who will inhabit this valley if the ranchers are pushed out? People with summer homes for recreation? Once-productive farmland in Silicon Valley is now paved over with corporate parks. Thousands of acres of orchards in Florida are lost to theme parks, hotels, condominiums and people's desire to live idyllic lives in a subtropical environment. And some of the richest farmland in the American Midwest has been lost to interstate highways that cater to our impatience to move fast. We need to rethink land use.

If Paradise Valley is carved into many small ranchettes, migrating animals from Yellowstone will face an even greater threat as the human population in the area increases. It would be far better to work out acceptable solutions with ranchers who can hold relatively large parcels of land intact and who might be able to preserve for future generations the glorious and uninterrupted sweep of this valley.

Suggestions for Land Use

Although additional research into the feasibility of the following suggestions is needed, these are some compromises that could be helpful in the short run:

1. Relocate the grazing animals that are just one ridge away from the northern boundary of Yellowstone National Park.
2. Compensate ranchers at full market value for the weight of the calves eaten by wolves.
3. Allow ranchers to document with digital photos the losses they sustain from wolves.
4. Establish an environmental property tax for summer-only residences in Paradise Valley to compensate ranchers and to discourage increased parceling out of acreage.
5. Establish a recreational tax for people vacationing in Paradise Valley to be paid into a fund for ranchers who gradually decrease the size of their herds and switch to cash crops that increase soil fertility.

In the long run, however, the federal government should extend the northern boundary of Yellowstone National Park into Paradise Valley, purchasing acreage at fair market value from ranchers as they and their families retire. By doing this, large sweeps of land will remain intact and prevent the development that will transform this valley into yet another playground for the wealthy and, with higher taxes, force all the locals out.

It appears that wolves may not be as great a threat to ranchers as are vacationers who want a piece of "Paradise." Their presence is already driving up land prices so that ranchers cannot afford to expand, move their operations or easily absorb the loss of calves to wolves. If Paradise Valley becomes checkered with summer homes, condos, children, pets and fenced backyards, future conflicts between human beings and migrating wolves will only intensify. Rather than killing wolves that take down an occasional calf, why don't we do what we can to hold this land in common for future generations and educate people about the value of wilderness, an area where man—according to the Wilderness Act of 1964—is himself "a visitor who does not remain."

Environmental Literature

I returned from the Stewardship of the Public Lands seminar determined to bring Missouri Western State University (MWSU) students back to Yellowstone as part of our Outdoor Semester program, a multi-disciplinary, faculty-student learning community. I recruited faculty to the cause; secured permission from administrators; wrote a grant; and made 32 campus presentations introducing the theme for Outdoor Semester 2009: Energy and Life. This theme emphasizes one of the four national initiatives set by President Barack Obama (energy, health, education and defense), and immediately seeks solutions to skyrocketing costs for fuel—without which there is no life. I remembered Aldo Leopold's words in *A Sand County Almanac:* "Land...is not merely soil; it is a fountain of energy flowing through a circuit of soils, plants and animals. Food chains are the living channels which conduct energy upward; death and decay return it to the soil" (Leopold, 1949, p. 216).

The food chain from ranchers in Montana to my students in Missouri is short. Calves fattened in mountain pastures are transported to the Midwest where they are fed corn until they reach full market weight. Ranch land in the Greater Yellowstone Ecosystem is thus connected with land use in the Midwest and with the environmentally costly consumption of beef in the United States. From an assortment of required readings of environmental literature, students will be given an opportunity to read *Fast Food Nation* to learn what impact the production of beef has had on the land, on animals in industrialized settings, and on people who work in meatpacking plants and fast food outlets.

But before my environmental literature class considers the controversial issues of land use and animal rights, they will first explore—through a series of short stories, poetry and essays—human nature and their own place in the natural world. Are human beings animals with instinctual needs? What do our encounters with other creatures reveal about us? What do we know about the place we call "home" and what are our responsibilities toward it? Does the use of human reason give us "dominion" over nature, or did Genesis in the Judeo-Christian tradition make human beings "stewards" over the natural

world? These are among the questions raised by the central text in my course, *Literature and the Environment: A Reader on Nature and Culture* (Anderson, Slovic, & O'Grady, 1999).

The study of literature is a compelling way of expanding a person's thoughts and experiences. Scott Slovic points out in *A Companion to Environmental Philosophy* that literary representations of nature are powerful because "images are more impressive than statistics" (Jamieson, 2003, p. 260), and, we might add, that stories can be more convincing than arguments. Stories permit a reader to enter into an imaginative construction of a world where one's own views can be temporarily suspended without loss of face or faith. Stories and poetry can move people to care about animals, forests, rivers and mountains, and to see themselves with a rare clarity. The deep and varied range of past human experience captured in creative literature permits a reader to recognize, accept or reject some part of herself. Will students identify with Henry David Thoreau, who declared in "Solitude" that he "never felt lonesome" in the presence of nature (Anderson, Slovic, & O'Grady, 1999, p. 49)? Or will they sympathize with Lester Rowntree's own experiences on solitary mountain excursions, which left her believing that "a certain amount of loneliness is necessary to us all" (Anderson, Slovic, & O'Grady 1999, p. 25). This literature course will lead students gently from the inside out, in order to close a potential gap between human culture and the natural world. I want to leave students feeling hopeful and engaged.

I will have a split section of students in environmental literature in the fall of 2009. Twenty-five students will be taking the course but staying on campus, while eight additional students will participate in the field trek of Outdoor Semester. The difference in experience between the two groups will set up an interesting classroom dynamic. Apart from the literary selections that everyone will read, the students who stay on campus will spend two weeks reading a book of their own choosing (from a list provided), exploring local landscapes in the area and journaling about their experiences. The eight Outdoor Semester students will be taking a 12-day field trek with faculty on the Great Plains, visiting solar, wind, geothermal, nuclear and fossil fuel energy sites. They will visit the sustainable Land Institute in Kansas, the National Renewable Energy Lab in Colorado, Rocky Mountain National

Park, Yellowstone National Park and the Black Hills of South Dakota. Shared lodging, extensive conversations during travel, and physical activities in the outdoors will affect their relationship to each other and the natural world.

The Outdoor Semester students will be taking four other courses: a geography course in sustainable energy; a composition and research course that will allow them to incorporate field research; a psychology course that will address the stress-relieving features of contact with nature; and a course in fitness and wellness. Both groups of students will present their experiences and findings to each other (and perhaps to the campus at large), but students and faculty in Outdoor Semester are already committed to doing a campus panel presentation that will review the book, *Energy in America,* (Kelley, 2008) and share their experiences on the field trek and in Yellowstone.

A Place Called Home

Students who stay on campus will research their own place on the planet using the parameters of a bioregional quiz developed by Leonard Charles et al. (Anderson, 1999, p. 239). They will (1) identify native edible plants, native grasses, special soil types and major plant associations in our area; (2) research the primary ecological/geological processes that influenced land forms in northwest Missouri; (3) describe the subsistence techniques of the indigenous cultures that lived in Missouri before Lewis and Clark camped in Saint Joseph on their historic journey west; (4) identify migratory birds that stop at the Squaw Creek National Wildlife Refuge just north of Saint Joseph; (5) determine when deer rut in Missouri and identify what species have become extinct in our state; (6) and trace drinking water's journey from precipitation to tap while uncovering controversies surrounding the use of the Missouri River. Outdoor students will report on alternative energy sources and the issues surrounding the Yellowstone Ecosystem. In this way, students will take responsibility for educating themselves and each other about regional and national environmental issues.

Applications of Stewardship

Stewardship of the land must begin with our own patterns of consumption and waste. Leading by example, the university honors program undertook the recycling of aluminum cans and glass bottles for one residence hall during the 2008-09 academic year. I hope to guide my students in a campus-wide recycling effort. We will promote the 5 R's of good citizenship (reduce, reuse, recycle, renew, respect), and draft a proposal to our foundation for funds to purchase or build attractive recycling containers.

Before the semester's end, students will have also learned about many efforts they can take to become engaged citizens. Over 100 actions are recommended in Richard Louv's *Last Child in the Woods,* my second required text. Among these ideas are to "help green your city by lobbying for affordable public transportation;" "recruit families to volunteer on the annual National Public Lands Day to build trails and bridges, plant trees and shrubs, and remove trash and invasive plants;" and "work for legislation at the national, state and local levels to enact bills supporting environmental education in the classroom and outdoor experiential learning" (Louv, 2008, pp. 374-75, 381).

Conclusion

I still remember looking across the 1,280 acres of alfalfa, oats, hay, barley and peas on the Flying Diamond Ranch with the mountains of Yellowstone and Emigrant Peak visible in the distance beneath a deep blue sky. Martin Davis told us that he didn't want to "leave the beauty," and I could feel that beauty, too. There is no one solution to the controversies surrounding the use of our national parks and wilderness areas, but a change in attitude and philosophy would help if only we could do what Barry Lopez suggests in *Of Wolves and Men.* Like the Indians who admired the wolf, and like the wolf himself, we need to learn not only how to "be strong as an individual" but also how to "submerge [our] personal feelings for the good of the tribe" (Lopez, 1978, p. 104). That's what Americans have lacked in recent years: a shared sense of sacrifice and of a mission for a greater whole in which each of us plays only a

part. None of us really has a private backyard. Storms, floods and sometimes even wolves cross these figments of our imagination. What affects the world ultimately comes to affect us, and there is no place to hide from wolves, from men or from ourselves.

References

Anderson, L., Slovic, S., & O'Grady, J.P. (1999). *Literature and the environment: A reader on nature and culture.* New York, NY: Longman.

Jamieson, D. (Ed.). (2003). *A companion to environmental philosophy.* Malden, MA: Blackwell Publishing.

Kelley, I. (2008). *Energy in America: A tour of our fossil fuel culture and beyond.* Lebanon, NH: University of Vermont Press.

Leopold, A. (1949). *A Sand County almanac.* Oxford, UK: Oxford University Press.

Lopez, B.H. (1978). *Of wolves and men.* New York, NY: Charles Scribner's Sons.

Louv, R. (2008). *Last child in the woods: Saving our children from nature-deficit disorder.* Chapel Hill, NC: Algonquin Books.

Schlosser, E. (2005). *Fast Food Nation.* New York, NY: Harper Perennial.

On Wolves, Wildlife and Weather: A Conversation with Douglas W. Smith

Sam Zeveloff, Breanna Bartosz and Kristen Gurr Ellis

Abstract—While at the American Democracy Project's "Politics and the Yellowstone Ecosystem" seminar in the summer of 2006, Dr. Sam Zeveloff attended a lecture by Dr. Douglas Smith on Yellowstone's wolves. He subsequently invited Dr. Smith to give a presentation at Weber State University titled, "Ecology and Ecosystem Effects of Wolves in Yellowstone National Park," in the fall of 2007. At that time, Zeveloff was teaching a senior-level course, Mammalogy, for which he required a civic engagement project. It seemed that a possible way of fulfilling this requirement would be to have students interview Smith. Indeed, the editor of the university's literary journal expressed interest in publishing such an interview. Breanna Bartosz and Kristen Gurr Ellis were selected for this project. This chapter focuses on their conversation with Smith.

Dr. Douglas W. Smith is currently the project leader for the Yellowstone Gray Wolf Restoration Project in Yellowstone National Park. He has co-authored two books: The Wolves of Yellowstone *(1996), a chronology of the first two years of the wolf recovery effort, and* Decade of the Wolf *(2005), which summarizes the first 10 years of wolf restoration in Yellowstone National Park.*

Conversation

What do you think it is about the wolf that has captured the public's admiration, and what is it about the wolf that has resulted in it having an iconic image?

> Well, I think one thing is that the wolf has been a scapegoat for so long, hated for so long. I mean, wolves were literally hated and persecuted for centuries, and I think once the public became aware of that, a lot of people felt bad about it. They're kind of the underdog story where people want them to win now. The

Seminar participants gather for lunch on the beach of Yellowstone Lake.

other thing that is important is that wolves were eliminated from most of the places they lived, and they're only left in the wildest parts of the earth now. I think people feel that that's cool, that they're a symbol of wildness, and that they have an uncompromising nature; they would rather die than compromise. I realize that that's an anthropomorphic way of putting it, but a wolf is going to be a wolf and is not going to adapt to civilization just to get along with people. So people kind of have this wild, pure, idealistic image of wolves, and they really have become the poster child of a lot of environmental issues.

What prompted your passion for wildlife, and wolves in particular?

I was raised in a rural setting, outdoors. My dad had a camp and so I always liked nature. My father encouraged being an outdoorsman and somehow when I was young, I think I saw a magazine article on wolves. I was born in 1960 and at that time, in the late '60s and early '70s, when I was getting interested in nature, wolves were at their lowest population level in North America. There were not very many of them. There were many bounty programs still in place and so the only places they lived were in the North. People didn't really live much in the North, so they couldn't get there to kill the wolves. That kind of twin passion—that North and the wolf that lived there—really were mysterious to me, and romantic. I was very much interested in it, and every time my father saw something on wolves, which wasn't very much back then, he would give it to me. And then my brother bought me a book on wolves that is still printed today, which was written by David Mech in 1970. He gave it to me for Christmas a couple years after 1970, and here I was with this wonderful book. And then it was just all over from there.

An interesting sideline to the story is that I still love the North, too, and since a young age, I've canoed. I've done 18 canoe trips in northern Canada or Alaska. So those kind of twin passions that I got when I was young, the North and wolves, are still very much with me today.

I understand that you did your doctoral work on beavers and then later switched over to wolves. What made you choose working with wolves, or did the wolves kind of choose you?

The wolf work started before the beaver work. So, following up on the previous question, I was obsessed with wolves and got a job working with

them in high school. And then right out of high school, I got a job as a technician in the Isle Royale Wolf Research Program and worked there as a technician during my summers as an undergraduate. I very much wanted to do a graduate project with wolves in my master's program, but I couldn't. There was no funding; there was no opportunity. So the opportunity that I had was with beavers, and I did both my master's and my Ph.D. on beavers because that was the opportunity I could get. I simultaneously continued to work as a technician for Rolf Peterson and Dave Mech as a paying job, often during my summers, because my field season for beavers was during fall and winter, and so I'd go back to working with wolves in the summer and beavers in the winter. I did that for about four or five years, and then I went completely with beavers for my Ph.D., thinking I would never again work with wolves. I couldn't have my dream, but I had to be able to move forward and get an education. So I did that and then the Yellowstone wolf job came open, and I applied as any other candidate would. I think the combination that I was almost done with my Ph.D. and had a lot of wolf experience was a fine one. In other words, it's a good thing that I jumped to beavers because I probably wouldn't have been able to get a graduate degree in time. I might have had to wait too long, and things change.

Are there more opportunities for people to study wolves now compared to when you were in graduate school?

I think so. There are a lot of wolf studies going on now. Back in the '80s there were a handful of studies at the most. Funding was tight; funding is always tight. Maybe it's because I'm aware of it, but I can think of probably eight to 10 wolf research projects going on right now.

However, I found myself in the position that I was in my teenage years when I was writing to wolf biologists. I wrote to Dave Mech when I was 15, and I wrote to him again when I was 18 and he gave me more addresses to write to, and I wrote to all of them. A lot of them didn't respond. I'm getting people writing me now, and I'm trying to respond, mostly by e-mail. I don't get to all of them just because I get too busy, and I feel very badly about that. What I'm getting at is that a lot of people want to volunteer to work on wolves in Yellowstone, but not all of them are qualified. A lot of them come and just want to work on wolves. That's the only thing they're interested in and want to do. I was like that at one point but switched to beavers because it was the opportunity that

was presented to me. I may have a little chip on my shoulder with people who say, "I just want to do wolves," whereas I think you should approach it with, "I'm interested in wolves, and I'll take the opportunity if it comes to me, but I'm also interested in science—learning how to do science properly—and so any project that would be available to me would be good." In response to my volunteers who say, "The only thing I want to do is wolves," I try to say, "Have a broader perspective than that." I had it that way. I didn't have a choice and so I had to do beavers.

Did you originally think that the reintroduction would succeed back in 1995?

I thought it would succeed, but I didn't think it would go as well as it did. The main reason I thought that is because I'm very familiar with the problems of wolves. They move a lot and when they move, they get killed by people. I mean, it's just a fact of life: people kill wolves. You're not going to be able to talk a significant segment of the public out of killing wolves; they just hate them. And so I thought they would move more and get killed more than they actually did. I thought that, eventually, the program would work because wolves are so good at what they do. I mean, they really are generalists and all they need is protection from human killing and adequate food, which is deer, elk, moose or caribou—whatever. There are actually record numbers of deer and elk in the Rocky Mountain West in some areas, and so if they weren't killed, I knew they'd do okay. I thought more would have to die, but that was not true.

Do you have an emotional tie with the wolves, being one of the people that released them?

Unfortunately, I do. I say "unfortunately" because science is supposed to be a dispassionate endeavor. But I don't think this is good. I am personally attached because I've been interested in this animal since I was a boy, literally a boy, and worked my way up through many volunteer jobs, building up my résumé to the point where I got this job. Since I've been there from the beginning and handled all the wolves that came in, and watched their population grow, I cannot help but be very personally involved.

I shouldn't say this because it sounds callous, but when a wolf dies I don't get bummed. I'm saddened when this happens, of course, but when you

deal with wolves you have to deal with death. They die a lot and they kill a lot, so death is kind of an everyday thing. But I'm very attached to their well-being as a population and there are certain individuals that you identify with. The last wolf that died from the original reintroduction was in 2004. That was kind of the last link I had to the beginning. Back then I thought, "Well, jeez, we've been through all this together," which was a weird thought. I was kind of bummed when that happened.

What were the principal factors that made the reintroduction such a success?

I think the main one was that Yellowstone was probably some of the best wolf habitat in the world, and there were no wolves there. The two habitat criteria for wolves, as I said, are protection from human killing and adequate prey. Yellowstone was just burgeoning with prey. The northern Yellowstone elk population was at record highs. In fact, there's a book chapter that looks at the amount of prey available to wolf populations across North America, and Yellowstone was the spot that had the most biomass available. It was at its highest point by far. So they had really good habitat and they had protection from humans, and those are really all they need. Those are the two keys. They just took off.

I've read a lot about the ecological effects occurring in Yellowstone's ecosystem now that this top predator has been reintroduced. Could you describe one or two of the most significant examples of these effects?

I think there are three or four so I'll try to keep it brief. One is that wolves definitely impact the elk. Not alone, but in concert with other things. Having wolves in Yellowstone is a huge relief because Yellowstone had a high elk density. Some people take issue with that and say, "Well, the number of elk in Yellowstone is within a thousand year variation, and so if you look at the last thousand years, elk are within that timeline in terms of variation." However, there were just a lot of elk and what that did was suppress other aspects of life. Wolves have been involved in elk population decline. They're not solely responsible for it, but have created opportunities for other life because elk were so dominant. The plants that elk eat and other animals that use those plants, like beavers and songbirds, are coming back. That's one very significant thing.

Another is when wolves kill an elk or a bison or a deer, other animals feed on it—scavengers. Wolves have had really strong effects on the scavenger community. Initially, after wolves were reintroduced, the coyotes declined; we also had a very dense coyote population. Then lastly, grizzly bears use wolf kills, in one case in Pelican Valley, extensively. All of the grizzly bear's foods are not necessarily secure. For example, whitebark pine is declining because of a disease that's been introduced called white pine blister rust. When bears can't get whitebark pine nuts, they tend to steal wolf kills. Those are four pretty significant ecosystem effects.

Because the reintroduction of the wolves was such a success, do you think we should duplicate this in more places?

I think so, but I think we should go slowly. Some people have gotten carried away saying things like, "Wow, it worked so good in Yellowstone. Let's take this success story elsewhere." I think that the groundwork that you have to lay needs to be extensive. You need to be very careful about the biological suitability of an area and, as importantly, the social suitability of an area. The Mexican wolf, which is a different subspecies of the gray wolf, was reintroduced in the southwestern United States after wolves were in Yellowstone and central Idaho. They're not doing that well, and I think the reason for this is that the social acceptance is lower. There are a lot of people there who just do not like them, and so they're killing them more, and the wolves aren't doing as well.

Wolves in and around Yellowstone are largely spreading only into Idaho, Montana and Wyoming, as if there's an invisible fence preventing them from going elsewhere. Is this really true, or can they disperse throughout the Rocky Mountain and Intermountain West?

The simple answer is that they can disperse throughout the Rocky Mountain West. That's a very simplistic answer. They have the ability to get there and they can move through all kinds of things, but they're not doing well at it. There are so many people who don't like them that they're getting killed along the way. The more corridors they have and the more linkages they have, the better they'll do. The only purpose those corridors and linkages essentially serve is to just give the wolves a way to go where they don't bump into people. We've had a wolf go to Morgan, Utah from Yellowstone. We've had a wolf go near Denver from

Yellowstone. So they certainly don't need pristine landscapes to move through, but that helps because they don't get killed as readily.

What do you know about Utah's plans for wolves to enter the state, and what are the major political issues that have influenced the state's policy toward the possible establishment of wolves here?

I don't know much about Utah's plan. I know there are political problems with it. They went through a process where they had a committee of people that were involved in making the decision on what to do, and I heard through several friends that the agreements they reached were not honored through political maneuvering, essentially. So all the work they put into making a fair and balanced plan essentially got negated because of politics. I don't know the details, but the people who were on that committee, the ones I know, were very disappointed. Utah is a state that's got a lot of agriculture, and agriculture and ranching interests are very much opposed to the wolves. If wolves came back, that is a problem that needs to be dealt with because if wolves are near livestock, occasionally livestock will get killed. And so the question is, "Are there places where wolves can live year-round, summer and winter, where they're not coming in contact with livestock?"

The other really big issue is hunting. I've read some accounts of people in Utah who feel that the wildlife habitat is receding there. It's being lost for various reasons and deer and elk are having trouble. Adding wolves to the equation is one more thing that would cause problems. Even if that's not the case in other areas of Utah, such as central and southern Utah where there's not as much development and maybe not as much impact on the habitat, I'm not sure it's good wolf habitat. But regardless, people would feel that they don't want to compete with wolves—you know, the "wolf ate my deer" kind of thing. So I think that hunting and ranching are the two biggest issues.

What would you like to see happen with the wolf and livestock conflicts?

I think the first thing I'd like to see is land use planning. In other words, identifying where wolves belong and where they don't belong. In regions that are remote and wild, where there is lots of public land, you have the wolves there and you'd try to keep the livestock out. I realize the sheep go into these areas in the summer, but the key is keeping some areas

wild and not used for livestock. That's a lot to ask, and a lot of people are opposed to that, but I think that's the key. I think it's not good to say wolves belong everywhere. Keeping them out of areas where there's a lot of livestock use is important. In the areas in between, that's really tough. In the areas we call the wildland-ranching interface, you're probably going to have to combine what we call non-lethal methods, which is basically how you husband your animals and how you take care of them. You're going to have to take more time protecting them from wolves, and occasionally wolves are going to have to be killed. I agree with a rancher when he says that wolves are a pain in the neck, because when wolves are around, you are going to have to work harder to keep your livestock from being killed. You might have to bring them in at night. You might have to put up electric fences. You may have to patrol or ride your livestock more. It will take more effort, and that would be in the places that are in between where wolves and ranchers coexist.

In Europe they have essentially eliminated depredation—in some areas, but not all. I don't want to get too carried away with this, but they eliminated wolf predation on livestock by combining human presence with guard dogs and some animal husbandry techniques. But our culture here is not intensive enough for that. We killed predators in the West so they could turn livestock out on what we call open range. We just turned them loose in the mountains. To do that, you had to kill all the predators, and that's what we did. So if you're going to have predators—and this isn't just wolves, but also coyotes, cougars, bears and bobcats—then you've got to watch over them. They're more prone to do that in Europe than here.

Are you aware of any major circumstances, such as climate change or natural resource extraction, that years from now could potentially have a negative impact on Yellowstone's wolves or its other large carnivores?

Yes, I guess I don't sleep well at night thinking about these things, but climate change worries me greatly. That's just going to reshuffle the deck for the planet. I mean, it's going to completely reshuffle it. What we're in right now, for example, is a greater than 10 year drought in Yellowstone. It's affecting the amount of snow and the rain in the summer, and that affects elk conditions, and that affects wolves. If that kind of thing continues and gets worse, it's not going to bode well for wolves in or out of Yellowstone. So that's a huge threat. When we went through climate

changes in the past—I'm talking about thousands of millions of years ago—it wasn't as fast as this one and animals could move around more. If the climate changes, they could go to the climate that is more favorable for them, whether it's south or north. They can't do that now, so that's a huge threat that I'm worried about. The wolves are largely confined to Yellowstone now. If something happens because of climate change, where are they going to go?

What is your opinion about the wolf hunts in Canada and Alaska, and how sometimes they have open shooting out of helicopters, virtually disassembling wolf packs every year?

I knew this question would come up at some point. There are two types of killing wolves. There's a harvest, which is what hunters do and we do for all kinds of wildlife. With wolves, there are enough of them and their populations are durable enough that they can sustain a harvest, if it's properly managed. You can kill a certain amount of them without really affecting their overall population. Wolf control is when you go in to kill most of the wolves, 80 to 90 percent. That's typically done from helicopters. Alaska has been involved in that recently. My feeling about that is that it's a last resort; it really should be a last resort. You should have exhausted all the other options in terms of management before you get to wolf control. I'm not against it, but I don't like it. I don't think it's a good way to share the planet with other wildlife, especially ethically. My brother, who's older than I am by quite a bit, is into the arts. He can't fathom shooting an animal by flying over it in a helicopter. You know, hunting is designed around fair chase, sportsmanship. Flying over them in a helicopter with a shotgun is not, in his mind, ethical. A lot of people are against wolf control because of that. Not because of the science behind it, which sometimes is defendable, by the way. There have been cases that have shown that wolves are keeping the prey population low. They call it a predator pit, and the way to release them out of this predator pit is to remove the predators.

Another big predator in the Alaskan situation are bears, and that oftentimes isn't discussed, but wolves tend to be blamed more. Another thing is that if your habitat isn't good, killing a bunch of wolves isn't really going to make much of a difference. What people tend to do is rush to judgment to use wolf control because it makes them feel good and it's easy. I think what they need to know is what is causing

the ungulate (hoofed mammal) decline. How many ungulates do you actually have? How many wolves do you actually have? So, in a few rare instances, I think wolf control is called for, but only rarely so. We have not dealt well with the ethics behind it. We just go and do it and say, "Hey, I live in Alaska. I know best." And I don't think that's the way it really should be done.

How close is the U.S. Fish and Wildlife Service to removing the wolf from the endangered species list? Could you describe the issues at stake and where this is headed?

Well, the issues at stake involve the guy who's in charge of that. He is a good friend of mine and a colleague, and he is desperate to get wolves delisted. He can't wait to do it. One thing that I should say at some point in the interview is that wolves are not a job, they're a lifestyle. You're kind of who you are because of what you do. I suppose everybody's like that to a degree. I have a stamp on my forehead because they really do affect my life. I guess this is true for a lot of jobs, but I know many marriages that have failed because of wolves. They're just so intense in terms of what you do. My friend's marriage failed partly because of that, and so he can't wait to get them delisted. One reason he can't wait to get them delisted is because then he's going to go do something else. He really believes, honestly, that they should be delisted. There are plenty of wolves and the state wildlife agencies are good at managing them. It's just that there are political battles over them that get in the way, so he's working diligently through trying to get them delisted. It's like a personal goal as well as a professional goal for him. I think the pieces are starting to fall into place, but there will probably be lawsuits and litigations.

What are your current and future plans for wolf research?

I think my two biggest ideas are some of those I presented last night at the talk. I'm fascinated by this, so to speak, under-the-hood look at them that nobody has done before; in other words, the composition of wolf packs and what the different roles are for different wolves in a pack. That's just fascinating to me, and no one has looked at that. It really says a lot about why wolves live in packs, and why wolves are social because they share and cooperate. Do these bigger males—males are 20 percent bigger than females—do a lot more in terms of territory defense? We don't see them defend territories very much, so it's really interesting

to look at. The other one involves the novel idea that wolves hit this limit and then socially control their numbers by a process called "self-regulation." That idea was first posed in 1967 by Canadian wolf biologist Doug Pimlott, and it's since fallen out favor. It's been rejected, and I think now we're seeing that he may have been right in some situations. So following through with that is also going to be very interesting to me. The last one relates back to a previous question. In Yellowstone, global warming is changing the relationship that wolves have to elk, given the declining condition in elk in early winter, a time when they should be in excellent condition. Watching that through time is absolutely fascinating to me. What will happen if we get two or three normal winters? Will everything reverse itself? What's going to happen each winter? This summer and last winter were the two driest I've seen since wolves have been in Yellowstone. What's this winter going to be like? These are all really fascinating questions to me, and because we have more than 10 years of data, what each year brings in terms of wolves killing prey is "super fascinating" to me.

Returning Wolves and Removing Mountains: Building on the Yellowstone Case to Create a New Approach to Civic Education

Alix D. Dowling Fink and N. Scott Cole

Abstract—This chapter explores how a biologist and a political scientist developed a new approach to civic education. To help prepare students for the complexities of citizenship in the 21st century, "Science and Civics in Action" used an interdisciplinary method that brought together content knowledge from both the science and civics curriculums. In addition, two central case studies—the reintroduction of wolves to Yellowstone National Park and mountaintop removal coal mining in Appalachia—highlighted the complexities and challenges of natural resource management in the context of a civic education course. This chapter describes Science and Civics in Action's origins, structure, content and class assignments.

Introduction

Discussions about the "greatest generation," "bowling alone" and voting trends take center stage in most civic engagement courses. But is knowledge related to these subjects essential to effective engagement by 21st century citizens? Do younger Americans need a new set of skills in order to be effective participants in the political process? In this chapter, we argue that teachers need to take a new approach to civic education. While older perspectives should not be abandoned, they need to be adapted to the current demands of the U.S. political system. This chapter describes a model for a different approach to civic education by outlining "Science and Civics in Action," a class that challenged students to integrate content knowledge from civics and science to better understand citizenship in the 21st century. This course model is grounded in a key premise: American politics is more complex in the 21st century than in earlier generations. Not only do citizens need to know about the Constitution and the three

branches of government, they also need knowledge related to science. To organize this course, a case study approach was utilized. Wolf reintroduction to Yellowstone National Park (YNP) was the featured case study the first time this class was taught, and mountaintop removal coal mining (MTR) was included in the second iteration of the course. In the following pages, we outline the origins, course content and structure of our Science and Civics in Action course and, in so doing, highlight one path created collaboratively by a biologist and a political scientist.

Course Origins

In August 2005, we participated in the American Democracy Project's (ADP) Stewardship of Public Lands seminar in Yellowstone National Park, and from that experience grew Science and Civics in Action. During this trip, we were affected by presentations dealing with wolf reintroduction, and each speaker reinforced our contention that future voters would need scientific and civic knowledge to navigate policy problems associated with natural resource management. It became clear during our visit that scientific issues were becoming central to American politics. In addition to using ideas from this Yellowstone experience, we relied on motivation from Science Education for New Civic Engagements and Responsibilities (SENCER). In brief, this organization focuses on connecting scientific and civic knowledge, in addition to advocating transdisciplinary teaching. From various SENCER conferences and programs, we were able to better design and deliver a multidisciplinary course.

When it came to finding a curricular home for Science and Civics in Action, we targeted our university's general education program, especially the senior writing seminar requirement that serves as a "capstone" experience for every student. Dubbed our "writing for citizenship" goal, all courses fulfilling this requirement involve students in the application of writing skills to civic issues. Thus, course learning objectives were

Grand Canyon of Yellowstone National Park.

designed to provide students with content knowledge related to citizenship and science, in addition to helping them develop writing skills. While the specifics of Science and Civics in Action are discussed below, more information about this class, including a topical outline, course syllabus and learning objectives, can be found on this book's companion Web site (adpstewardshipresources.pbworks.com).

Course Content

In considering the introduction of science content relevant to decisions students will make as citizens, it is hard to know where to begin given that science and technology and their applications intrude upon nearly every aspect of our lives. However, the goal of the course was not to address all science content, but rather to take students through a particular area and prepare them to then venture into other areas on their own. In focusing the course, the authors sought to provide science content relevant to natural resource decision making, such as the process that resulted in the reintroduction of wolves into Yellowstone National Park and the case of MTR. For citizens to make informed decisions about natural resource issues, what basic science content do they need to draw on and apply?

To provide a broad context to resource-related decisions, students in the course explored several key areas that meaningfully bridged the two cases, including a discussion of some key definitions that served as a starting point. Conservationist, preservationist, environmentalist, ecologist, conservation biologist: These terms are often used incorrectly and interchangeably by the media, but they have distinct meanings. Citizens who seek to engage resource-related issues need to understand this terminology in order to use it correctly, identify stakeholders and understand stakeholder positions.

The science segment of the course was primarily drawn from conservation biology, and the content from that field of study was first developed through a discussion of global biodiversity and the "sixth extinction." Scientists around the world agree that we are experiencing global species extinctions at rates not seen since the last great extinction event that claimed the dinosaurs. There are many causal factors associated with these species extinctions, and the course outlined these as the key threats to biodiversity both broadly (e.g., contamination of habitats) and specifically (e.g., habitat fragmentation and

edge effects). To help students understand the costs of species losses, we also explored the many benefits of biodiversity to humans, such as ecological services, economic and medicinal products, and opportunities for spirituality and education, to name but a few.

Building upon the foundation of biodiversity, we then examined population biology, a topic that underlies many natural resource issues whether the topic is sand dune management for Karner blue butterflies, dam release volume and timing for mudfish, or removal of grizzly bears from the list of endangered species. Though expertise in population biology is developed only with significant effort, even a basic understanding of some key components, such as the BIDE model, metapopulations and source-sink dynamics, provides students—as educated citizens—with scientific knowledge to engage key issues in the democratic process.

The reintroduction of gray wolves (*Canis lupus*) to Yellowstone National Park provided an exceptional case study for the application of basic science knowledge to a complex and charged natural resource decision. Wolves were absent from the Greater Yellowstone Ecosystem (GYE) due to overexploitation and persecution by humans. Returning wolves to the system promised many benefits—educational, economic, ecosystem services and spiritual—but it also presented potential problems for humans living in close proximity to the reintroduced population (e.g., livestock losses). Understanding basic population dynamics and community structure allowed students to begin to appreciate the role of the wolf in the GYE and, most importantly, to evaluate the arguments made by various stakeholders who played a role in the long process of the reintroduction efforts.

The mountaintop removal coal mining case required students to further build on and integrate these scientific concepts. For example, Appalachia is recognized internationally as a bastion of biodiversity, yet mountains—entire mountains—are being removed from the landscape forever. Students were challenged to apply their understanding of populations, communities, habitat requirements and other similar ideas to draw conclusions about the long-term effects of this process and to evaluate the arguments about mine reclamation. Additionally, this case provided a forum for integration of additional science content related to aquatic ecology and water quality

management. In regards to the latter, we arranged for our students to meet with a local expert and conduct some simple water quality assessments from a river that provides drinking water for our community. Thus, the MTR case added to the science issues and, as importantly, provided students with opportunities to further explore the ideas from the wolf case and apply information in a second, seemingly very different context.

In terms of teaching citizenship skills, we highlighted aspects of the American political system that were central to wolf reintroduction and mountaintop removal coal mining. Because interest groups played a vital role in both cases, a pluralist approach was used. According to pluralism, pressure groups organize and compete for power when their members feel threatened or when they want to impact public policy. While this perspective can be criticized for ignoring the resource bias of the interest group environment (Schattschneider, 1960) and for overlooking how interest groups can harm democracy (Rauch, 1994), it can be a useful teaching tool, especially when showing students how groups mobilize to influence politicians and the public. Our class sought to convey the perspective that successful citizens are the ones who create organizations to further their policy objectives.

However, we instructed students that collective action is neither automatic nor cost free. According to Mancur Olson (1971), group formation is difficult because potential members tend to "free ride." In other words, if my neighbor wants to stop MTR, why should I spend any of my time on this project? I will benefit from her efforts without exerting any of my energy. Therefore, citizens who want to mobilize groups need to understand that selective benefits must be offered to potential and current members. These can be material (a guarantee of a financial payoff for those who join), solidary (a chance to socialize with likeminded people) or expressive (the ability to further one's ideological objectives). But it should be noted that even with these benefits, groups sometimes fail to achieve their objectives (Woliver, 1993).

The Yellowstone case highlighted important factors related to interest group politics. In the struggle over wolf reintroduction, both sides of the debate used political organizations as they pursued their goals. Exploring their activities, such as writing letters to members of Congress, attending legislative

hearings, proposing legislation and attempting to shape public opinion, helped students understand how to influence public policy.

We also were able to highlight the role played by grassroots organizations in our class, especially when dealing with the MTR case. Over the years, people in Appalachia have organized their communities to stop mountaintop removal coal mining (Shnayerson, 2008). Because many Appalachians have less access to financial resources, they have utilized strategies associated with social movements, such as protesting and other non-traditional methods (see Tarrow, 1994), as they seek to influence public policy. One activist, for instance, walked from his home in West Virginia to Capitol Hill in Washington, D.C., to protest MTR. This was an excellent example for our students because it demonstrated how Appalachians have sought to defend themselves, which is something they have done throughout their history (see Fischer, 1993).

Our cases also demonstrated the importance of understanding state institutions. We presented the argument that America's political institutions were designed to prevent rapid change. The framers of our Constitution believed that radical reform would lead to political instability and the erosion of freedom, which motivated them to propose checks and balances and separation of powers among the three branches of government. These mechanisms were meant to slow the policymaking process by establishing various veto points where one branch could stop another. Citizens who understand this will be in a better position as they attempt to persuade politicians; they will realize, in other words, that it is essential to win the support of all three branches of government, in addition to recognizing that it takes time and patience to influence politics.

Science and Civics in Action also highlighted the roles played by bureaucratic agencies, such as the Department of Interior. To be effective in the political process, it is wise for people to understand the role played by these actors. They help make the rules and regulations that Americans must follow. A final point made in our class about institutions concerned the judiciary. In the wolf and MTR cases, stakeholders on both sides utilized the courts in their struggles. Thus, the message to our students was simple: if you want

to promote change, be prepared to enter the judicial arena as part of your strategy.

In addition, this class also explored how self-interest affects the American political system. Specifically, the Yellowstone case showed how lawmakers are driven by a desire to win and retain public office (Downs, 1957; Fiorina, 1989). In the past, Western politicians thought they would be voted out of office if they supported wolves. Recognizing this situation, wolf advocates attempted to demonstrate that lawmakers could win office by advocating pro-wolf policies. This point was demonstrated to politicians, as visitors to Yellowstone were allowed to cast votes for or against wolves (Fischer, 2003); this vote went overwhelmingly in favor of wolf reintroduction. For some politicians, this provided an incentive to change their opinions about reintroduction. This example showed our students that effective citizens are those who can frame their arguments in a way that helps politicians recognize the electoral benefits of supporting their ideas.

There was another way that the rational choice perspective was highlighted by this case. Specifically, in order to get ranchers to support reintroduction, Defenders of Wildlife proposed paying for animals lost to wolf predation. Once ranchers understood there was a financial safety net, some of them agreed to drop their opposition to this plan. While the rational choice model oversimplifies human behavior, it can be used to teach about politics and the policymaking process.

Finally, while not typically the focus of civic education courses, the subject of identity construction was covered. Specifically, to understand Appalachian politics, it is necessary to comprehend how identities are developed and used in the political process. Throughout the region's history, there have been attempts to define Appalachians as "backward," "hillbilly," "redneck," and out of touch with mainstream America (Shapiro, 1978). While some authors have sought to redefine Appalachia in a more positive direction (Biggers, 2007), stereotypes from Hollywood, such as The Dukes of Hazard and Deliverance, persist in the American mindset. In Science and Civics in Action, students were shown how these images affect the politics of mountaintop removal. For instance, environmental destruction in Appalachia is overlooked because it is happening to poor people, not the wealthy.

Furthermore, Appalachians who oppose MTR are dismissed by outsiders because they are perceived to be "ignorant" about the issues. Identity politics also played a crucial role in the YNP case, as actors on both sides tried to create images to help their side (e.g., rancher as an American icon) and drew on age-old stereotypes (e.g., wolves as vicious killers) to fuel divisive dichotomies (e.g., rancher vs. activist, wolf vs. cattle).

Course Structure

Since this course was developed within the structure of Longwood University's (Va.) senior writing seminar, students completed a series of writing assignments to better understand how public writing can be used by citizens to influence public discussions, including those focused on scientific and/or political issues (assignments are summarized in more detail in the course syllabus on the companion Web site).

Before drafting their own public documents, we first required that each student critically evaluate public documents for key rhetorical elements including audience, tone, constraints, purpose, etc. (see Ervin, 2003). Students analyzed one public document from the wolf case and another from the MTR case. In regards to developing their own documents, our students' entry point into public writing was a newspaper editorial, which was followed by a letter to a member of Congress. Topics for these pieces included the responsibilities of citizenship, biodiversity and local stewardship issues. In each semester, the third writing assignment—an open format piece related to the town hall meeting project (described below)—required that students identify a clear need for their writing skills and apply those skills appropriately. In response to these assignments, several students acknowledged that they had never before attempted to use written discourse as a way of influencing issues, and other students pondered the efficacy of such efforts, even as they noted the satisfaction of having a voice.

As a way of encouraging students to reflect on their knowledge and skill development during the course and throughout their college experience, students were required to prepare a portfolio project. Each portfolio included sections for major course assignments, and student progress in developing knowledge and skills was documented through the inclusion of draft documents, peer reviews and final drafts. Most importantly, the portfolio

included two written reflections in which students outlined their progress over the course of the semester, the ways in which the class incorporated skills and knowledge learned throughout his/her educational career at Longwood, and the application of public writing in civic life.

While writing assignments served an important role in developing individual content knowledge and skills, a significant effort of the class as a whole was the analysis of a local stewardship issue. Though study of Yellowstone's wolves and MTR provided insight into processes related to addressing and resolving contentious stewardship issues, educated citizens need to practice an invaluable civic skill: the ability to learn from other cases, identify transferable elements and develop strategies for their local issues. In this class, therefore, our students were required to select an issue related to the management and conservation of natural resources and conduct an independent analysis of the issue that involved research, writing and presentation of results. This process of applying lessons from the case studies to a local issue yielded interesting student reflections. For example, one student noted that she "learned that to get to the top, you need to start at the bottom, especially when dealing with politics." Another student noted that this class helped him better understand declining fish populations in a river near his home. After taking this class, the scientific issues made more sense to him, and he now understood how to participate more effectively in the political process surrounding the resolution of this resource challenge.

As a culmination to this analysis of a local issue, all students collaborated to complete a service project related to resource management. Specifically, the class organized and hosted a town hall meeting to which government officials, interest groups and the public were invited to discuss aspects of the local resource issue. The students developed a format for the meeting, invited participants, made arrangements (advertising, permission to use university facilities, sponsorship of post-meeting reception, etc.) and hosted the meeting. The first town hall meeting was focused on economic development and the environment, and guest presenters at the meeting were three Longwood faculty members (two biologists and a human geographer), Farmville's town planner, Prince Edward County's director of tourism and economic development, and the director of Longwood University's Small Business Development Center. The meeting was attended by approximately

100 students, faculty and staff, and local community members, including members of the Town Council. The second course offering was a town hall meeting (also well attended), which focused on our campus' sustainability efforts. Presenters included a faculty member, students, the vice president for facilities management and an official from Prince Edward County.

After we returned to the classroom, students made some interesting comments about how they were affected by the town hall meeting. According to one student, he felt powerless after listening to our guest speakers. There was a sense that nothing would get done and that politicians did not listen to average citizens. Another student, however, wanted to discuss additional steps that could be taken after the town hall meeting. While some expressed apathy and others wanted to take action, most of our students commented that they were satisfied by the exercise.

It should be noted, moreover, that when we taught this class the first time, students were offered an opportunity to travel to Yellowstone during spring break with the instructors. During this trip, in which 10 students participated, we visited with ranchers, scientists, park officials and activists, in addition to observing wolves and other wildlife. This experience allowed students to get first-hand knowledge of the wolf case; it brought the case to life and gave them a better sense of the scientific and political issues involved. After that initial spring break foray into the GYE, we have led three summer trips to Yellowstone as part of a hydrid-online version of the Science and Civics in Action course. The course model has evolved to include an intensive one-week immersion in the key issues in the GYE (bison management, bioprospecting, fire management, climate change, visitor use, etc.) during which students explore communities on the edge of YNP, talk with a variety of stakeholders and experience the natural wonders of the GYE.

Conclusion

When reflecting on this course, it is apparent that we pursued an ambitious agenda. Trying to develop a class that taught content knowledge in science and politics, in addition to writing, was a lofty goal. Looking back on the course, however, we agree that students learned many important lessons.

The success of this effort is further supported by the interest of our faculty colleagues in developing new iterations of the course focused on different focal topics. Citizens of the 21st century need to be presented with creative ways of seeing the scientific world in which we live. For civics teachers in America, this is a lesson that should be taken into consideration as curriculum plans are reconsidered and retooled for this century.

References

Biggers, J. (2007). *The United States of Appalachia: How southern mountaineers brought independence, culture, and enlightenment to America.* Emeryville, CA: Shoemaker and Hoard.

Downs, A. (1957). *An Economic theory of democracy.* London, UK: Harper Collins.

Ervin, E. (2003). Public literacy. New York, NY: Longman.

Fiorina, M.P. (1989). *Congress: The keystone of the Washington establishment* (2nd ed.). New Haven, CT: Yale University Press.

Fischer, H. (2003). *Wolf wars: The remarkable inside story of the restoration of wolves to Yellowstone.* Missoula, MT: Fischer Outdoor Discoveries, LLC.

Fisher, S.L. (1993). *Fighting back in Appalachia: Traditions of resistance and change.* Philadelphia, PA: Temple University Press.

Olson, M. (1971). *The logic of collective action.* Cambridge, MA: Harvard University Press.

Putnam, R. (2000). *Bowling alone: The collapse and revival of American community.* New York, NY: Simon and Schuster.

Rauch, J. (1995). *Demosclerosis: The silent killer of American government.* New York, NY: Times Books.

Schattschneider, E.E. (1960). *The semi-sovereign people: A realist's view of democracy in America.* Hinsdale, IL: The Dryden Press.

Shapiro, H.D. (1978). *Appalachia on our mind: The southern mountains and mountaineers in the American consciousness, 1870-1920.* Chapel Hill, NC: University of North Carolina Press.

Shnayerson, M. (2008). *Coal river.* New York, NY: Farrar, Straus, and Giroux.

Tarrow, Sidney. 1994. *Power in Movement: Social Movements, Collective Action, and Politics.* Cambridge: Cambridge University Press.

Woliver, Laura R. (1993). *From outrage to action: The politics of grassroots dissent.* Urbana, IL: University of Illinois Press.

Connecting Science and Politics to Promote Student Engagement in a General Biology Course

Margaret M. Avard and Bryon K. Clark

Abstract—After participating in the Stewardship of Public Lands seminar, a general biology course was restructured to increase student interest in both science and the political process by connecting course topics to position statements of presidential candidates. As a result of the modification, students appeared to be more engaged in science and the political process than in previous years. The following comment by one student summarizes what we believe to be a successful effort: "The link between science and politics in this class motivated me to learn more about all the presidential candidates. I am an older student and I probably know more about the slate of candidates this election than any other year. I wish more courses were structured this way."

Introduction

Students often are required to complete courses outside their major field of interest to provide breadth to their higher education experience. However, many students in non-major science courses fail to fully realize how science relates to the personal lifestyle choices they make. Therefore, the level of interest of students, and sometimes concomitantly of the instructors, in such courses can be minimal. The overall goal of this effort was to restructure a non-majors general biology course that had been taught for 19 years in a traditional lecture and laboratory format. Although the course has been modified throughout the years to integrate technology,

A grizzly bear crosses a highway in Cody, Wyoming.

use flashy audio-visual material and update content with new scientific breakthroughs, it remained a lecture-laboratory format. After participating in the Stewardship of Public Lands: Politics and the Yellowstone Ecosystem seminar, the course was redesigned to reduce lecture time, increase student-centered activities, and promote inquiry-based learning to increase science literacy, develop civic skills and promote civic engagement in students. The cornerstone of this initiative was to link science to politics by examining the viewpoints expressed by different political candidates during the presidential primaries of spring 2008. The public was often exposed to numerous scientific topics when besieged by political advertisements, debates and speeches during the campaign season. The change in course structure and delivery allowed students to take advantage of this readily available venue of resources to learn about science and become more involved in the political process.

Southeastern Oklahoma State University

Located in southern Oklahoma, Southeastern is a comprehensive regional university with about 4,000 students. Approximately 40-45 percent of the students are first generation; 40-45 percent must complete at least one remediation course; about 85 percent receive financial aid; and more than 30 percent are Native American. General Biology (BIOL 1114) is one of the two courses that fulfill the life sciences requirement of the general education program at Southeastern. The vast majority of the 400 students that enroll in this course each year major in fields other than science; in the past, students in this general education course have displayed, at best, a lack of interest in science, and, at worst, a complete disdain for the subject. The section of General Biology, targeted for this study in spring semester 2008, had 28 students (six freshmen, 12 sophomores, eight juniors, and two seniors) representing 14 different majors (plus three undecided).

Course Design

This one-semester course covered a diversity of biological topics; eight were used to connect science to politics (see Table 1). For each topic, abbreviated lectures were given, supplemental reading material was provided, and students were assigned different candidates to research and prepare a written

Table 1: Topics, Issues and Supplemental Readings		
General Topic	**Specific Issues Discussed**	**Supplemental Reading***
Science Literacy	National Science Standards, biological evolution, performance by U.S. students	Hazen (2002) . . . newfrontiers/hazen.html
Energy	Energy flow, non-renewable sources of energy, renewable sources of energy, fuel efficiency and transportation	Ekre (2002) . . .newfrontiers/elre.html
Biodiversity	Endangered species, extinction vs. mass extinction, habitat degradation and loss, conservation strategies	Eldrige (2001) . . . newfrontiers/eldredge2.html
Biotechnology	Stem cell research, DNA evidence, cloning, genetic engineering	Bereano (2000) . . . genomic/bereano.html
Human Health	Pandemics, child and adult obesity, Type II diabetes, cardiovascular disease	Morse (2004) . . . newfrontiers/morse.html
Human Reproduction	When life starts, genetic screening/testing, contraception, STDs	Glenn (2007) . . . genomic/glenn2.html
Agricultural Products	Organic vs. non-organic, genetically-engineered crops, chemical additives to food	Pusztai (2001) . . . biotech/pusztai.html
Environment	Global warming, pollution, human population concerns, changing personal lifestyle	Prato and Fagre (2006) . . . environment/prato_fagre.html

*Supplemental readings are located at actionbioscience.org.

summary of the candidate's position. Initially, candidates included four Democrats (Hillary Clinton, John Edwards, Dennis Kucinich and Barack Obama) and four Republicans (Rudy Giuliani, Mike Huckabee, John McCain and Mitt Romney). As individuals withdrew from the race, no new candidates were added. For each topic, students had the option to select different candidates as long as they were not assigned to other students (e.g., Bob Barr, Ralph Nader). By the end of the semester, all students had to research candidates from both major parties.

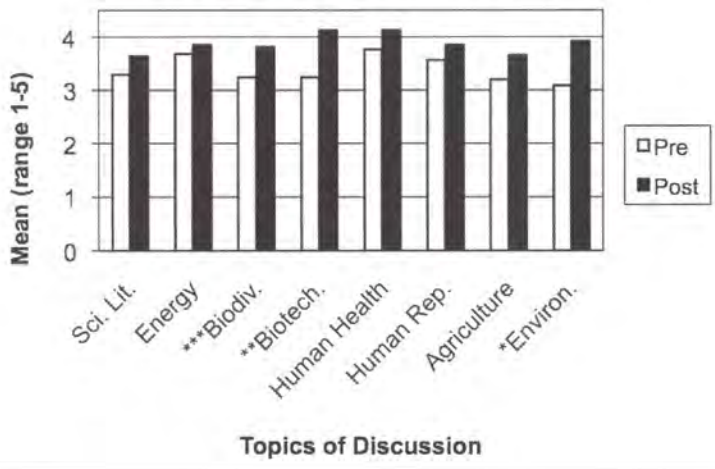
On discussion days, students met with other students assigned the same candidate, discussed their findings, prepared a group summary and gave

a brief oral synopsis of the candidate's position to the class. After each group presented their findings, the entire class discussed the topic and the supplemental reading. At the end of the class period, students voted by ballot for the candidate that best reflected their view on the topic. This process was repeated for each of the general topics. During the last regular class period, students discussed the science and politics portion of the course and then voted by ballot for the candidate whose position on only science-related topics most closely matched their views. Lastly, students were asked to cast their ballot vote for the candidate that they planned vote for in the general election.

Evaluation Protocols

Students were given tests and quizzes over the lecture material; they also received a grade for the laboratory portion of the course. At the beginning and end of the semester, students were given an anonymous survey concerning science and politics (see Appendix 1). Students also were evaluated on their written summaries of candidates' stances on topics; position paper on one of the supplemental reading assignments; oral presentation summarizing views of candidates; and class participation. At the end of the semester, students completed the Survey of Student Opinion of Instruction (Summa Information Systems, Inc., 2006) and were requested to provide written comments concerning the course.

Figure 1: Importance of a Candidate's Position on a Topic to Student When Considering for Whom to Vote (* = P < 0.05; ** = P < 0.01; *** = P <0.001)



Results

The importance of a candidate's position to students on each of the eight topics covered increased from the pre-course to post-course survey (see Figure 1). For three topics, biodiversity ($t = 5.92$, d.f. = 49, $P < 0.001$), biotechnology ($t = 3.03$, d.f. = 49, $P < 0.01$) and the environment ($t = 2.24$, d.f. = 2.24, $P < 0.05$), student responses were significantly higher for post-course than pre-course surveys. Biotechnology and environmental issues exhibited the greatest differences between the beginning and end of the semester (0.88 and 0.84 increase, respectively), only the average scores for biotechnology and human health ended above 4.0.

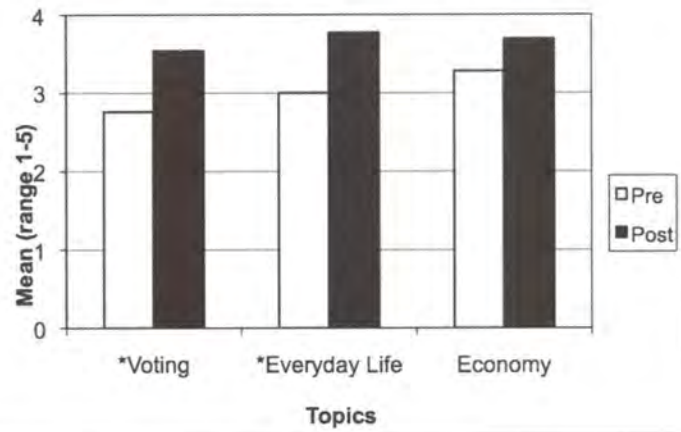
Students also were requested to self-report with no prompts the three most important factors they considered when selecting whom to vote for as the next president of the United States during pre-course and post-course surveys (Table 2). Students listed 29 different factors on the pre-course survey; 10 of these also were listed on the post-course survey, along with 22 different factors. The economy was listed by the greatest number of students as one of the three most important factors when deciding whom to vote for on both surveys; religious views of the candidate ranked second. Although some of

Table 2: Number of Student Responses to the Following Question: "What are the three most important factors that will influence whom you plan to vote for in the 2008 presidential election?" Topics were self-identified (no prompts) by students and only those listed three or more times are included.

Topic	Pre-Course Survey	Post-Course Survey
Economy	8	13
Religious views of candidate	6	6
Health care	5	5
Position on war in Iraq	5	6
Position on human/civil rights	5	5
Must be pro-life	3	0
Position on immigration (all stricter controls)	3	0
Plans to reduce cost of fuel (gas, oil, diesel)	2	3
Support for troops on foreign soil	3	0
Position of science in general	0	3

the 51 unique factors listed could not be readily connected to a science topic (e.g., leadership, honesty, gun ownership, swagger), many could and, where appropriate, these were included into classroom discussions.

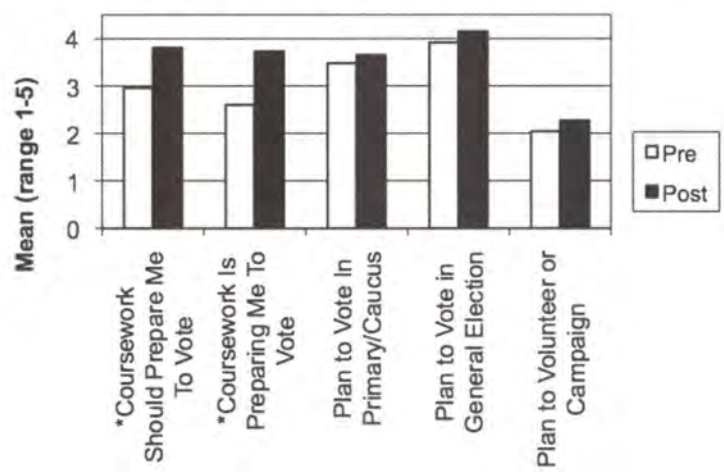
Figure 2: Importance of Being Science Literate for Voting, Everyday Life and the Economy (* = P < 0.05)



Student perception changed markedly concerning the importance of science literacy from pre-course to post-course surveys (Figure 2). Significant increases were documented for the importance of science literacy to voting ($t = 2.30$; d.f. = 49, $P < 0.05$) and everyday life ($t = 2.49$, d.f. = 49, $P < 0.05$); these were almost double the non-significant increase noted for economy ($t = 1.37$, d.f. = 49, $P > 0.10$).

The survey contained several questions about college coursework and political involvement (Figure 3). At the end of the semester, significant increases were noted for the following two statements: (1) College

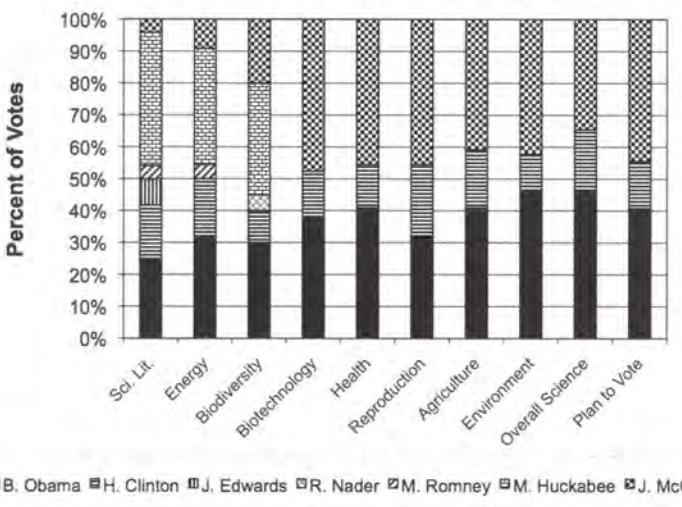
Figure 3: Relationship Between Coursework and Participation in the Political Process (* = P < 0.05)



coursework should prepare me for voting ($t = 2.58$, d.f., $= 49$, $P < 0.05$); and (2) College coursework prepared me for voting ($t = 2.65$, d.f. $= 49$, $P < 0.05$). Most students planned to vote in the general election prior to the course and no significant increase was noted. Similarly, most students did not plan to volunteer or campaign prior to the course and these patterns persisted.

At the end of each topic, students voted for the candidate that best reflected their views on that single issue. Throughout the semester, students voted for seven different candidates (Figure 4). As expected, the number of candidates receiving votes decreased as the semester progressed and candidates dropped out of the race. During the last vote at the end of the semester (first week of May), John McCain had secured the nomination of his party and was the only Republican that received votes. At the same time, the Democratic

Figure 4: Percent of Students Voting for Each Candidate by Topic; Candidates' Position on All Science Topics Collectively; and for Whom the Students Plan to Vote for in the General Election.



race was still being contested and both Hillary Clinton and Barack Obama received votes. During the semester 20 of 26 students (77 percent) reported that they voted for different candidates at least one time. More amazing was that 10 of 26 students (38 percent) reported that they voted for candidates from different parties at least one time when considering only a single issue.

Discussion days were challenging for both students and the instructor. During the first few weeks of the semester, several students were traumatized

by being assigned to candidates that they were opposed to. They did not want to present the position of a candidate whose point of view was fundamentally different than their own. Also, it was challenging to direct the discussion away from the typical rhetoric associated with a topic and personal attacks to a more in-depth and open conversation about the issue. By the end of the semester, however, students were more comfortable presenting the information, displayed more respect for others, and discussions focused more on science than sound bites.

Students evaluated instruction in two ways. First, students were asked to provide written comments concerning the course. Those specifically relevant to the science and politics portion are listed below:

- "I appreciated this class today and even more your encouragement to get involved with the election."
- "I am a senior and had put this class off for four years because I hate science. Even though I still do not like science, I have a much greater appreciation for it because of the instructor's use of presidential politics and other current issues to make science seem more relevant."
- "Overall this is an easy class. I really like the science politics. I wish there was less lecture and more demonstrations."
- "I looked forward to coming to class, especially when we discussed viewpoints of presidential candidates. Dr. Clark was an excellent professor!! He handled the controversial topics covered very diplomatically and allowed every student that wished to be heard speak."
- "The link between science and politics in this class motivated me to learn more about all the presidential candidates. I am an older student and I probably know more about the slate of candidates this election than any other year. I wish more courses were structured this way."

Students also completed the Survey of Student Opinion of Instruction at the end of the semester. The average student response regarding instruction in this course was higher than the unit mean for courses with a biology prefix (26 of 33 items) and institutional mean (29 of 33 questions); to our knowledge, this was the only course structured and delivered in this manner

on campus. Furthermore, when responses to statements were pooled into six categories, average scores received in this course were significantly higher ($P < 0.05$) than national means for *instructor preparation and organization* (4.71 out of 5.00 vs. 4.39) and *course objectives* (4.43 vs. 4.36); slightly higher for *instructor commitment to student learning* (4.5 vs. 4.36) and *testing* (4.55 vs. 4.27); and slightly lower for *instructor/student interaction* (4.03 vs. 4.06) and *course assignments* (4.21 vs. 4.23). For these same six categories, average scores for this course were higher than both the unit and institutional means.

Summary

Southeastern's mission statement (SE.edu) includes the following:

> *"Students will develop the skills and habits that promote values for career preparation, responsible citizenship, and lifelong learning."*

This course promoted the university's mission by increasing the students' perception that coursework should prepare them to vote and that coursework did prepare them to vote. Furthermore, the importance of being science literate for voting and everyday life increased during the course. Although anecdotal, students appeared to be more enthusiastic about a different course format, and more interactive in discussions; they also were more engaged in the course, evaluated preconceptions about science, developed an appreciation for the importance that science has in everyday life, and practiced a greater diversity of civic skills.

The Yellowstone Seminar was the seminal event that prompted changes in the design and delivery of a general biology course. Many topics discussed in this course elicited strong emotions from the students (e.g., stem cell research, evolution, contraception, population growth, endangered species, oil drilling and exploration, alternative energy), similar to the topics and interactions witnessed during the Yellowstone Seminar. The design of this course more actively involved students in realizing the pervasiveness of science in personal lifestyle choices by making them research stances taken by various political candidates, not only for those that they agreed with, but for candidates with different viewpoints as well. We hope that students will exhibit a greater sense of social responsibility and civic engagement in the future as a result of their active participation in this course.

Although presidential elections only occur every four years, there are a variety of other ways to redesign a course to accomplish the same basic goals. Case studies about issues that pose a moral dilemma—many of which were discussed during the presidential primaries—can still be used (e.g., cloning research, stem cell research, evolution, endangered species), and a wealth of Internet resources are readily available. Personal health issues (e.g., smoking, Type II diabetes, obesity, safe drinking water, cancer, genetically modified plants and animals, nutrition) also tend to engage students better than simply scientific facts. Currently, faculty in the department of biological sciences at Southeastern are discussing the potential benefits of changing the format for all sections of the General Biology course to a more issues-based approach that would better engage students.

Appendix: Survey Used to Assess Students' Views About Science and Politics

This is an anonymous survey concerning science and politics. This is not a test with right and wrong answers; your opinion regarding each of the statements is desired. On the front and back of the form you will find 46 statements. Respond to each by completely filling in the appropriate circle. Respond to each based on your point of view using the following scale:

A=strongly disagree; **B**=slightly disagree; **C**=uncertain; **D**=slightly agree; **E**=strongly agree

- A presidential candidate's position on promoting a scientifically literate society is important.
- A presidential candidate's position on energy-related issues is important.
- A presidential candidate's position on biodiversity and species extinction is important.
- A presidential candidate's position on biotechnology issues and their use is important.
- A presidential candidate's position on physical fitness and human health issues is important.
- A presidential candidate's position on human reproduction issues is important.
- A presidential candidate's position on how agriculture products are produced is important.
- A presidential candidate's position on global climate change is important.
- A presidential candidate's position on education is important.
- A presidential candidate's position on the environment is important.
- A presidential candidate's position on healthcare is important.
- A presidential candidate's position on the economy is important.
- A presidential candidate's position on entertainment and recreation is important.
- A presidential candidate's position on religion is important.
- A presidential candidate's position on national security is important.
- A presidential candidate's position on human and civil rights is important.
- A presidential candidate's position on neighborhood/local issues is important.
- A presidential candidate's position on international issues is important.
- Students should not be required to take science courses in college.
- Less emphasis should be placed on science in elementary school grades.

- Less emphasis should be placed on science in the secondary school grades.
- Science should be taught in all grades in public schools.
- Religion and science almost always are at odds with each other.
- Politics and science almost always are at odds with each other.
- Scientific knowledge influences governmental decisions too much.
- Politics tend to impede scientific progress.
- I enjoy interacting with individuals from diverse backgrounds and other cultures.
- I am not tolerant of others that have different points of view.
- Religion tends to impede scientific progress.
- Governmental decisions should be more based on scientific knowledge than they currently are.
- Areas of scientific research should be determined by its potential impact on the economy.
- The government should not fund scientific research.
- Being scientifically literate is important when selecting whom to vote for.
- Being scientifically literate is important to live in today's society.
- A scientifically literate society is important to the U.S, economy.
- I have followed the presidential primaries and caucuses this election year.
- I am knowledgeable about most presidential candidates this year.
- I am knowledgeable about the views of presidential candidates concerning science-related topics.
- Scientists should only conduct research in areas approved by the government.
- I enjoy discussions with other individuals who have different points of view.
- I am uneasy when I am around individuals with different backgrounds and from other cultures.
- My college coursework should prepare me to participate in politics (vote, volunteer, campaign).
- My college coursework is preparing me to participate in politics (vote, volunteer, campaign).
- I plan to vote in my state's primary election in spring 2008.
- I plan to vote in the general election in fall 2008.
- I plan to volunteer, raise funds, or actively campaign for a political candidate this year.
- In the space below, what are the three most important factors that will influence whom you plan to vote for in the presidential election (list them in order of importance)?

1. _____
2. _____
3. _____

Developing a Student-Centered Environmental Law Class to Encourage Student Engagement and Civic Learning

Margaret M. Avard and Bryon K. Clark

Abstract—After attending the American Democracy Project's Stewardship of Public Lands seminar at Yellowstone National Park during the summer of 2007, the authors redesigned an environmental law course to incorporate student-centered learning techniques and expose students to local, often controversial, topics of interest. Students responded positively to the new course format, both on course evaluations and in their behavior in the classroom; there was much more active participation and the classroom became a lively learning environment. The Yellowstone workshop was an invaluable experience not only for acquiring knowledge about the Yellowstone ecosystem and being exposed to its local issues, but also for gaining an understanding of the value of student engagement and civic learning in any classroom.

Introduction

Attendance at the American Democracy Project's Stewardship of Public Lands seminar at Yellowstone National Park during the summer of 2007 was an invaluable experience in learning new techniques for incorporating student engagement and civic learning into the classroom. During the seminar, participants were introduced to several local issues (e.g. bison, snowmobiles, wolves) and then divided into two groups. One group studied the bison/brucellosis issue, while the other examined the issue of snowmobile use in the park. Both groups were fortunate to

Bison grazing in Yellowstone National Park.

hear speakers representing different sides of each issue. This gave a whole new perspective to the topics. It is one thing to hear about an issue from an objective third party, and quite another to hear about both sides of an issue from the actual stakeholders who are passionate about their positions. This manner of learning had a strong impact on us as teachers. It was an eye-opening experience that made us contemplate how we could incorporate similar experiences into our classrooms. The primary goal was to redesign an undergraduate environmental law course to expose students to local issues and make them more familiar with civic processes.

The semester after the workshop, we changed a previously lecture-only environmental law class to a more student-centered, civic-focused experience for students. Basic laws and principles had typically been taught in a lecture format. This included the Commerce Clause, the 5th and 14th Amendments, and many of the major environmental laws: Clean Air Act (CAA); Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA); Asbestos Hazard Emergency Response Act (AHERA); Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and its amendment, the Superfund Authorization and Recovery Act (SARA); Toxic Substances Control Act (TCSA); and Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA). After redesigning the course, each law was covered using new, student-centered methods. Several other activities were also incorporated into the class, including a mock Congress based on the wolves of Yellowstone, mock trials and debates about local environmental issues. The new class has now been taught twice, and students with majors in wildlife conservation, occupational safety and health, and environmental science are the primary enrollees.

Description of Activities

What Chaps Me?

The first day of class, students were asked to describe a topic that really got on their nerves. They then had to research their stances and find several organizations that supported their viewpoints. Topics of annoyance included drilling for oil in Alaska, whaling, litter, global warming, NAFTA, medical

marijuana, pesticides, gun bans, exotic animal trade, and urban sprawl. As a result of this activity, several students were motivated to join organizations such as the Sierra Club, the National Resources Defense Council and the National Rifle Association.

Computer Assignments

For each environmental law, a research activity was designed to expose students to resources that could be found on the Internet. Activities centered on information relevant to each of the laws. For example, during the assignment for the CWA, students visited the Environmental Protection Agency (EPA) Web site (epa.gov) and calculated their average water consumption (the entire activity is shown in Table 1). Many assignments included exploring information relevant to a law on the EPA Web site. Other Web sites visited included the Council of Environmental Quality (whitehouse.gov/ceq/); NEPA Net (ceq.hss.doe.gov/nepa/nepanet.htm); Toxic Release Inventory (epa.gov/tri/); Federal Register (gpoaccess.gov/fr/); Zero Waste America (zerowasteamerica.org/); and the National Priority List (epa.gov/superfund/sites/npl/). Other Web-based activities included visiting sites to learn how to correctly cite law cases, finding non-attainment cities in the U.S. (with respect to air pollution), looking up environmental impact statements, locating air pollution alert days, calculating how much carbon dioxide students emit daily, determining emissions from students' cars, finding recycling rates for states, and sketching a diagram of a sanitary landfill.

Debates

A series of debates about local issues was held. Two students, one for and one against the topic, were involved in each debate. The topics were all complex and controversial in nature and included the following concerns:

- Sale of Arbuckle-Simpson Aquifer water to Oklahoma City
- Proposed wind farm in the Wichita Mountains (Oklahoma)
- Proposed coal-burning power plants in Texas
- Sale of Oklahoma water to Texas
- Vertical expansion of a local landfill
- Promotion of water conservation
- Proposed natural gas pipeline

Table 1: Internet Activity for the Clean Water Act

Clean Water Act Activity

I. Go to epa.gov/safewater and click on "Public Drinking Water Systems." Then find "Water System Facts and Figures." Focus on the tables in FY 2007 Annual Statistics (consider CWS only):

1. What size are most systems? Do most systems use ground water or surface water? Which serve the highest population?
2. Oklahoma—How many systems are ground water? Surface water? What population is affected by violations?
3. Texas—How many systems are ground water? Surface water? What population is affected by violations?
4. What is the total population affected by violations in 2007 (CWS Violations reported by FY)?
5. Injection Wells—Oklahoma – What are most of the injection wells used for?

II. Go to epa.gov/safewater/mcl.html.

1. a. How many microorganisms are listed? Name one and what problem it can cause.
   b. Disinfectant by-products? Name one and what problem it can cause.
   c. Disinfectants? Name one and what problem it can cause.
   d. Inorganic chemicals? Name one and what problem it can cause.
   e. Organic chemicals? Name one and what problem it can cause.
   f. Radionuclides? Name one and what problem it can cause.
2. Name four secondary standards.

III. Go to toxics.usgs.gov and click on "Site Remediation, then "Toxic Program Remediation Activities," then "Testing of Remediation Technologies," and then "Can Trees."

1. What is phytoremediation? Which type of plant is being used to clean up which pollutant?

IV. Go to ok.water.usgs.gov and paste these search terms into the search box on the right side of the Web site: "Monitoring of Nitrate and Pesticides in Water in Chickasaw Nation."

1. Of 17 wells, how many had nitrates? Pesticides? Did any wells exceed the standards for nitrates?
2. Go back to ok.water.usgs.gov and search "Climatology of OK"
   a. What is the average range of precipitation in the state? When are the peaks? What is the primary source of moisture?
3. *Norman Landfill Toxic Hydrology Research Program*
   a. What is the landfill contaminating? What are they afraid that it *will* contaminate?
   Maps—Location of Data Collection Sites and Photographs
   What direction is the leachate plume moving?

V. Go to ga.water.usgs.gov/edu/sq3.html

1. Answer Questionnaire #3. Fill out the survey. How many gallons of water do you use per day? How much water does a flush use? A shower? Running the dishwasher? A load of laundry?
2. Answer all of the Challenge Questions . . .
   a. #1—How many gallons of water does it take to make a hamburger? Tomato?
   b. #2—If two acres get two inches of rain, how many gallons of rainwater is that?
   c. Take the two quizzes—How many did you miss on the Water Properties quiz? Ground Water quiz?
   d. #5—If two faucets in your house were dripping 30 drops per minute, how many gallons per day would be wasted? How many gallons per year?

- Tar Creek Superfund Site
- Chicken farms in southeast Oklahoma and Arkansas

On a pre/post test, students were asked to give local examples based on different environmental laws.

Mock Trials

Students were divided into groups of three (prosecuting lawyer, defense lawyer, judge) and required to read, research and present a case to the class. Each case was based on a different environmental law or policy and included the following concerns:

- Arkansas v. Oklahoma—CWA
- Avoyelle's Sportsmen's League, Inc. v. Marsh—CWA
- City of Philadelphia v. New Jersey—Commerce Clause
- U.S. v. Waste Industries, Inc.—RCRA
- Vermont v. Thomas—CAA
- U.S. v. SCM Corp.—CAA
- Corrosion Proof Fittings v. EPA—TSCA
- Love v. Thomas—FIFRA
- U.S. v. Aceto Agricultural Chemicals Corporation—CERCLA

Groups gave their presentations using two main styles. Some had the judge review the background of the case, had each lawyer do an overview for their side of the lawsuit, and then had the judge give the final decision. Other groups had the judge introduce the case, the two lawyers would argue their cases back and forth, and then the judge would give the final decision. The presentation style seemed to be dependent on public speaking ability and how comfortable the group members were in front of a class. The second style definitely made for a more interesting, exciting trial, and better kept the class's attention. Whatever the scenario, students in the class needed to know the name of the case, what each side was arguing, and the final outcome of the case for the exam.

Mock Congress

Students were required to participate in the legislative process using the delisting of wolves in Yellowstone. The same topic was used during two

different semesters. In addition to participating in the activity, students also had a written assignment based on their roles. A blind drawing for roles was held; roles included lobbyists, subcommittee members and members of Congress. First, lobbyists (for and against the protection of wolves) presented information to subcommittees of both the House and Senate.

Table 2: Final Bills Proposed During Mock Congress Activity

Semester	Final Proposed Bill
Fall 2007	• Allowed the issue of hunting permits to ranchers with livestock grazing on lands bordering the park; • The number of permits per year would be based on elk and wolf populations; and • There would be a requirement that all kills be reported to park officials.
Fall 2008	• Lottery ($200) system for tags, money goes into conservation, 200 tags; • Hunt held only in areas with large wolf populations (>3,000)*; • Yearly review of wolf population and effectiveness of policy; • Ranchers may kill wolf if known to be killing livestock, must call biologist to verify; and • Very strict fines and/or jail time.

*Note: The only location in the contiguous U.S. that this actually occurs is in Minnesota.

The subcommittees then each proposed a bill and presented it to the House and Senate. Since both the House and Senate passed different bills, it was necessary to convene a joint session of these bodies in order to reconcile the two bills. A final bill was eventually agreed upon (Table 2).

Interestingly, both classes proposed similar bills. The majority of students in the class were, however, wildlife conservation majors and as such, might be expected to have similar viewpoints. During 2008, several announcements were made concerning the wolves under the Endangered Species Act, and during the fall semester several exciting things happened. First, wolves were officially delisted (with a monitoring plan in place) in February 2008. In July, September and October, lawsuits were filed that forced the delisting to stop (by court order). After much protest and public outcry, the wolves were again listed in December. This was fortuitous timing for students; they had researched the issue and were well-versed in the issues relating to these decisions. The mock Congress became an ongoing activity that lasted much of the semester rather than simply being a one-time endeavor.

Homework Assignments

Various homework assignments were given to further engage students in civic learning opportunities and help them understand our nation's environmental laws. They included:

- Reading, and writing a summary for, a chapter in Rachel Carson's book, *A Silent Spring;*
- Visiting the Library of Congress Web site and describing several bills currently in Congress;
- Researching and summarizing the stances of the 2008 presidential candidates on key environmental issues;
- Comparing the energy inputs and outputs of various biofuels to determine which crops make the most efficient alternative fuel source; and
- Discussing current events in the environmental field.

Results

It is difficult to assess student learning in a class of this type. Certainly, students were much more involved during class time than they had been in the past. There were many lively discussions and several students joined organizations as a result of their research. This is a very important outcome; many students in this area of the country do not have good verbal communication skills, so the class participation aspect was extremely beneficial. Class evaluations, overall, were very favorable in support of the hands-on nature of the class. On in-house student evaluation forms, the course received significantly higher scores on 26 out of 42 questions than for evaluations from the same class over the previous four years. From a faculty perspective, even though these results are largely anecdotal in nature, the civic learning techniques incorporated into this class were highly effective and beneficial for student learning.

What Chaps Me?—Students enjoyed having the opportunity to share something that really bothered them. Several joined organizations as a result of this activity.

Computer Assignments—Doing research on the Internet allowed students to really investigate the resources that are available online. Several of the activities were also designed to help students realize the impact they have on the environment by looking at their everyday activities; they investigated their water usage, fuel efficiency of their vehicles, and their carbon dioxide output.

Debates—The debates were eye-opening experiences for many of the students. On a pre-/post-test given during the fall 2008 semester, students were asked to give examples of local issues based on various environmental laws. The most dramatic example was for the NEPA. On the pre-test, no students could give an example of a local issue based on the NEPA; however, they could all give an example on the post-test. Other laws asked about on the pre-/post-test were the CAA, CWA, RCRA and CERCLA. On the pre-test, students typically gave general examples (such as car emissions or air pollution from a manufacturing plant). On the post-test, however, answers were much more specific: pollution from coal burning power plants in Texas blowing into Oklahoma; haze over Durant caused by air pollution being blown northward from Dallas.

Mock Trials—Law cases can be difficult to read and assess, so this activity gave students the opportunity to do this using a more focused approach. By having a specific role in the trial, each student could read the case with an eye for the information he or she needed to be able to adequately address his or her side of the case in court. With this approach, students did not get as confused and overwhelmed by the written case report and were better able to grasp the intricacies involved in their cases.

Mock Congress—Students did an excellent job researching the topic, which made going through the legislative process especially rewarding. In a pre-/post-test given during the fall 2008 semester, students were asked to describe how a federal statute is passed. Table 3 depicts select student answers at the beginning and the end of the semester. At the end of the fall 2008 class, students were also asked who were the most influential people in the legislative process: lobbyists, subcommittee members or members of Congress. Interestingly, the higher the student's overall grade in the class, the more likely the answer was lobbyists. When asked why they felt this way, all

Table 3. Select Student Answers to the Question, "Describe How a Federal Statute is Passed (i.e., how Congress makes a law)" at the Beginning and the End of the Fall 2008 Semester.

Pre-Test	Post-Test
Bill is sent to House or Senate. Meetings are held concerning bill. May get passed into a law?	An issue is introduced to the House, Senate or both. Each entity discusses it and decides whether or not to pass it. Subcommittees for each may also be used to come up with a proposed bill. Once both parties agree, the proposed resolution becomes a law.
Bill is presented. Congress votes?	Lobbyists push issue to House and Senate (separately). House and Senate decide what should be done (separately). House and Senate come together and decide what is to be done. If agree, statute is passed; if not, the process starts all over.
Don't know.	A bill gets proposed to the House, Senate or both. Then the House and Senate give the bill to the subcommittees and the lobbyists present the info to the committee members. Once the subcommittee has reached a decision, then it can go to the reconciliation members. That is where they either combine parts of the House or Senate ideas into one or they pick the House or Senate idea. Once they have the bill written out it goes to Congress and they can make it a statute (law).
Proposed, goes to a committee, then revised in the House, goes to another committee and is reviewed by the Senate.	It is introduced to Congress either through the House or Senate or in both. It is sent to a committee and lobbyists present their ideas on the statute, either for or against. The committee then presents it to the House and Senate again and they come to a conclusion. If the statutes are not identical, they then form another committee to make compromises in order to finalize the statute. It is then voted on and if passed sent to the president.

of the students that had chosen members of Congress answered, "Because Congress has the final say (vote)." Those who chose lobbyists had a variety of explanations, including that lobbyists have the ability to sway votes; have the power to raise large amounts of money; are very well-informed on matters; represent the voice of the people and can raise awareness; and are paid to sway members of Congress.

Homework Assignments—In general, students did an amazing job on the homework assignments. They clearly did significant research and put a lot of thought into the assignments. *The Silent Spring* assignment helped students better understand motivations behind the passing of the major U.S. environmental laws of the 1970s. The Library of Congress activity allowed students to access bills in areas of importance to them and determine

if they had become law, were stuck in committee somewhere or had been tabled indefinitely. Learning the stances of the presidential candidates was especially relevant during the 2008 election year. One of the most interesting assignments for students was comparing biofuel made from soybeans with biofuel made from corn. They learned that soybeans overall produced a much more efficient alternative fuel when considering all of the energy inputs and outputs (REF). Discussing current events in a field is always an enlightening experience for both students and instructor because of the large variety of topics discussed.

Summary

Redesigning the environmental law class was a challenging, yet extremely rewarding experience. Previously, the class was likely boring to students, but after revision became a more active, lively experience. As the instructor, it was difficult at first to give up the lecture format, but this soon became gratifying on several levels. First, students were much more participatory on a day-to-day basis in class. Second, they could really see the impacts of their actions on the environment. Third, their eyes were opened to the many local concerns that they had not previously given much consideration. Seeing this level of return from the modification of course format was extremely rewarding and is testimony to the effectiveness of student-centered teaching methods. Attending AASCU's Politics and the Yellowstone Ecosystem seminar was an invaluable experience not only for acquiring knowledge about the Yellowstone ecosystem and being exposed to its local issues, but also for gaining an understanding of the value of student engagement and civic learning in the classroom. It is hoped that, in the future, a more community-centered focus can also be added to the class so that students can become actively and directly involved with various local issues.

Avoiding the Tragedy of the Commons: Applying the Lessons of Yellowstone to the Great Lakes

Dawn G. Blasko, Jonathon Hall and Rod Troester

Abstract—The history and politics surrounding the founding and management of Yellowstone National Park provides a case study of the ways human values and attitudes about public lands and the environment influence and are influenced by the politics of the times. In an interdisciplinary course on the foundations of civic and community engagement, faculty in psychology, science and communications explored the concept of public lands beginning with Yellowstone and ending with the local case of the use and abuse of the Great Lakes Basin. Students explored the concept of the tragedy of the commons in which shared resources lead to overuse and possible destruction, while exploring ways to avoid this tendency. Course evaluations suggest that, on average, students began to see environmental sustainability as more important in their lives and are more likely to recognize that they have a responsibility to get involved to solve community problems.

Introduction

Beyond the roadside crowds of Yellowstone National Park are brilliant, dramatic and awe-inspiring landscapes. It is difficult not to be affected in some powerful psychological way, whether by the forces of the earth spectacularly bursting in scalding geysers and bubbling mudpots, or by the abundant plant and animal life that reminds us of a time before our expanding cities paved over much of the land. However, this amazing region has been racked by numerous problems

Seminar participants observe wolves at Slough Creek.

and controversies ranging from natural disasters, like fire and earthquake, to the far more damaging human devastation of poaching, pollution and over-crowding. Today, controversy spins around the management of the large animals many park visitors come to see.

Wolves were reintroduced to Yellowstone to restore the natural balance of prey to predator, yet many ranchers vow to kill them on sight. A century ago the few remaining wild bison were preserved, and now that the herds have recovered, they are slaughtered at the border of the park to prevent the possibility of the spread of brucellosis to other cattle in the area. An astonishing 1,116 bison—estimated to be a third of the total herd—were killed in the winter of 2007-2008 alone. Snowmobiling in the park provides winter income for residents of surrounding communities, but too many noisy and smoky machines threaten the air, interfere with wildlife and disturb the peaceful snow covered vistas. With these controversies and others, Yellowstone serves as an ideal natural laboratory for faculty and students in a variety of disciplines. It would be wonderful if every American student could visit Yellowstone and learn about the founding of the national parks and the very human dramas that continue to rage around their management. However, for most students this is not possible—especially for students from lower income families who are more likely to attend our state colleges and universities. Nevertheless, we can use the Yellowstone controversies as a model to apply to our local communities, where the debates over public land and water use have a vivid and immediate impact on our students' lives.

In this paper, we describe efforts at a small (4,500 student) campus of a major university, to engage students in the issues surrounding their own communities.

Civic and Community Engagement

Penn State's (Pa.) recently developed minor in civic and community engagement (CIVCOM) includes a requisite foundations course. Because the program is new, course sizes have been small (10 students in fall 2007, 14 in 2008). In 2009, the course was offered as a first year seminar and had a full class of 25 students. This interdisciplinary course is taught by faculty

in psychology, science, and communication, and begins with case studies relating to Yellowstone. For example, students learned about the snowmobile controversy and were asked to take the perspectives of different stakeholders (e.g., park rangers, local hotel owners, snowmobile dealers, city mayor, snowmobiler, environmentalist) in mock town hall meetings that culminate in attempts at negotiated compromise.

The Tragedy of the Commons

Garret Hardin, in a widely cited 1968 article in *Science*, used the metaphor of the tragedy of the commons to illustrate the delicate balance between the rights and needs of the individual and the community. For example, if a rancher adds cattle to his herd that grazes on the common pastures, he will personally benefit. However, as more and more cattle are added, the pastures are eventually degraded to the point where they are useless to everyone in the community. The moral of the story, therefore, is that individuals may be motivated by self-interest to exploit common resources such as public land, air and water, until the resources themselves are depleted and of no value to anyone. In class, we discuss the application of this principle to Yellowstone and the national park system, where too many visitors can degrade the very treasures that they have come to see.

To illustrate the idea of common resources in a way relevant to students in our region, we discuss the Great Lakes Basin Compact, an international agreement between the eight Great Lake states and the Canadian providences of Ontario and Quebec. The Great Lakes commission seeks to develop a healthy and sustainable resource and promotes research, communication and advocacy on key issues such as regulating and cleaning up toxic waste; developing better navigation and coastal protection infrastructure; and dealing with aquatic invasive species.

Although the motivation to satisfy self-interests remains a part of the human condition, we worked with students to explore a much broader conception of relational self-interest where we strive to listen and learn about the needs of others who share our resources in order to best satisfy all of us (Lappé & Du Bois, 1994). The objective is for students to see that the tragedy of the commons is not necessarily inevitable, and also that working towards the common good requires the mastery of the skills of civic engagement

(or what Lappé and Dubois term "the arts of democracy" [1994]). These include active listening, creative conflict, mediation, negotiation, political imagination, public dialogue, public judgment, celebration and appreciation, evaluation and reflection, and mentoring.

Controversy on the Great Lakes

The Great Lakes contain 20 percent of the fresh water on the surface of the earth and 90 percent of the fresh water in the United States. They provided inexpensive transportation systems and access to rich mineral and forest resources that led to heavy industrialization and rapid population growth. In a classic tragedy of the commons, the eventual result was severe environmental degradation. Many of the cities on the Great Lakes today—including Erie, Pennsylvania—are struggling with limited financial resources to mitigate the impact of years of unchecked development and industrial pollution. The Lake Erie bayfront, surrounded by the peninsula of the beautiful Presque Isle State Park, is now in recovery status after groups of local citizens battled for decades to stop companies from dumping directly into the lake (legally and illegally) and after years of lawsuits forced surrounding communities to upgrade waste-water treatment systems. Today, academic and citizens groups study the watershed and advocate ways to continue to improve water and air quality while realizing that economic recovery depends on the use of these same resources for tourism. As a milestone of this success, in June, 2008, 300 swimmers ranging from 14 to 76 years of age swam across the bay to mark its recovered status, a goal set 20 years before in 1988. As our students learn, controversies surrounding economic development and the local environment continue.

Two years ago, local developers proposed to build the country's largest "Tires of Energy Plant" on prime land on the bayfront (land previously owned by International Paper, a major employer and major polluter). The group, Erie Renewable Energy (ERE), proposes to recycle scrap tires into electricity. In response, an organization of concerned citizens formed the grassroots organization Keep Erie's Environment Protected (KEEP) to fight the construction of the plant. One of the founders of the group, Randy Barnes, visited our class and described how he had never been an environmentalist

or even politically active, but now felt forced to speak out for the well-being of his family, his neighbors, and for the children that attended school and played in fields adjacent to the proposed plant.

Over time the small grassroots organization began to build significant community support. They eventually partnered not only with local and national environmental groups concerned about the hard fought progress on the Erie Bayfront (e.g. The Sierra Club), but also with sports fishing and boating groups, hotel and tourism groups, religious groups, and health professionals concerned about the impact of air pollution on public health. They gradually gained the support of a variety of local and state politicians who recognized that the environmental concerns and health issues outweighed possible economic benefits.

The developers carefully framed the proposed plant as renewable "green energy" serving a societal good by reducing the number of waste tires. They intended to incinerate two million pounds of tires per day using a new "cleaner" fluidized bed technology, and the tires would be shipped to the plant on existing rail and truck lines. Some arguments in favor of the plant resonated with many citizens: the plant would serve a public good by making waste tires useful, and even more importantly, by producing good paying initial construction jobs, followed by 30-60 long-term positions. As the rhetoric became more heated and the opposition grew, the local newspaper urged the community to remain calm and remember the potential economic benefits. The developers met with local unions and promised that development of the plant would result in well-paid union jobs. In an area where manufacturing has been in decline, and high paying manufacturing jobs are disappearing, this often pitted neighbor against neighbor and friend against friend.

Developing Civic Skills

Throughout the course we focus on practicing the arts of democracy. Resonating most with students is the concept of relational self-interest, where service to others is integrated with the personal needs and values to shape the type of community that works. Coupled with relational self-interest is relational power. Students realize that finding power in public life requires one to work with others with common interests but also to learn about

and use the structures of political power. For instance, it is impossible to be disinterested in politics if you want to save your community from a serious health risk. In studying the local tires controversy, students saw how the citizens involved with KEEP had to learn to access the local power structure; harness the local media; and become well informed about the Department of Environmental Protection, local and state building regulations, and zoning requirements. In fact, it was these zoning regulations that have, as of fall 2009, stalled the progress of the plant; the local zoning board, upheld by a judge on appeal, rejected permission for a variance to allow the plant's 165-foot boilers and a 300-foot smokestack to exceed the established 100-foot limit. The emissions permit application has been pending for nearly two years.

This local case study has all of the elements of the controversies in Yellowstone—local interests and economic development and concerns about preserving common resources for future generations, but allowing tourism and recreation. We have grassroots organizations, corporations and national interest groups all attempting to influence local, state and federal government. To get a firsthand look at the bayfront, we took the students on two field trips. The first was to the Tom Ridge Environmental Center at the entrance to Presque Isle State park, where students learned about the ecology of the Great Lakes and Penn State's Sea Grant partnerships with other institutions and the community. Students participated in the International Coastal Clean Up on the beaches of Presque Isle, where they could see firsthand the impact of humans on the system as they collected and cataloged all types of garbage washed up on the shores. For the second field trip, we went sailing on a gorgeous fall day so that students could see Erie's renewed bayfront first hand. On the water we were surrounded by the peninsula of Presque Isle State Park, which although it is a major recreation area (with 13 beaches, marinas, and walking and biking trails), it contains areas of sensitive and protected wildlife habitat. While out on the water, we collected sediment samples. We learned how only 10-15 years ago most fish in the bay had multiple tumors, yet now this is extremely rare. Sailing was a first for all of our students, and surrounded by beautiful blue water and a cloudless sky it is hard to imagine that they did not grow in their appreciation for the Great Lakes ecosystem.

All of the students in the class also completed 20 hours of service-learning. In addition to the coastal cleanup, projects included collecting cans to recycle with the proceeds benefiting a local food bank; an effort to educate the college community about single stream recycling; and a series of environmental education programs that students designed and implemented in an afterschool program for 6th, 7th and 8th grade children in an inner city school.

Evaluating Our Efforts

So does all of this really have an impact, and if so, is it short or long term? One of the activities that we conducted near the beginning of the term involved administering questions from the World Values Survey that examined attitudes towards the relationship between humans and nature. According to data from the 1999-2002 World Values Survey (Leiserowitz, Kates, & Parris, 2005), when asked whether humans should master nature or coexist with nature, most Americans (over 75 percent) agreed or strongly agreed that we should coexist. Although overall quite positive, this value was considerably lower than many other nations. For example, over 90 percent of respondents in Japan and Sweden agreed that we should coexist with nature. At the other end of the spectrum were people in the Philippines, where respondents were equally split between those who felt we should coexist with nature and those who felt we should master nature.

In our classes, 45 percent of students either agreed or strongly agreed with the statement that humans should coexist with nature rather than rule over it. Over 90 percent felt that humans have a moral duty and obligation to living things in nature, and 80 percent felt we had a moral duty to nonliving things. Interestingly, although 72 percent of the class reported feeling that environmental problems such as global warming were serious concerns, none of those same students reported making any personal behavioral changes to address these issues.

This is consistent with national and international surveys where positive attitudes about the environment do not always lead to political action towards it. For example, in 1995, only 13 percent of a multi-nation study reported signing a petition, attending a meeting, or donating to

an environmental organization in the prior 12 months. In 2000, only 10 percent reported having written a letter or made a telephone call to express their opinion about the environment (Leiserowitz, Kates, & Parris, 2005).

Psychologists have studied the myriad reasons why attitudes and behaviors may not always be congruent. For example, in an arena as large as the environment there is both a feeling of powerlessness and a diffusion of personal responsibility. An individual may feel that since others share their beliefs, someone else is most certainly making those calls and writing those letters. They may think that one more letter or call can't possibly make a difference. Clearly, our students reflected this attitude at the beginning of the class, when 75 percent said that it was important to become involved in improving your local community, but only 20 percent said they had ever taken action. However, by the end of the class we did see some improvement. Previous research (Ritenour, Blasko, & Kosinski, 2006) has shown that students who completed a course that uses service-learning—in comparison to a similar course without service-learning—viewed the course and the material as more important and more relevant to their lives. Students who complete service-learning also feel more positively about the local community at the end of the experience than the beginning, and they also see more benefits and fewer costs of community engagement. Other work has found that service-learning can improve intercultural sensitivity (Fitch, 2004), attitudes towards aging (Dorfman, Murty, Ingram, Evans, & Power, 2004), advances in moral development (Leming, 2001), and help students develop more positive attitudes towards political and civic engagement (Primavera, 1999; Warchal & Ruiz, 2004).

As of this writing, the direct evidence from our current classes is tentative, since the CIVCOM minor and the associated course relating to public lands and the environment is only in its third year. However, from surveys and a content analysis of the students' reflective essays we can see glimmers of success. Students wrote six essays throughout the course reflecting on the course material and its relationship to their own lives. For the last essay, students were asked to write an environmental manifesto, describing how they feel about their role in the environment. All of the students felt that

their views had changed during the course. With the exception of one student (a botany major who considered herself an environmentalist at the beginning of the class), the class said that they had not given much thought to the environment or to public lands, and were generally disinterested in politics. Most felt that claims about global warming were either false or exaggerated, and a few even thought Pennsylvania could use a little warm up! However, all students reported that by the end of the class, they realized that climate change was a real issue and that pollution, habitat reduction and climate change are global environmental problems.

All of our students reported paying more attention to the news and to politics than before they took the course. During the course, we discussed the 2008 presidential election and all of our students said that they voted, most for the first time. Students were assigned to read the campaign Web sites and most also watched the presidential debates. Interestingly, they were often surprised at how what the candidate actually said did not match what they had heard in the media or in rumors from family and friends. In fact, respect for both presidential candidates, Barack Obama and John McCain, increased with more information. The essays also reflected that students realized that democracy did not begin and end with voting, but that democracy was played out in thousands of small ways every day, as ordinary people try to make their communities more livable.

The concept that students mentioned most frequently in their writing was relational self-interest, as they concluded that their personal interests could be meshed with what was best for the community. They no longer saw environmental protection as necessarily being at odds with economic development, and many picked up on the idea of a green economy, mentioned by both presidential candidates. Most importantly, students now reported making small behavioral changes (e.g., driving less, carpooling, recycling more, changing light bulbs) and argued that if everyone made small changes, it would add up.

Conclusions

It is not easy to make significant changes with a single course, or even with an entire minor. Many of us have engrained patterns of behavior and personal identities that have gone without challenge or reflection for years. Because one major objective of the course was to improve what Lappé and DuBois termed "the arts of democracy," we asked the students to reflect on their strengths and weaknesses. The most common weaknesses that our students identified were their abilities to engage in creative conflict and public dialogue. Most students (and we would guess many faculty as well) would prefer to avoid conflict at all costs; unfortunately, this also leads to avoiding discussions with friends and relatives on any topics where there is likely to be disagreement. By using role-play activities in case studies like those provided by Yellowstone, students (and faculty) have a safe place to practice the arts of dialogue and negotiation.

For students to become engaged citizens and community leaders, they must not only learn how to gather existing information, but also how to use that information in creative ways. As Hubert Humprey said, "Freedom is hammered out on the anvil of discussion, dissent and debate." If we in the academy are to become the stewards of democracy, then we need to model these skills ourselves and take on difficult issues and controversies that have no simple answer. We need to inspire students to have the passion to care about their communities and the political imagination to craft solutions and engage in creative conflict and public dialogue.

References

Dorfman, L.T., Murty S.A., Ingram, J.G., Evan, R.J., & Power, J.R. (2004). Intergenerational service-learning in five cohorts of students: Is attitude change robust? *Educational Gerontology,* 30, 39-55.

Fitch, P. (2004). Effects of intercultural service-learning experiences on intellectual development and intercultural sensitivity. *New Perspectives in Service-Learning: Research to Advance the Field.* Greenwich, CT: IAP Information Age Publishing.

Hardin, G. (1968). The tragedy of the common. *Science,* 162, 1243-1248.

Humphrey, H.H., & Hall, P.D. (1967). *The quotable Hubert H. Humphrey.* Ann Arbor, MI: Droke House.

Lappé, F.M., & Dubois, P.M. (1994). *The quickening of America: Rebuilding our nation, remaking our lives.* SanFrancisco, CA: Jossey Bass.

Leiserowitz, A.A., Kates, R.A., Thomas, & Parris, M. (2005). Do Global Attitudes and Behaviors Support Sustainable Development? *Environment,* 47(9), 22-38.

Leming, J.S. (2001). Integrating a structured ethical reflection curriculum into high school community service experiences: Impact on students' sociomoral development. *Adolescence,* 36(141), 33-45.

Primavera, J. (1999). The unintended consequences of volunteerism: Positive outcomes for those who serve. *Journal of Prevention & Intervention in the Community.* 18, 125-140.

Ritenour, T., Blasko, D.G., & Kosinki, C. (2006). An assessment of service learning: Student and faculty perspectives. Presented at the Teaching Seminar of the Association for Psychological Science. May 22-24, New York, NY.

Van Vugt, M. (2009). Averting the tragedy of the commons: Using social psychological science to protect the environment. *Current Direction in Psychological Science,* 18(3), 169-173.

Warchal, J., & Ruiz, A. (2006). The long-term effects of undergraduate service-learning programs on postgraduate employment choices, community engagement, and civic leadership. *New Perspectives in Service-Learning: Research to Advance the Field.* Greenwich, CT: IAP Information Age Publishing.

Building Concern for Public Lands in an Urban Coastal Environment

Donald Rodriguez and Scott Frisch

Abstract—This chapter highlights a comprehensive public lands initiative undertaken by various faculty members of California State University Channel Islands (CSUCI) following their participation in the ADP's Stewardship of Public Lands seminar. While CSUCI is a very young institution (est. 2002), it has a record of commitment to experiential and service–learning, and to interdisciplinary teaching and scholarship that makes these efforts more likely to come to fruition and serve as a model for other institutions. Specific academic strategies discussed in this chapter (infusing public lands themes into academic disciplines, incorporating faculty/student scholarship, and methods for institutionalizing the themes of public lands as a repository for the democratic process), may prove appropriate for a diverse range of college campuses.

Introduction

During the summer of 2004, the authors participated in the American Democracy Project's Stewardship of Public Lands seminar, hosted by the American Association of State Colleges and Universities (AASCU). The members of our team were initially unclear as to how this experience might translate to our university, which is situated in an urban California coastal setting, midway between the cities of Los Angeles and Santa Barbara. Although the counties that California State University Channel Islands serves are very populous, the university also enjoys being situated contiguous to Santa Monica Mountains National Recreation Area and has Channel Islands National Park as an offshore neighbor. Proximity to these natural resources has helped our faculty pursue various activities related to the Stewardship of Public Lands initiative.

California State University Channel Islands, established in 2002, is the newest campus of the CSU system. The mission of the university emphasizes

two aspects which dovetail nicely with the themes of the American Democracy Project and the Stewardship of Public Lands initiative: 1) interdisciplinary teaching, learning and scholarship, and 2) civic engagement through experiential and service-learning. The interdisciplinary element of our mission has been a strong emphasis of the campus since the start. Faculty are hired through an interdisciplinary hiring process (which evaluates each candidate's abilities to work across academic boundaries), and all students are required to complete nine units of upper division interdisciplinary course work. The civic engagement/service-learning element of our university mission was not as quickly embraced as part of our campus culture. However, the Stewardship of Public Lands seminar provided a spark for several members of our faculty. They proposed the concept of public lands as a unifying theme to take advantage of the already-developing interdisciplinary synergy and to jump start the mission-based initiative on service-learning and civic engagement. In this chapter, we describe how faculty members at CSUCI have used the Yellowstone experience to further our university's goals of interdisciplinary education and increased civic engagement.

Integrating Public Lands Stewardship and Civic Engagement at CSUCI

The campaign to create a public lands element at CSUCI began shortly after we returned from Yellowstone. Specifically, we were able to combine our interest in promoting environmental stewardship with our campus's annual reading celebration. In the fall of 2004, our reading program hosted environmental author Terry Tempest Williams and featured her book, *The Open Space of Democracy* (2004). Williams spent several days on campus, giving a public address as well as interacting with students in different classes. As part of this program, each incoming freshmen student received a copy of *The Open Space of Democracy*, and instructors across the curriculum

In conjunction with the USFWS shorebird conservation program, students in the ESRM 100 class erect fencing to protect the critical nesting habitat of endangered shorebirds on Ormond Beach.

incorporated the book into course syllabi. This event served to unify the campus by providing a collective intellectual experience around the topic of public land stewardship.

Using our campus reading program as a springboard for additional dialogue, the Center for Integrative Study and numerous academic programs hosted a Public Lands Celebration at CSUCI. Superintendents from the Channel Islands National Park and Santa Monica Mountains National Recreation Area joined with a local nature photographer to introduce students and the university community to the importance of protecting these local national treasures.

Following these events, there were numerous campus activities involving public lands. One activity included an art exhibit focusing on the Channel Islands; there were also several field trips to adjoining public lands and campus visits from natural resource managers. Topics discussed at these events included all elements of resource stewardship, such as protection of critical habitat for endangered species, park management strategies, resource conflicts, and the democratic principles inherent in public lands. The culminating event was a Channel Islands Symposium, "Understanding the Channel Islands: An Interdisciplinary Approach," which was co-sponsored by different academic departments and various campus entities. In addition, speakers representing the National Park Service, the NOAA National Marine Sanctuary, as well as former Congressman Robert Lagomarsino, joined in the effort. The symposium had over 200 people in attendance and was well-received by the university and the local community.

One of the most important outgrowths of the Channel Islands Symposium was the creation of an interdisciplinary research initiative: the Channel Islands Interdisciplinary Research Group. This collection of CSUCI faculty came together to facilitate transdisciplinary scholarship. The group includes more than 20 different faculty members representing 14 separate academic programs on campus. As part of this initiative, faculty members are engaged in a variety of research projects and collaborations designed to address diverse topics at the Channel Islands National Park and the Santa Monica Mountains National Recreation Area. Current projects involve a

broad array of topics, such as pesticide and heavy metal accumulation in benthic organisms; shorebird inventories and population monitoring; the history of island occupation; archeological studies; and the politics of park management. (For more information about this group, visit its Web site at ciirg.org).

Infusing a Public Lands Stewardship Theme into Academic Disciplines

The interdisciplinarity which characterizes our university facilitated the diffusion of the public lands themes throughout the curriculum. Faculty from the humanities, arts, social sciences and the natural sciences have collaborated to create a transdisciplinary learning environment where the stewardship of public lands theme has flourished. Below is a list of some of the major efforts on our campus, followed by a more detailed case study of one scholarly initiative and one pedagogical example.

To begin, one effort involved linking our introductory environmental science course and two sections of freshmen composition using public lands and wilderness as the unifying theme. Students were expected to participate in a common experience, such as a trip to Channel Islands National Park, and to then write about various conflicts associated with managing these public lands (eradication of feral pigs, endangered species protection, recreational use, etc.).

Political science faculty have also incorporated stewardship issues into their courses. For instance, as a component of the Congress and the Presidency course, students explored issues related to the opening of the Arctic National Wildlife Refuge (ANWR) for oil and gas exploration. In addition to helping them understand how to use the democratic process to manage natural resources, students participated in a simulated public hearing on ANWR in this class.

Also, new curriculum focusing on coastal management is currently being developed in collaboration with a local community college. Students at the community college will pair with CSUCI students to facilitate a coastal restoration project. In addition, this new emphasis will allow articulation

with nearby Oxnard College to promote stewardship awareness among underserved Hispanic students in the area. This coastal management program is being developed with the help of the National Park Service and involves all aspects of public lands management.

Moreover, CSUCI has joined the Council on Ocean Affairs, Science and Technology (COAST) within the California State University system. COAST—a new CSU initiative—was established to focus system-wide resources and provide vision, leadership and support throughout CSU for education, research and policy related to California's marine, estuarine and coastal regions. The alliance seeks to facilitate faculty collaboration within the CSU system to promote the dissemination of knowledge to the greater public, thereby promoting stewardship and ensuring the future sustainable use of California's coast. Three CSUCI faculty have begun a collaborative research project with CSU faculty at two other California State universities. A sustainability week is being planned that will focus the campus on issues associated with being designated as a "Green Campus" within the Cal State system. This week will involve members of the surrounding business community (CSUCI Business and Technology Partnership) who will explore unique opportunities for collaboration regarding sustainable solutions for the campus (a bio-fuels demonstration project, small scale solar applications, etc.).

Finally, the Yellowstone experience has likewise inspired a great deal of interdisciplinary research collaboration at CSUCI. Professors Scott Frisch and Dan Wakelee have explored the establishment of Channel Islands National Park as a case study of public policy making (Frisch & Wakelee, 2007). The authors explore the unlikely partnership between Robert Lagomarsino (R-CA)—the conservative Ventura county representative who introduced legislation leading to the creation of the park—and Phillip Burton (D-CA), the liberal San Francisco representative who chaired the key congressional subcommittee and was the driving force on the creation of Channel Islands and many other national parks. That one of the most liberal members of Congress was able to work closely with one of the more conservative members to overcome the obstacles preventing the establishment of the

park is instructive; it is an example of how people can find common ground within our system of government.

Institutionalizing the Stewardship of Public Lands Initiative at CSUCI

Our faculty have used CSUCI's interdisciplinary focus to help embed stewardship issues into the DNA of our institution. The following list highlights the success of this endeavor:

- Anthropology and Environmental Science: Human Ecology
- Communication and Environmental Science: Environmental Communication
- Environmental Science and Biology: Restoration Ecology
- Environmental Science, Communication and Political Science: Water and Conflict in the West
- History and Environmental Science: Environmental History
- Political Science and Environmental Science: Politics of the Environment
- Political Science and Biology: Science and Public Policy
- Political Science and Environmental Science: The National Parks
- Political Science, Communication and Environmental Science

Environmental Conflict Resolution

In addition to these courses, a new service-learning class focusing on the management of public lands is being developed. Through this experience, students will work directly with the National Park Service to resolve land management issues in the Santa Monica Mountains National Recreation Area and Channel Islands National Park. Also, our students are completing internships with the National Park Service's California Mediterranean Research Learning Center. Finally, we have also co-authored a grant with the National Park Service to pursue a formal university-Park Service partnership that will involve the creation of a Cooperative Ecosystem Restoration Project. Park Service resource scientists and managers will serve as co-instructors with CSUCI faculty on a variety of restoration projects. Students will learn valuable field methods while providing much needed field support for park projects.

The Yellowstone Seminar and Pedagogy

Public land issues provide excellent case studies for the analysis of policymaking in the American political system. Competing desires for environmental preservation, on the one hand, and development of land for economic purposes, on the other, provide rich examples of conflict that is inevitable in any society. These controversies also help students understand the need for government and its proper scope and authority. Such cases also provide opportunities for students to understand the complexities of policymaking and the necessity of compromise that is inherent in our system of government. At CSUCI, these themes and issues were explored using the case of Yellowstone National Park and its various natural resource controversies, such as the reintroduction of wolves to the park and bison management.

Building on the Yellowstone experience, professors Scott Frisch (political science) and Amy Denton (biology) developed a course called "Science and Public Policy," which will be taught for the third time in spring 2009. In addition to considering the Yellowstone case, this course also focuses on the future of the Arctic National Wildlife Refuge. Basically, this class examines instances where science and public policy intersect, including global warming/climate change, the Endangered Species Act, and the preservation or development of public lands. In accordance with our interdisciplinary philosophy, both the scientific and public policy aspects of the controversies are analyzed.

In the future, this course will feature a field trip to Alaska to experience ANWR (partially funded by an internal grant from student fee revenue). We will spend some time in ANWR, examining the arctic ecosystem and observing the annual migration of the Caribou, a species that would be impacted by oil exploration and development. In addition, we will visit a fishing village to speak with natives who support—as well as oppose—oil drilling in ANWR. Finally, we will tour the oil processing facility at Prudhoe Bay and hear from oil company representatives on the benefits of petroleum development. We will also meet with government officials who will provide their perspective on the situation. Just as the Yellowstone experience pits

various stakeholders against one another in a complex policymaking environment, ANWR provides an ongoing controversy with similar conflict and complexity with even less progress towards conflict resolution. It is our hope that this will be a life-changing experience for students.

Changing Students' Perspectives

One key element of the public lands stewardship project at CSUCI has been the transformation of students into public lands advocates and eager participants in field-based activities. Many of the students at CSUCI have urban lifestyles with little or no connection to the land. This project has served as a catalyst for stimulating student interest in a range of resource issues including endangered species conservation, management of critical habitat and resource protection. Students have been engaged in a variety of projects and class experiences that introduce them to the importance of resource stewardship. Participating students in the Snowy Plover Conservation Project, for example, help protect critical nesting habitat for a federally listed endangered species. Here students from various disciplines work with the U.S. Fish and Wildlife Service.

Students have also been directly involved through active internships with the National Park Service. One particular effort has been focused on rocky inter-tidal monitoring efforts along the Pacific Coast. As part of this project, students are responsible for re-establishing research transects and monitoring a variety of inter-tidal flora and fauna. Through experiences like these, we hope our students will be able to transcend their urban environments and begin to appreciate the importance of being good stewards of public lands.

Conclusion

Our faculty have created several unique opportunities to extend the American Democracy Project by building a stewardship of public lands strand into our campus culture. Collaborations with the National Park Service, the U.S. Fish and Wildlife Service, the Minerals Management Service and the Natural Resource Conservation Service have provided a variety of opportunities for

CSUCI students. Furthermore, in addition to promoting a stewardship ethic, collaboration among different disciplines has helped create an academic environment where our students can approach environmental issues from a variety of perspectives. This will help them as they attempt to understand the complexities associated with the management of natural resources.

References

Frisch, S.A., & Wakelee, D. (2007). "Politics and policy of national parks: The establishment and expansion of Channel Islands National Park." Paper delivered at Western Political Science Association. Las Vegas, NV. Mar 8.

Warren County Blueways: Adapting the American Democracy Project to Applied Student Engagement Among Pre-Service Outdoor Leaders

Tammie L. Stenger-Ramsey and Steven Logue Spencer

Abstract—The Western Kentucky University Outdoor Leadership Program faculty were the impetus for creating the Warren County Blueways project, a 180-mile water trail along the navigable rivers and creeks in the Bowling Green, Kentucky area. As part of the project, faculty and students worked with many local and state government agencies, private businesses and nonprofit organizations. The students collected GPS waypoints and took photographs of river access points and key features. That data was uploaded into a geographic information system (GIS) database and layered into a Web-searchable map. Students gained valuable skills as they applied knowledge taught in the classroom to a community-based project with real and lasting results. This chapter provides an overview of the Warren County Blueways project, highlighting its development, goals, achievements, benefits, community partners and future plans.

Introduction

Western Kentucky University's (WKU) Outdoor Leadership Program has taken the idea of helping students become better community members (espoused by the American Democracy Project) and adapted it to meet the needs of WKU students and the citizens of Bowling Green and Warren County, Kentucky. Through the creation of the

A Western Kentucky University student constructs signage for the Warren County Blueways.

Warren County Blueways project, students in the Outdoor Leadership minor learned firsthand how to adapt and improvise through myriad obstacles while helping develop a unique community outdoor recreation resource, a water trail system. Moreover, as part of the project, students learned how to become better stewards of the natural environment by learning about issues related to water quality; recreational access on private lands; the role of local and state government involvement in creating an interconnected park and trail system; and the importance of developing networks and partnerships with government agencies, nonprofit organizations and private businesses to provide recreational services and areas to community members.

Inspired by the concept of addressing local public land stewardship that was investigated during the American Democracy Project's Yellowstone seminar, one of the professors in the Recreation Administration program came up with a plan to involve WKU students in a project that would help the local community to re-embrace prominent features of the local landscape. Specifically, the Warren County Blueways project is an effort to bring the rivers and creeks "back to the community." Through this program, recreational use of the local waterways reintegrates the rivers into the lives of community members and allows the navigable waterways in the county to be part of a recognized Greenways park and trail system. In the following pages, this chapter highlights the development, goals, achievements, benefits, community partners and future plans of the Warren County Blueways project.

Community-River Relationships

Traditionally, many towns and cities across the United States were established along rivers and streams, the original natural highways. These waterways were integral to the success of the community for drinking, transportation, sewage and refuse disposal. As the country grew larger and became more mobile and reliant on train and eventually automobile transportation, rivers often faded into the background as a neglected part of the landscape. In many cases, they became open sewers for chemicals and human waste as more and more cities needed outlets for refuse disposal. The old axiom, "the solution to

pollution is dilution," was accepted and the unfortunate diluting agents were the waterways. In many rural areas, the river valleys also became unofficial local landfills. People ignorantly believed that if they threw their trash into the waterways it would simply "go away." Fortunately, as the populace has become more educated, people have slowly begun to realize that their "away" is someone else's front yard or drinking water supply and that "we all live downstream." With this realization, old practices of dumping everything into waterways are changing. Today, more than at any point in U.S. history, best management practices are being applied to rivers. However, there is still evidence of poor water and river conservation practices.

The Blueways Movement

Blueways are similar to hiking trails, but they follow existing rivers and streams and may have markers to guide paddlers or motorboat drivers along the "path." Ideal blueways trails have beautiful scenery and abundant wildlife, as well as easy canoe and kayak access (see Lake County, 2009). The blueways movement has been gathering momentum as more and more towns and cities develop linear parks to link together existing parks and natural areas. These linear parks, also known as "greenways" or "greenbelts," often follow the most natural route which includes existing river riparian zones, the area on either side of waterways, often in the flood plain. Riparian zones are usually unsuitable for buildings but provide a natural corridor for wildlife. Riverside vegetation serves as a filter for stream water quality, moderates water temperature and helps prevent or reduce soil erosion.

The American Canoe Association's (ACA) Water Trails program provided a framework for developing the Warren County Blueways trail system in accordance with national program expectations (see the American Canoe Association, 2009). The Blueways project now has a Web site that includes a map of all 180 miles of local navigable creeks and rivers, designated access points, photographs, and GPS coordinates for all access points. Each water trail segment is described by the distance of the segment, the difficulty of the paddling, and specific information about the access points (see wku.edu/blueways). There are also photographs and GPS coordinates for interesting

features, such as caves and springs along the route. The Web site offers a downloadable brochure that includes conservation and "Leave No Trace" educational materials to encourage appropriate low-impact behaviors for water trails users. This information is also linked on the Greenways Commission of Bowling Green and Warren County Web site (see warrenpc.org/greenways/).

Warren County Blueways: Student Engagement with Tangible Results

The Warren County Blueways is a unique project with multifaceted objectives. The most important goal was to "bring the rivers back to the communities" through greater awareness and stewardship programs. This project incorporated several other objectives beyond the basic establishment of a water trail system. Technological targets included a state-of-the-art GIS Web-based mapping information system displaying the network access points in the over 180 miles of rivers in Warren County and small segments in the surrounding six counties. The Blueways' Web site (wku.edu/blueways) contains pictures of access and river attributes throughout all of the featured rivers and streams. Additionally, the Web site provides a printable brochure that shows a map with entrance points, roads, river distances between access points and a verbal description of the access points. Both the Web site and brochure were developed as "living" documents that could be easily adapted with the evolution of the Blueways project (Warren County Blueways, 2009).

The civic engagement goal of this endeavor was the active participation of students in completing a practical, valued project at the local level. The result was applied action by students and should serve as a model for other communities. Moreover, students were essential to the development and maintenance of the water trail system throughout Bowling Green/Warren County and the surrounding region. From the outset, students from the WKU Outdoor Leadership Program (OLP)—which is part of the Department of Kinesiology, Recreation and Sport—have been involved with this project at multiple levels. Throughout the process, these students have had interactions with various types of agencies, including government,

nonprofit and private businesses. They collected GPS and photographic documentation of numerous water trail segments along the rivers and creeks in Warren and surrounding counties. Their input on the design of the logo, brochure, Web site, educational materials and signage for the water access points was invaluable. They actually constructed and placed the signs at all of the current access points. In addition, the students continue to monitor the signs for damage and vandalism and replace or repair as necessary.

Project Development

This project materialized over a number of years and was spearheaded through the Western Kentucky University Outdoor Leadership Program. The initial step was to contact boaters with knowledge of the region and river access points. That knowledge was compared with information from Sehlinger and Malloy's "A Canoeing & Kayaking Guide of Kentucky" (2004), which helped us create a first draft map with known entrance points. After learning about the ACA-Recommended Water Trail program (American Canoe Association, 2009), faculty members pitched the idea to the Greenways Commission of Bowling Green and Warren County, which listed river access as a priority for the community. They also discussed plans with Warren County Parks and Recreation and Bowling Green Parks and Recreation. Moreover, the Warren County Fiscal Court and the City of Bowling Green provided funds for structural improvements at access points. OLP faculty and students also met with private landowners (whose land lies adjacent to access points) to get permission to park on their property and carry their boats to the access points.

Next, faculty members began searching for ways to fund this project and wrote several grant proposals. The WKU Provost Office awards internal grants called the Provost's Initiatives for Excellence (PIE) for activities that include significant student engagement. The Blueways program received money from this fund to use as seed money to begin developing the project. In order to improve the chances of receiving additional grant monies, more project support partners were added, such as the Kentucky Department of Fish and Wildlife Resources and the Kentucky Division of Water. The

Recreation Trails Foundation awarded a grant to develop access points and further develop the Blueways program. The We Make Things Happen Corporation (WMTH), a company that develops Web sites, graphics and tourism brochures, provided an in-kind donation to develop the Blueways logo, Web banner, printable map and brochure.

Because project organizers wanted GPS coordinates and GIS data on the Web site, the WKU Center for Geographical Information Systems helped develop the protocol for GIS and photographic data. Students in the GIS certificate program trained students from the Outdoor Leadership Program on how to use the GPS units and what information to record at each point of interest. OLP students then gathered GIS data and took pictures of river access points and stream features along each mile of the waterways and at points of unusual significance.

The WKU Center for Geographical Information Systems developed the Web site template and uploaded the GIS maps with assorted layers and search mechanisms. The Center then uploaded the photographs and GPS data collected by the OLP students to the GIS system and the Web site. Once the initial data was uploaded, faculty members refined, updated and corrected incorrect information and pictures. Students then took additional pictures and GPS waypoints in certain areas. OLP students and faculty provided feedback on the usability of the Web site and its features, which led to several additions and changes.

Eventually, OLP students and faculty designed, created and placed signage at all access points. As stated before, they also continued monitoring signage locations for changes, vandalism or needed maintenance. In order to improve visibility, a few signs ended up being moved from the water or road.
The WMTH Corporation provided assistance with public relations and promotion efforts. Faculty and students continued working with the Greenways Commission of Bowling Green and Warren County, Warren County Parks and Recreation, and Bowling Green Parks and Recreation in Blueways coordination. Faculty and students continue to investigate new access points and request access from private landowners.

Project Benefits

Although the Warren County Blueways project is still in its infancy, multiple benefits have already been identified. First, WKU Outdoor Leadership students provided a valuable public service and learned more about local government agencies and local businesses. They applied knowledge learned in the classroom to make a real and positive influence in the community. In fact, the Warren County Judge Executive issued OLP students a citation for their efforts in improving the quality of life of the citizens of Warren County and creating a mechanism for increased tourism in the area.

Second, the community itself has also seen many benefits from this project. With the development of additional recreation areas, the quality of life in Warren County has improved. In addition, more people are taking advantage of paddling and other river recreation opportunities because of better river access. There is now an increase in instruction in canoeing, kayaking and river rescue and, in fact, 42 people have been trained as American Canoe Association Instructors in Bowling Green during the past four years. In the summer of 2008, as community members gained interest in rivers and creeks, a new paddling club was created; as of July 2009, there are almost 200 club members. The number of retailers selling canoes and kayaks in Bowling Green/Warren County has increased from one to three over the last four years. The Warren County Parks and Recreation Department has given out 74 permits to citizens wishing to access rivers outside of normal operating hours. In addition to paddle sport enthusiasts, motorized boat drivers—including jet skis, speed boats and fishing boats—now have additional information to help them distinguish which areas are suitable and safe for motor-boating, skiing and wakeboarding. Local anglers also have better access to fishing areas from the banks of the rivers and creeks.

Third, as the citizens of this area become more aware of the natural resources, they understand the need for conservation of water resources and riparian areas. Along with educating members of the community about the local rivers and creeks, part of the Warren County Blueways project is to teach the seven Leave No Trace (LNT) Principles. LNT's mission is to encourage minimal impact to the natural ecosystem when people enjoy outdoor pursuits (see lnt.org).

Fourth, there are also economic benefits associated with having a water trail in the community. As marketing and promotion has increased, more boaters have visited the community for canoeing and kayaking. While in town, they buy food, gasoline and other supplies. Some paddlers even spend the night in local hotels or campgrounds. Although there has not yet been an official economic impact study on the Warren County Blueways, similar studies in North Carolina and New York have shown that local paddling groups spend about $215 per day and groups from the outside of the community bring in over $400 per day (Pollack, 2007).

Finally, by far the most important benefit of bringing the rivers back to the people of the region is constantly improving the health of the community. More access to the blueways allows for expanded opportunities for physical activity and stress relief.

Conclusion

At Western Kentucky University, faculty members are encouraged to promote student engagement in community affairs. In the Warren County Blueways project, students have served and continue to serve a primary role. As the program evolves, students will have additional opportunities for more civic engagement. Students and faculty in the WKU Outdoor Leadership Program will continue to work with the partners in the Warren County Blueways project to maintain signage and access points. They will also cooperate with private landowners to add new access points. Students will continue to collect pictures of access points and river features. As the project grows, they will also seek out new grants to support the program.

The Blueways project has several objectives that it hopes to achieve in the future. One of the ultimate goals is to be recognized as an ACA-Recommended Water Trail. Each summer, the American Canoe Association selects 12 water trails from the U.S. and Canada as ACA-Recommended Water Trails. ACA-Recommended Water Trails meet a set of basic criteria and stand out as particularly good destinations for paddlers. These trails earn the right to use a special ACA logo in maps, signs and other printed material

related to the trail. They also receive special recognition in the ACA Water Trail database on their Web site. Another objective of the Blueways project is promoting an increase in instruction for all forms of watercraft and river recreation activities. Finally, supporters of the Warren County Blueways will continue to promote the development of a whitewater park on the Barren River at Mitch McConnell Park in downtown Bowling Green. All of these objectives, of course, will focus on students and will seek to help them develop a better understanding of responsible citizenship and the stewardship of public lands.

References

American Canoe Association. *The ACA's water trails database.* Retrieved from americancanoe.org/site/c.lvIZIkNZJuE/b.4343521/k.939D/ACA_Water_Trails.htm

Bowling Green Canoe and Kayak. Retrieved from paddling.meetup.com/51

Greenways Commission of Bowling Green and Warren County. Retrieved from warrenpc.org/greenways

Lake County. *Lake County's blueways: Waterway trails offer canoeists and kayakers more than 130 miles of paddling bliss.* Retrieved from lakecountyfl.gov/boating/blueways.aspx

"Leave No Trace." Available at lnt.org.

Pollack, N. (2007). *Economic impact assessment of paddler recreation in the Adirondacks.* University of Vermont Tourism Data Center.

Sehlinger, B., & Molloy, J. (2004). *Canoeing & kayaking guide to the streams of Kentucky* (5th ed.). Birmingham, AL: Menasha Ridge Press.

Trails-r-us. *Whitewater in Kentucky: Bowling Green Whitewater Initiative.* Retrieved from trailsrus.com/whitewater/initiative.html

Warren County Blueways. Available at wku.edu/blueways.

Western Kentucky University. *Schedule of classes* [Data file]. Retrieved from acsapps.wku.edu/pls/prod/wku_hwsched.P_CrseSearch

Democratic Limits of Political Conflict

Thomas Holyoke

Abstract—Every year hundreds of interest groups negotiate compromises on dozens of political issues important to the public. Does such compromise serve the public interest, or just the factions of the public these organizations represent? Although interest groups cannot be forced to only consider the public interest when they negotiate and bargain over legislation, in this paper I suggest a way in which we can evaluate political compromises to see whether they are acceptable to at least a majority of the public. This straightforward solution offers university students a chance to not only sharpen their civic skills, but also to better understand issues important to the public. Using the contentious issue of California's San Joaquin River restoration as case study, I show how a solution may be approached.

In *Democracy in America,* Alexis de Tocqueville praised Americans of 1831 for their willingness to solve problems collectively, in groups bound together by common concerns and values, rather than by appealing to the state. Today Americans continue to demonstrate a propensity for group formation, only now the thousands of interest groups populating the political landscape prefer using the state to advance their economic and social goals (Walker, 1983). This congestion makes group politics competitive, citizens in one group perceiving another's success as coming at their own expense. Yet the Politics and the Yellowstone Ecosystem case, as well as work by McFarland (1993) on environmental cooperation, McCool (2002) on Native American water rights, and Brower et al. (2001) on the Colorado River, demonstrate that competition does not have to result in endless conflict. Compromise is possible.

The problem for policymakers is not so much how to convince competing groups that they have a common interest in compromise, but how to ensure that *public* policies enacting these compromises are actually in the public interest. Group advocates, after all, are only obliged to push the desires of their own members. Unfortunately, how to determine whether

group compromises really are in the public interest is not entirely clear (Steelman & DuMond, 2009). Here I lay out a definition of the public interest grounded in political science theory and research that can be used to evaluate settlements proposed by competing groups. I then explore the case of political compromise over restoration of California's San Joaquin River to suggest how this evaluation might be implemented by students. Hopefully, this not only helps "manage" group conflict, but also provides a way to engage students politically and provide academia a role in political dispute resolution.

Interest Groups and the Public Interest

The theoretical task is to pin-point the "locations" of possible interest group policy compromises in a way that permits us to evaluate them by some measure of the public interest. I begin by conceptually dividing individuals who perceive themselves as having a stake in how an issue is resolved by policy into two types of publics.

Competitive Interests and Political Compromise

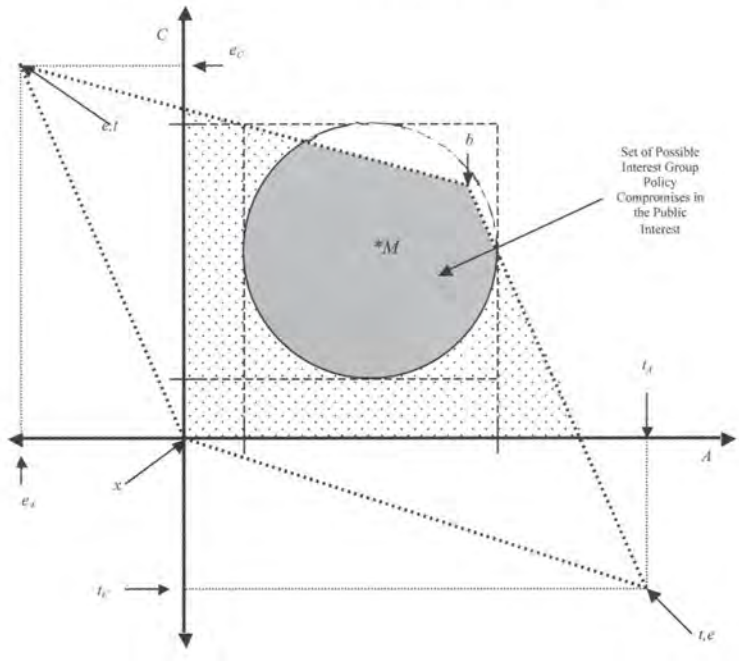
The first public is comprised of those individuals who are members of interest groups: highly motivated citizens with common economic and social interests mobilized to pressure policymakers into enacting laws defending their interests from other, similarly mobilized citizens. Just how they compete and negotiate is complex, but we can easily create a conceptual diagram of the results by utilizing the bargaining theory of Nash (1950) as applied to interest groups by Holyoke (2009). Using the contentious issue of snowmobile access to Yellowstone National Park should help make this intuitive, especially as it reflects the competing values often underlying environmental conservation issues (Dustin &

As part of an internship with the National Park Service's Mediterranean Research Learning Center, ESRM student uses plastic quadrats to monitor marine life in the rocky intertidal zone along Southern California's Pacific Coast.

Schneider, 2005) and the institutions charged with public lands management (Nie, 2008).

This case has two sets of interest groups. The first represents the tourism industry in the towns surrounding the park that benefit from extensive snowmobile access (see Yochim, 2006). Horizontal line A in Figure 1 denotes a continuum of possible policies allowing varying levels of park access, with higher levels to the right. Presumably tourism groups want very high levels of access, so their "ideal position" might be at point tA. The competing groups are environmental interests desiring to preserve wildlife habitats and air quality. Their ideal position, eC, is high on vertical line C and, because conservation requires severe restrictions on snowmobile access, far left on line A at eA. Point e,t is the benefit to both sides if the environmentalists get everything they want in a policy and tourism getting nothing, and vice versa for point t,e. Point x is the likely outcome for both if they refuse to compromise, the possibility that all they gain for enormous expenditures of resources is no policy at all or a judge mandating little access and less

Figure 1: Interest Group Compromise Within the Public Interest



conservation. A compromise must therefore be a policy trade-off that is jointly better than x, or higher and to the right of x, but still not giving either side everything they want (lower than eC and left of tA). Many such positions exist in Figure 1 in the spotted area, with b the best bargain for both groups and the one both should logically support (see Axelrod, 1970).

If interest group competition is all lawmakers ought to care about, then they should enact compromise b. However, this is not the case. Democracy resting on a nearly universal franchise must not give a priori advantage to group interests over un-mobilized citizens concerned with the same issue just because the latter are unorganized. Instead, whatever compromise is struck by competing interests should also be in the public interest in that it must be acceptable to a majority of citizens concerned with the issue. The trick for lawmakers is to find the edges of this set of publicly acceptable policies, what might be called "democratic break-points."

Issue Publics and Democratic Break-Points

Lawmakers, undoubtedly, have hundreds of issues on their agendas, but each issue tends to be important to only a handful of individual citizens; the entire electorate is thus carved up into a large number of "issue publics" (Converse, 1964). Furthermore, individuals within these issue publics vary significantly in how strongly they feel about each issue (Krosnick, 1990). Those who feel most passionately about it, and how it is resolved with policy, tend to recognize only one dimension of potential policy outcomes and prefer fairly extreme positions on it—such as maximum habitat protection or absolute snowmobile access (Jelen & Wilcox, 2003). They are also more likely to be members of interest groups because these organizations provide opportunities to pursue their passion for the issue (Berry, 1999). Citizens with less intense feelings are often more willing to recognize the validity of both dimensions (habitat preservation and limited access) and the need for trade-offs between them (DeHaven-Smith, 1985), and are less likely to join interest groups. The majority of citizens in an issue public tend to fall into this second category, and it is they who form the second type of "public."

The "public interest" is therefore determined by what policy trade-offs are acceptable to this larger, moderate, and non-group affiliated public. In the snowmobile example, they might be citizens who enjoy visiting the park

but are not in a tourism or conservation group. If a majority of them prefer moderate levels of habitat preservation and snowmobile access, then more of them favor positions in the center of dimensions A and C and would vote for a policy at point M (M for majority, the gold standard in a democracy) if given the opportunity. A moderate issue public might also support policies relatively close to M, but other policy outcomes may be perceived as too ideologically extreme.

In Figure 1 boundaries are set on both A and C beyond which a policy would authorize too much or too little conservation and/or snowmobile access to gain majority support. Although dashed lines from these boundaries form a box around M, only a circle can represent a set of proposals a public would support without being biased towards (or against) one side or the other; a proposal on the edge of one side of the circle is just as far away from M as one on the other side. The circle must also be entirely inside the box because if it goes over it would include positions unacceptable to the majority. Thus, the circle in Figure 1 contains all possible policies acceptable to the issue public, with those on the edge marking the boundary between acceptable and unacceptable—the democratic break-points. If lawmakers want to create policy in the public interest, then they must only enact compromises *within this circle of public interest.* Policies acceptable to both interest groups and the issue public are in the circle's shaded portion.

Can the abstractions of Figure 1 be made concrete in the context of the Yellowstone snowmobile issue? Because the public interest is defined by majority supported trade-offs between conservation and access, the best approach is to identify who are regular Yellowstone visitors and use surveys to present them with a series of possible trade-offs. The advantage of surveys is that they provide opportunities to ask nuanced questions capable of capturing such trade-offs (see Lacy, 2001). Just as questions yielding responses highly supportive of restricting abortion generate very different answers when qualified by statements about the mother's health and in cases of rape (Jelen & Wilcox, 2003), so too can questions be structured to ask respondents about varying degrees of snowmobile access for set levels of habitat preservation and vice versa. The boundaries between acceptable and unacceptable constitute democratic break-points.

Restoring the San Joaquin River

Teaching university undergraduates how to identify the public interest requires an issue contentious enough that at least two interest groups are fighting over it, not only pushing different policies addressing the issue, but articulating significantly different interpretations of what the issue is really about. At the same time it should not be so complex that students cannot understand it, or so intractable that interest groups have not been able to find any common ground for policy compromises (like abortion). Environmental issues fit these criteria. As Young (2007) argues, the purpose of environmental policy has become deeply contested, with some portions of the public possessing beliefs regarding the ownership of, and right to use, public lands and natural resources that are fundamentally at odds with the beliefs of others. Cherney and Clark (2009) even note how difficult it is to determine what the public interest really is on such issues (also see Nie, 2008). Finally, the issue should be important to the university's community, giving it an opportunity to provide a public service and making it more likely that students will start class with some understanding of the issue. At California State University, Fresno, an issue fitting this description might be the future of the San Joaquin River.

The San Joaquin River originates high in the eastern Sierra Nevada Mountains and then links up with the Stanislaus, Merced and Sacramento rivers before spilling into the Pacific Ocean in San Francisco Bay...or at least it did before the creation of the Central Valley Project. In the early 1940s, the U.S. Bureau of Reclamation began developing a large and complex water diversion system to support a growing agriculture industry in California's Central Valley. In order to provide irrigation water, as well as additional water to supplement the groundwater used by urban residents, the bureau dammed the upper waters of the San Joaquin River before its confluence with the Merced and Stanislaus. Millerton Lake was formed by Friant Dam with two large canals diverting substantial amounts of water to contracting agriculture utilities in the Friant Division Service Area (Congressional Research Service, 2007).

The San Joaquin River also historically supported large populations of Chinook Salmon, significant numbers of which (perhaps over 200,000 annually) would migrate up the river as far as Mammouth Lake—50 miles above Friant Dam, deep in the Sierras—to spawn (Myers et al., 1998). Yet the bureau's diversion of the river was so complete that approximately 60 miles of river bed below Friant Dam is dry most of the year, making salmon migration (and thus survival) impossible. In 1988 a number of environmental conservation interest groups made common cause with angler groups and sued the bureau to force it to release water from Friant Dam to restore the salmon. Finding that the bureau was violating the Endangered Species Act, the Environmental Protection Act and state wildlife habitat conservation laws (which the bureau must comply with), a U.S. District judge in Natural Resources Defense Council v. Rodgers ordered the bureau to release enough water from Millerton Lake to restore the salmon.

This issue is good for helping students learn how to find interest group compromises that also serve the public interest because efforts at compromise have already been made. With the judge wanting to schedule hearings on just how much water to release through Friant Dam, agriculture interests, afraid of how much water might be taken from them, approached the conservation groups to negotiate a settlement. Fearing that most, or even all, of their gains might be reversed if there was further litigation, conservation interests agreed to negotiate. In other words, three of the four outcome points portrayed in Figure 1 can be identified: point e,t where agriculture interests lose enormous amounts of water regardless of how dry the planting year but the river is fully restored, and point t,e retaining the old status quo of no water diversion at all for river and fish restoration. Point x is the risk of continuing to fight through the courts where both sides are only guaranteed substantial legal costs.

The task for students is to determine the location of the democratic break-points forming the circle of public interest portrayed in Figure 1. A settlement currently exists (point b) in the Omnibus Public Lands Management Act of 2009, requiring the federal government to compensate agricultural interests for the loss of water and build new water conveyance systems, but also setting limits on how much water can be diverted from fish restoration (none at all in the very driest years). It is a controversial

settlement. By some estimates agricultural water users might see an annual loss of up to 15-16 percent of their water, and possibly a loss as high as 34 percent in severely dry years (Steiner, 2005; U.S. Bureau of Reclamation, 2006). In addition, there will be financial and job losses to local agriculture ranging from $40-$180 million and 1,200 to 17,900 jobs (Congressional Research Service 2007, p. 15-16). Yet most of the competing interests have agreed to it.

Determining whether this compromise is within the circle of public interest requires several steps. First, students must determine who the "public" is in this case, most likely citizens in the upper San Joaquin Valley likely to be impacted, positively or negatively, by the proposed settlement. Students should start by conducting field interviews with interest group representatives, learning not only the arguments and concerns of these organizations and whom they represent, but also more about the complexities of the issue. Under the guidance of their professor they should collect information independently from media sources and internet searches prior to these meetings so that proper questions can be asked and interest group leaders will not feel that their time has been wasted. In this case students would speak with area representatives of conservation and sporting groups, as well as agriculture interests representing the 28 irrigation districts comprising the Friant Division. Local officials at the Reclamation Bureau and the California Department of Water Resources should also be interviewed.

Armed with information, students, under the guidance of their professor, would design surveys to administer to a geographically defined population they identify through their initial fieldwork, most likely residents of California's Fresno and Madera Counties in this case. Like many universities, California State University, Fresno, has a survey research center capable of administering surveys in a timely manner (provided that funding is available). Two sets of questions should be asked. The first is a battery of questions aimed at determining whether the respondent is truly impacted by the proposed river settlement, as well as whether they see themselves as impacted. Those who meet both criteria can be considered as part of the relevant issue public. The second set of questions, to be administered only to the issue public, are trade-off questions modeled after the example in the previous section. Many questions would have to be asked, but some examples are:

Are respondents willing to support the restoration of the salmon population for fishing if this means reducing water to agriculture by an annual average of 15-16 percent? Are respondents willing to risk the unlikely possibility of over 5,000 full and part-time agriculture jobs being lost in a dry year for the guarantee of recreational opportunities on a restored river? Responses can be used to determine whether policy solutions, such as the river settlement, are indeed in the public interest. Finally, students and their professor would write a concise report to the stakeholders and political decision makers presenting their research.

It is worth pointing out that this is more than just an effort to improve student learning. Students and their professors are more likely than the involved interest group stakeholders to have an impartial view of the circumstances surrounding the issue. Students can help reveal the real limits of public interest, whereas organized interests may attempt to sway public interest, perhaps even deliberately misrepresent it to further their own political agendas. Thus, independent research by students can also serve as a check on interest group advocacy.

Final Thoughts

McCombs and Zhu (1995) not only find that the number of issues important to American citizens—and therefore important to government—is growing, but so to are the number of potential policy solutions to each issue, making them "volatile" in that they are prone to interest group competition. Popkin (1991, p. 36) also notes a distinct lack of "depth" regarding the public's understanding of issues, a failure of most citizens to be well educated regarding the real social problems embedded in issues, the possible trade-off solutions available and the consequences of not making such trade-offs. This would help students improve their civic education.

This task will not be easy for students, their professors or their universities. It would probably require at least two back-to-back semesters for a relatively small group of students to learn enough about an issue to conduct the fieldwork, design and implement the survey, and write a report. Perhaps two

or three courses connected in what are sometimes referred to as "learning communities" (multiple courses involving the same students connected by a pedagogical theme) might be the right academic framework. The extra effort this project would require of the managing professor might cause some to shy away from it unless universities agree to release them from other teaching or administrative responsibilities. Universities thus must be willing to provide some degree of financial support for the field work and surveys unless external funding from public sources, or private sources not connected to one of the involved interest groups, can be found. Finally, universities must also realize that the results of such a report might alienate existing or potential university funders. Yet universities, especially taxpayer-funded public universities, are increasingly being expected to provide direct public services to their communities, and it should be recognized that involving students in research and public decision making in this way benefits the community as much as it helps in the education and training of students to be critical thinkers and prepared citizens.

References

Axelrod, R. (1970). *Conflict of interest.* Chicago, IL: Markham Publishers.

Berry, J.M. (1999). *The new liberalism: The rise of public interest groups.* Washington, DC: Brookings Institution Press.

Brower, A., Reedy, C., & Yelin-Kefer, J. (2009). Conesus versus conservation in the upper Colorado River Basin. *Conservation Biology,* 15 (August), 1001-1007.

Cherney, D.N. & Clark, S.G. (2009). The American West's longest large mammal migration: Clarifying and securing common interest. *Policy Sciences,* 42 (May), 95-111.

Congressional Research Service. (2007). *San Joaquin River restoration settlement* (CRS Report for Congress No. RL34237). Washington, DC.

Converse, P.E. (1964). The nature of belief systems in mass publics. *Ideology and Discontent.* New York: The Free Press, 206-261.

DeHaven-Smith, L. (1985). Ideology and the tax-revolt: Florida's Amendment 1. *Public Opinion Quarterly,* 49 (Autumn), 300-309.

Dustin, D.L., & Schneider, I.E. (2005). The science of politics/The politics of science. Environmental Management, 34(6), 761-767.

Holyoke, T.T. (2009). Interest group competition and coalition formation. American Journal of Political Science, 53 (April), 360-375.

Jelen, T.G. & Wilcox, C. (2003). Causes and consequences of public attitudes toward abortion. Political Research Quarterly, 56 (December), 489-500.

Krosnick, J.A. (1990). Government policy and citizen passion: A study of issue publics in contemporary America. Political Behavior, 12 (March), 59-92.

Lacy, D. (2001). A theory of nonseparable preference in survey responses. American Journal of Political Science, 45 (April), 239-258.

McComb, M., & Zhu, J. (1995). Capacity, diversity and volatility of the public agenda. Public Opinion Quarterly, 59 (Winter), 495-525.
McCool, D. (2002). Native Waters. Tucson, AZ: University of Arizona Press.
McFarland, A.S. (1993). Cooperative Pluralism. Lawrence, KS: Kansas University Press.
Myers, J.M., et al. (2007). Status review of Chinook salmon from Washington, Idaho, and California (National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Technical Memorandum No. NMFS-NWFSC-35). Washington, DC.
Nash, J.F. (1950). The Bargaining Problem. Econometrica, 18 (April), 155-162.
Nie, M. (2008). Governance of Western Public Lands. Lawrence, KS: University of Kansas Press.
Popkin, S. (1991). The Reasoning Voter. Chicago, IL: University of Chicago Press.
Steelman, T.A. & DuMond, M.E. (2009). Serving the common interest in U.S. forest policy. Environmental Management, 43 (April), 396-410.
Friant Water Users Authority. (2005). Effects to water supply and friant operations from plaintiffs' friant release requirements. Fresno, CA: Steiner, D.B.
U.S. Bureau of Reclamation. (2006). Friant division allocations based on SJR-settlement Exhibit B hydrographs for restoration tables. (U.S. Department of the Interior). Washington, DC.
Walker, J.L. Jr. (1983). The origins and maintenance of interest groups in America. American Political Science Review, 77 (June), 390-406.
Yochim, M.J. (2006). Victims or victors: Yellowstone and the snowmobile capital of the world. Historical Geography, 34(2), 158-183.
Young, O.R. (2007). Rights, rules, and common pools: Solving public problems arising in human/environment relations. Natural Resources Journal, 47 (Winter), 1-16.

Public Lands in the Elementary Curriculum

S. Kay Gandy

Abstract—The public lands of the United States cover more than 600 million acres and can offer an intriguing addition to the elementary curriculum and teacher candidate training. Developed by a participant in a great trek across America's public lands, this article shares lesson ideas and resources available for teachers.

Introduction

The public lands of the United States cover more than 600 million acres and include national parks, national seashores, national wildlife refuges, wilderness areas, national forests, monuments, select lakes and seashores, underground mineral reserves, marine sanctuaries, historic and scenic trails and national grasslands. Most of the nation's public lands are concentrated in the western states, but all 50 states have at least one area designated as public lands. These lands provide natural resources, protect ecosystems, and offer places for outdoor recreation and education, not only at the university level but also at the elementary level. Public lands offer an intriguing way to teach and are an alternative to the indoor classroom. The purpose of this paper is to introduce lesson ideas and Web sites related to public lands that are applicable to elementary classrooms and teacher candidate training.

Yellowstone River.

My university has participated in AASCU's American Democracy Project (ADP) for several years. I was fortunate to be chosen to attend an ADP session at Yellowstone National Park in 2007 related to civic engagement with public lands. From its remarkable beginning,

Yellowstone National Park set aside some two million acres for preservation and public enjoyment and led the nation in establishing national preservation for all people (Mackintosh, 1985, p. 12). The Yellowstone Ecosystem was used as a case study to encourage college and university personnel to educate and involve students in political disputes about public lands, environmental issues and use of resources. During the stay at the park, I participated in forums on snowmobile use, the fencing of bison and the wolf restoration program. This experience led to inclusion of public land issues in the teacher education courses that I teach.

Since all citizens share the responsibility of seeing that public lands are cared for and managed well, land issue topics should be introduced and debated in the classroom, both at the university and the elementary levels. The National Geographic Society's *Xpeditions* Web site published a lesson to encourage students to debate; consider the best use for public land in their state; and create a proposal to persuade legislators about the best use for a hypothetical piece of public property ("Public Land: Preserve or Develop?"). Students are introduced to the various ways that public lands are valued, used and managed in the United States. Students then compare and contrast different types of public lands, and simulate the decision-making and communication involved in converting private land to public land (taking into consideration the location, terrain and climate of the land, as well as the needs and desires of the region's residents).

The attendance at the Yellowstone Project complimented a much more intensive program that I participated in through the sponsorship of public land agencies and the National Geographic Society in 2002. I became interested in public lands when I was chosen to participate in a trek across America's public lands, a journey three years in the making. Two teams of 12 members, including four teachers chosen by the National Geographic Society, participated in *American Frontiers: A Public Lands Journey.* Each team crossed 1,600 miles of public land in a journey that lasted 60 days. This campaign was designed to educate Americans about the history, value, relevancy and role of public lands. The journey had never been accomplished before and highlighted the accessibility and benefits of public lands. School visits were planned along the trek to inform students about America's national heritage and to encourage students to follow the online journals and

maps of the trekkers. The teachers on the trek were required to develop lesson plans relating to public lands from the experience. After the journey ended, lesson plans were posted on the American Frontiers Web site (American Frontiers Lessons) and became a part of *Geography Action! 2002: America's Backyard* (Geography Action: Public Lands), a public awareness campaign of the National Geographic Society. Other educational elements developed in conjunction with the trek included Web-based resources and activities, a public lands poster and an online museum (Public Lands Museum).
The trek across America's public lands not only involved outdoor travel, but also meetings with public land advocates for information gathering at special events and roundtable discussions. Some of the forums included a program on historic mining; a wilderness roundtable discussion concerning the difficulties faced in managing wild areas; the wolf-reintroduction and the condor reintroduction programs; and fire restoration processes. The message we received was loud and clear. There are many advocates, land managers and concerned citizens who treasure our public lands. There are also many difficulties they face. As populations increase, these managers confront pressure to meet recreation and natural resource needs. Land issues—including use, economics, changes, anti-government sentiments, fees and local control—are controversial topics for forum discussions in both community and school settings.

Taking the Students Outdoors

Both of these public land experiences greatly impacted my teaching strategies and content, first in the elementary curriculum with the trek and secondly in teacher training with the Yellowstone event. As I work with teacher candidates or elementary classroom teachers, I share that since every state has public lands, teachers can take advantage of the opportunity to use the land as an outdoor classroom or include public lands as part of the curriculum. Diverse ecosystems provide opportunities for students to interact with the natural world and have meaningful lessons without a textbook. The possibilities are endless: following historical routes of explorers, judging the use of resources, examining the land (geography, geology, flora, fauna, climate) or experiencing the culture of a Native American tribe. With the Land Ordinance of 1785, the United States Public Lands Survey established boundaries for land ownership. In order to make the distribution as equitable as possible, they decided to divide up the West with squares. Using public

lands would be a great introduction to teaching students about Township and Range.

Students can hike, kayak, canoe, ride horses or even camp in the great outdoors. While on the trek, I met a teacher in Arizona who took her sixth grade boys camping one weekend and her girls the next weekend. She explained that not only did her students learn to appreciate the land, but it gave her an opportunity to know her students in a different way. Many of the land management agencies have educational programs to encourage public lands as an outdoor classroom. For instance, the National Park Foundation created Parks as Classrooms®, a program to promote parks as learning laboratories and create awareness and commitment to preservation of the park environment. Students can interact with the natural world, view historic sites and artifacts and learn an appreciation for America's most precious resource (Yaunches, 2004, p. 1).

Another opportunity for teachers to get students outdoors and experience the relevance of public lands would be the celebration of National Public Lands Day (NPLD). NPLD is held yearly in late September. From its beginning in 1994 with 800 volunteers, to the nearly 90,000 volunteers today, NPLD strives to build partnerships for the stewardship of America's public lands. Volunteers build trails, plant trees, remove trash, improve habitats or protect resources in over 800 sites in all 50 states. For more information about how students can participate in this annual event, visit the Web site (publiclandsday.org/).

Lesson Plans from American Frontiers

An outdoor classroom leads to a natural integration of subjects across the curriculum: biology, earth science, history, geography, civics. What follows are summaries of several lessons posted on the American Frontiers Web site that were developed as a part of the trek across America's public lands. Additional lesson plans posted on the site relate to habitats and land use. The complete lessons can be obtained at the Web site (americanfrontiers.net/lessons/).

Postcards from the Edge: Endangered Species

The U.S. Fish and Wildlife Service is a bureau within the Department of the Interior whose mission is to work with others to conserve and protect fish, wildlife and plants, and their habitats. The bureau manages the 93 million-acre National Wildlife Refuge System with more than 530 individual refuges, wetlands and special management areas. Among its key functions is the protection of endangered species. The purpose of this lesson is to create an awareness of endangered species and have students analyze reasons to protect the species.

Have students identify endangered species in their state and create postcards of facts and pictures about the species. Since the arrival of Europeans in North America, more than 500 species have become extinct. In 1973, the U.S. Congress passed legislation that encouraged states to develop and maintain conservation programs (the Endangered Species Act). Postcards created by students should include a photo or drawing, status details, life history, habitat designation, and recovery plans of the endangered species. Postcards should then be displayed on a bulletin board or used to play a game.

The Superheroes of Public Land Management

Congress established a policy to retain public lands in public ownership, to identify and inventory their resources, and to provide for multiple and sustainable uses. The purpose of this lesson is to introduce students to public land management agencies and the challenges they face.

Have students collect information about a public land management agency and design a superhero to represent the agency. Superhero designs need to include the emblem for the agency and incorporate facts about the agency. Several departments of the U.S. government manage public lands. Students can choose from the Bureau of Land Management, the USDA Forest Service, the U.S. Fish and Wildlife Service, the National Park Service or the Bureau of Reclamation (see Appendix A). After designing superheroes, students will debate issues of land use and discuss challenges that land management agencies face.

The American Trail System

In the 1920s, citizens on both coasts began putting together the groundwork for the National Trail System. The National Trail System Act of 1968 designated the Appalachian and the Pacific Crest as the first two National Scenic Trails. Later, the National Historic Trails and the National Recreation Trails were designated. The purpose of this lesson is to create an awareness of the various trail systems, their location and the natural landforms associated with each system.

Have students research a trail system and create a display board with a map and advertising for the system. Students should answer the following questions: Which states does the trail cross? Does the trail journey north/south or east/west? Does the trail cross any private land? Who manages the trail? There are a variety of trail systems that students could choose to research (see Appendix B). Students can discuss controversies of land use with issues such as motorized vs. non-motorized forms of recreation.

Conclusion

The National Park Service will celebrate its centennial in 2016. In March of 1872, Yellowstone National Park was designated the first national park, but it wasn't until August 1916 that the National Park Service was created by an act signed by President Woodrow Wilson. National Parks are located in 391 areas covering more than 84 million acres.

Recently, new legislation was passed which will authorize federal money for states to educate students about environmental issues (the No Child Left Inside Act). In addition, the act provides funds to prepare teachers to teach about such issues. Instructors of teacher candidates need to include information on legislation that will affect future classroom instruction and provide resources that will aid in content and skill mastery. Utilizing the public land agencies' information, providing lesson ideas, and motivating students to participate in the stewardship of public lands are first steps toward meeting this goal.

We all share the ownership and responsibility of public lands. By introducing public lands through classroom lessons and outdoor experiences, teachers can help foster respect for the land and encourage responsible citizenship. These lands represent a priceless legacy that must be conserved for future generations. As our nation's urban areas expand, our quality of life will be challenged through the loss of open spaces. We must begin in elementary school to educate our children on the importance of preserving public lands.

References

Mackintosh, B. (1985). The national parks: Shaping the system. Washington, DC: Department of the Interior.

Yaunches, H.A. (Ed.). (2004). National parks as classrooms. Rural Roots, 5, 4-8.

Appendix A: Public Land Agencies

Bureau of Land Management. blm.gov

Agency of the Department of the Interior, which manages 264 acres of public lands, mostly in the western states.

Bureau of Reclamation. usbr.gov/

Agency of the Department of the Interior which manages, develops and protects water resources.

National Park Service. nps.gov/index.html

Agency that preserves the natural and cultural resources of the National Park System.

National Oceanic & Atmospheric Administration. channelislands.noaa.gov/

Agency of the Department of Commerce that manages marine sanctuaries to protect kelp forests, coral reefs and open ocean habitats.

U.S. Army Corps of Engineers. usace.army.mil/

Civilian and military men and women who work on environmental matters such as navigation, flood control, environmental protection and disaster response.

U.S. Fish and Wildlife Service. fws.gov/

Principal federal agency responsible for conserving, protecting and enhancing fish, wildlife and plants, and administering the Endangered Species Act.

USDA Forest Service. fs.fed.us/

Agency of the U.S. Department of Agriculture, which manages national forests and grasslands.

Appendix B: Trail Systems

Appalachian Trail. nps.gov/appa/

This trail is a more than 2,175-mile long footpath stretching through 14 eastern states from Maine to Georgia. It traverses the wild, scenic, wooded, pastoral and culturally significant lands of the Appalachian Mountains.

Arizona Trail System. aztrail.org

This is an 800 mile non-motorized trail that traverses the state from Mexico to Utah. The Arizona Trail is intended to be a primitive, long distance trail that highlights the state's topographic, biologic, historic and cultural diversity.

East Coast Greenway. greenway.org

By connecting existing and planned shared-use trails, a continuous, traffic-free route is being formed to create a 3,000 miles long pathway. The East Coast Greenway will be entirely on public right-of-way, incorporating waterfront esplanades, park paths, abandoned railroad corridors, canal towpaths and pathways along highway corridors.

Great Western Trail. gwt.org

This trail system traverses through 4,455 miles of five states and is designated for both motorized and non-motorized users. It encompasses the most diverse vegetation, topography and wildlife in the western United States, meandering through deserts, plateaus, canyons, forests and meadows.

Appendix C: Additional Web sites

American Frontiers
americanfrontiers.net.

American Frontiers Lesson Plans
americanfrontiers.net/lessons/.

Endangered Species Act. U.S. Fish and Wildlife Service
fws.gov/laws/lawsdigest/ESACT.html.

Geography Action! Public Lands. National Geographic Society
nationalgeographic.com/geography-action/lands.html.

National Geographic Society
nationalgeographic.com/.

National Public Lands Day
npld.com/.

No Child Left Inside
naaee.org/ee-advocacy.

Parks as Classrooms. National Park Service
nationalparks.org/about/mission/.

Public Lands Information Center
publiclands.org/home.php.

Public Lands Museum
publiclands.org/visitorcenter/.

Public Lands: Preserve or Develop? Xpeditions Lesson Plan. National Geographic Society
nationalgeographic.com/xpeditions/lessons/13/g68/preserveordevelop.html.

Think Global, Act Local: Lessons in Civic Environmentalism and Deliberative Democracy from the American Democracy Project's Stewardship of Public Lands Seminar

Pamela Stricker

Abstract—This chapter examines the development and implementation of a pedagogical technique aimed at providing students with a more meaningful classroom experience related to civic environmentalism and deliberative democracy. Drawing upon lessons from the American Democracy Project's Stewardship of Public Lands faculty seminar in Yellowstone, students not only study conflicts between various stakeholders in the Greater Yellowstone area, but they also learn firsthand about similar conflicts in their own backyard.

Introduction

In this chapter, I trace the evolution of a classroom pedagogical technique utilizing conflict-driven case study problem-solving to one based more on principles of civic engagement, conflict resolution and deliberative democracy (gained in part from the Stewardship of Public Lands seminar). This method provides students with a richer, more nuanced approach to the complexities of collaboratively managing our natural resources and public lands in an age of scarcity and palpable conflicts over uses like recreation, grazing and development. The skills obtained will serve students in a variety of real-world settings and likely enhance their ability to more fully participate in civic life.

Participants visit Mammoth Hot Springs.

During my 14 years of experience teaching, I have utilized case studies for more than a decade. A colleague, Vicki Golich, first introduced me to the method nearly a decade ago. I utilized this technique and expanded it a number of years ago to take on a role-playing aspect in international relations, public policy, and my environmental policy and politics courses (both U.S. and global foci.). But most of the cases followed a conflict model, that is, that the students assigned to simulate various "stakeholder" roles generally took on a conflict-oriented approach within the scenario I set forth for them. The technique worked quite well in facilitating learning about conflicts over issues, resources and the like. More often than not, students readily adopted the conflictual nature of the exercise and easily adapted their interactions to this mode. Students were very competitive in these simulations and often surprisingly aggressive. I began to have concerns that I was only teaching part of the lesson and needed to help my students move beyond conflict toward more meaningful problem solving.

A few years ago, I began reading literature on civic environmentalism and deliberative democracy in relation to a research project. I saw the necessary connection between fostering citizenship and environmental management. "Civic environmentalism is the process of custom designing answers to local environmental problems. It takes place when a critical mass of community leaders, local activists and businesspeople work with frontline staff of federal and state agencies and perhaps with others to address local issues they care about deeply" (Dewitt, 2004).

Civic environmentalism is a bottom-up process wherein citizens work with government officials to craft a "results-based sense of common-purpose in environmental governance" (DeWitt, 2004). In studying the latest trends in environmental management, one sees efforts to include interested stakeholders in the process of designing management plans, such as in the habitat conservation plans (HCPs) here in San Diego County. In essence, various interest groups and social movements gather around the table to express positions and needs and to iron out solutions, as in the HCPs, to balancing development and recreation with protection of endangered and threatened species and ecosystems. The important points for my students are the participatory dialogue process and collaborative problem solving approach. I realized I had to try to incorporate these types of skills into

my policy classes utilizing the role-play case simulations. In the past, I had generally devised conflict-driven scenarios for students. During the last portion of the simulation I would ask if they could come to an agreement. Generally, the more dominant personalities or the strongest nation or character would win out if they could get others to agree with their position. While clearly we do see the strongest parties "winning" in various settings, I realized that my students were only seeing one side of the situation: the strongest player wins. But if I were to teach the fundamentals of, for instance, how parties might come together to solve a problem, clearly I had to add some additional lessons. Further, if we hope to restore some of the civic participation that has been lost in our country in recent decades, then some of the civic skills necessary would have to be taught in class (see *Bowling Alone,* Putnam, 2000, and *Civic Engagement and American Democracy,* Skocpol & Fiorina, 1999). I still utilize the conflict-based case method as well, as that has real-world lessons for students, in addition to these new approaches.

Some students began to request more of a focus on problem solving in the case studies. Then, one of my former students with whom I remained in contact, mentioned that she had undergone graduate training in conflict-resolution. The factors came together and caused me to integrate notions of conflict-resolution and mediation skills into the final case study in a global environmental politics course on resource conflicts. That semester, I set up the course to include the traditional conflict-driven role-play case simulations in the first two cases; a conflict-resolution/mediation training workshop facilitated by my former student, Christina Simokat; and a case where students would try out their newly obtained conflict resolution/mediation skills. I wanted to teach students not only about the resource conflict issues in the syllabus and the conflict resolution/mediation skills, but also their importance by differentiating them from traditional conflict-driven modes. Many of the skills they learned and would later put to use in class involved listening and dialogue skills, as well as strategies for win-win negotiations. Students later told me they used these skills not only in their classes, but also in their work settings—civilian and military—and in interpersonal relations. This workshop and the class in general went well, but I still felt I was missing a piece in this puzzle.

That spring I was asked to represent California State University, San Marcos (CSUSM) at the summer 2006 ADP Yellowstone Seminar, an experience that was seminal for me. I finally understood how to really drive this new pedagogy home to my students. During the seminar, faculty participants conducted preliminary "field research" through meetings with various stakeholders representing the myriad points of view around issues such as wolf reintroduction, bisons and disease, and snowmobiling. Through these interviews, participants gained a much richer understanding of the complexities of the various interests. The experience was a living example of the concepts of civic environmentalism that my students were reading and I needed to figure out how to recreate that experience for them in the classroom setting.

As a result of the Yellowstone seminar, I designed a special course for spring 2007 that analyzed conflicts we encountered in the park, such as the reintroduction of the wolves, buffalo population control through permitted hunts, and snowmobiling. I titled the class, "Think Global, Act Local: Yellowstone, San Diego, Baja, and Civic Environmentalism." The class focused on Yellowstone as the iconic example of conflicts over resources and recreation, endangered species and recreation, ranching and endangered species, etc. Then I directed students to look in their own backyards for similar types of conflicts in San Diego County and along the U.S.-Mexico border. They conducted research and interviewed the various stakeholders and political players involved in their respective conflicts. The course integrated readings on conflicts in the Greater Yellowstone Ecosystem (GYE) that I had studied in the seminar and beyond. It also covered local environmental conflicts in San Diego and the Mexican border region. I included conflict-driven case studies, as well as a conflict resolution/mediation skills workshop into the class. The students were then given a case where they could practice their new skills. Students also read civic environmentalism/deliberative democracy literature in the course as theoretical background. In addition to the assigned readings and related theoretical literature pertinent to the course, students learned group dialogue dynamics, listening skills, collaborative problem-solving techniques as well as research, composition, critical thinking and analytical skills.

The class work culminated in a field research project that required groups of students to research and interview primary stakeholders on their specific local environmental issue. Students were to draw on the background of the GYE environmental conflicts and the civic environmentalism and deliberative democracy literature in their research on the local environmental conflict they studied. Students examined conflicts like water pollution and surfing; development near a local estuary along the U.S.-Mexico border; a proposed dump in inland North County San Diego; the local Multiple Species Conservation Plan and vernal pools; recreation use/habitat conflict over the La Jolla Children's Pool that has been populated by California seals; health issues along the San Diego-Tijuana River Valley; and transportation versus recreation (especially surfing) regarding a proposed toll road near San Onofre State Park.

Researching and interviewing local residents, sports enthusiasts, county and city officials and business owners helped bring home the complexities of the various environmental conflicts. Further, the students gained a meaningful appreciation for the various points of view and interests of the stakeholders and an understanding of the difficulties in solving the different conflicts. One of the most important lessons the students gained was learning to listen and take as valid the various positions voiced by the stakeholders, rather than simply deciding ahead of time whose point of view they agreed with and dismissing the others. This was an important lesson made during the faculty seminar and an essential one for the larger context of civic environmentalism and, indeed, civic democracy. Too often, students, citizens and faculty will choose a side they agree with and disregard the other points of view. However, the important lesson is that in a democratic society, we must be able to hear, understand, respect and even empathize with various stakeholders so that when we make collective decisions we consider the multitude of interests and try to at least address the concerns of all. My students learned during this class that conflict does not move the process of resolving an issue as much as implementing a more respectful collaborative process guided by the principles of civic environmentalism and civic democracy.

The class also had a highly reflective aspect in that students were required to keep a reflective journal on assigned readings and the research project. As is the case in all of my courses which incorporate case studies, students prepare case briefings—which deal with the questions at hand—background material for their given position, and, following the simulations, case debriefings which allow for in-depth reflection on what they learned. While I ask all of my students to do this to a degree, I focused more on this process in this course, as I thought they were applying new knowledge and skills in the cases and the project and needed additional reflection to fully incorporate the meanings of these experiences to their work and perhaps to their lives.

Impact on Students

On utilizing a conflict-resolution/collaborative management-style in a case, one student reflected:

> I particularly enjoyed the conflicts management and simulation. In this simulation, we got to try a different approach to the case. Rather than all the stakeholders battling to prove why their interests were the most important to be considered, everyone got to cooperate with one another and try to resolve the conflict. I think that this was an important strategy to learn about. Compromise and cooperation are important skills that everyone can apply to real-life situations on a daily basis.
> (Stephanie, student, PSCI 390L, spring 2007)

Another student described the challenge of role-playing a stakeholder:

> It can sometimes be difficult to take on the role of a stakeholder and feel passionately about that particular stakeholder's plight. I feel I really have to think critically to gain the understanding that I need to accurately portray the stakeholder…I had no idea how much was involved in my environmental conflict. There were numerous stakeholders that I never thought to consider. The conflict has been ongoing for 18 years [and] that makes it incredibly complex. Trying to sort through all of the available research material and my interviewees was another situation where I had to think critically and analyze the situation.
> (Brian, student, PSCI 390L, spring 2007)

Placing one's self in the shoes of a fellow citizen is one of the most important lessons of civic environmentalism and deliberative democracy. Learning to really listen with an open mind and comprehend the needs and concerns of others is key to collective and effective problem solving. Another challenge I hoped the cases would help to meet is the ability of students to apply these lessons to real-world scenarios. Victoria, a political science major, made the following observation:

> The experiences I had working on the field research were amazing! This was such an innovative approach for a research project. I enjoyed contacting local people involved with my research project on the proposed Gregory Canyon Landfill. The newspaper writer and the assistant director of the Department of Environmental Health were very helpful and they truly made my project what it turned out to be . . . I can definitely apply my experience from my individual project to other real-world scenarios. I will look more closely at items on the ballots because often the wording can be confusing and misleading, as was the case with Proposition B in 2004 regarding Gregory Canyon. This field research project impacted my learning because it exposed me to a new way of learning.
> (Victoria, student, PSCI 390L, spring 2007)

Application of Theory and Knowledge

This class also required students to apply the theoretical knowledge of civic environmentalism and deliberative democracy to the cases they simulated and later in the field research project. Students offered the following sentiments on what they had learned:

> Civic environmentalism is vastly important as it gets the voices of people to be heard. The more people become engaged, the better the outcome will be...Civic environmentalism helps everyone to sit down together and understand the perspectives of all the stakeholders.
> (Cale, student, PSCI 390L, spring 2007)

Erlinda, a liberal studies senior, explained:

> Civic environmentalism is when local citizens take action on issues that affect them. It allows the public to be part of the deliberative

> process so that policy makers can craft better policy. This allows them to be more effective because they receive input from the public. For example, environmentalists and ranchers got together to prevent urban development in Madison Valley. It was a good example of local citizens taking action on local issues.
> (Erlinda, student, PSCI 390L, spring 2007)

Christian, a sociology senior, noted the importance of these ideas in solving environmental conflict:

> Civic environmentalism deals with civic engagement and people's willingness to take a stance for environmental issues. Through civic environmentalism, it is possible for people to take a collaborative approach to solving an environmental problem, making it key to success in many situations.
> (Christian, student, PSCI 390L, spring 2007)

The course culminated in a field research-driven group project focusing on a local environmental conflict. Students told me they gained important insight into the usefulness of civic engagement techniques in attempts to solve these problems. Shaun, a history junior, made the following observation:

> Through the work that locals at the grassroots, the Humane Society and the city council did together, I saw an amazing collaborative process at a small level that really struck home as to how important it is that people, ordinary people, become involved, mitigate, work out and resolve conflicts that can benefit the needs of all.
> (Shaun, student, PSCI 390L, spring 2007)

When asked about the relationship between civic engagement and civic environmentalism in the research project, Amanda, a political science senior, wrote:

> The processes of civic engagement and civic environmentalism were directly linked in this project. The reading (Scholzmen, Verba & Brady) discusses civic engagement and three justifications that are made for civic engagement. The justifications (drawing on John Stuart Mill)[:] (a) civic engagement develops the capacities of individuals; (b) civic engagement

> . . . promotes community and democracy and . . . (c) is concerned with equal protection of interests among different groups. I certainly feel that conducting the field research, I was able to put these three justifications to the test. I definitely feel like I developed my own capacity to learn about an environmental conflict including: who the stakeholders were, what their complaints were, possible resolutions and solutions, why past resolutions/solutions were not successful, and where the conflict is heading in the future . . . I also gained a feeling I was connected to this conflict. It is something that is close, not too close, but close to my home. It is something that has the possibility to affect me and all of San Diego County's residents . . . The third justification dealing with equal protection of rights for different groups is something that was significant to my research. There are so many competing groups in this conflict. Each groups wants the conflict to end in their favor. Unfortunately, when resolving a conflict, often there is a winner and a loser or significant compromise for both groups in which they both feel they have lost a little and won a little. Each group in this conflict has had their rights protected. All groups' [interests] have been considered and continue to be considered today. This is a process in which everyone's rights continue to be an issue and will remain an issue until this conflict is resolved. (Amanda, student, PSCI 390L, spring 2007)

Conclusion

The Yellowstone seminar not only led me to create a class examining conflicts over land use and environmental issues (both in the Greater Yellowstone Ecosystem and perhaps, more importantly, in our own geographic backyards), but it also cemented in my mind the necessity to incorporate these ideas into all my policy courses. It is necessity for students to comprehend the numerous positions and needs of different stakeholders in various conflicts over resources, be they natural or financial, for it is imperative to facilitate social capacity, citizenship, civic engagement, and perhaps even democracy itself.

I know my students really grasped the necessity for collaborative decision making in the process of simulating the cases and from their observations of

real world environmental problems in their backyards. I imagine a number of them will continue to pay attention to these problems as they play out in the coming years. Students expressed a real appreciation for the efficacy of citizens they observed in their research projects. Perhaps some may even choose to become involved in these issues or others close to home. Students shared with me the myriad ways they utilized the lessons in other courses, their employment and even within their own families. A couple of students told me after the class that they felt the knowledge and skills they acquired would serve them well in their future careers as teachers and lawyers. As a result of the class, I think we have made progress toward developing more informed and involved citizens.

References

John, D. (1994). *Civic environmentalism.* Washington, DC: Congressional Quarterly Press.

Putnam, R. (2000). *Bowling alone.* New York, NY: Simon and Schuster.

Skocpol, T., & Fiorina, M. (Eds.). (1999). *Civic engagement and American democracy.* Washington, DC: The Brookings Institution.

Acknowledgment

The author wishes to thank the anonymous reviewers for their helpful comments on this chapter, as well as Vicki Golich, Christina Simokat and my students for helping me develop this pedagogical technique.

Citizenship and Sustainability: A Case for Revitalizing the Curriculum

James C. Pushnik and Scott McNall

Abstract—This article builds on the notion that democracy must be actively created and that universities have a key and essential role to play in educating students to be active citizens—key tenets of the American Democracy Project (ADP). Each author had a chance to realize the dream of seeing wolves in the wild and to learn about the issues which surrounded the reintroduction of wolves to Yellowstone Park in the 1990s. As intriguing as that process was, we determined that it was important for our students to focus and engage in environmental, social and economic issues in our own backyard. We used the concept of sustainability as an integrating perspective and focused on the issue of rapid climate change as a means to develop civic engagement projects across many disciplines. Our university has embraced sustainability as a core value and is seeking to integrate sustainability across the curriculum as one way to challenge our students to help create a democratic society.

Introduction

Shivering in the chill gray light of early morning in the Lamar Valley of Yellowstone Park, we watched tensely as the adults from the Slough Creek wolf pack returned from a successful night hunt. The cubs that had been tumbling about in front of the den came to attention and hurried to lick the muzzles of the adults as they sought their share of the kill. To see wolves in the wild is a unique and memorable experience. We had come to Yellowstone to explore issues surrounding the reintroduction of wolves to the

Seminar participants observe wildlife in the park just off the Cook City Highway at dawn.

park in the 1990s and to explore the heated controversies that still swirl around the costs and benefits of that decision.

The story of the wolves' reintroduction was a happy one for the stability of the park's ecosystem. Following the removal of the wolves from the park in the early 1900s, the park's biological systems were threatened by over-grazing from expanding herds of elk. The herds fed heavily on the young willows—responsible for stabilizing the riverbank—resulting in riverbank erosion. As the siltation process proceeded, the river depth decreased and, in turn, elevated water temperatures and threatened fish species. Regional food webs in the greater Yellowstone area subsequently became endangered, due to the hidden interconnectivity between shifts in river temperatures, habitat loss and competing demands on food sources. The reintroduction of the historic top predator, a keystone species, brought the system back into balance. It's a great success story until you spend time with guides who make a living hunting elk, or the ranchers who are dependent on grazing cattle on the land (some of it public) that surrounds the park. Their view of the reintroduction is quite different; they see economic hardships and the loss of family traditions. Thus, ADP's Yellowstone seminar sought to illustrate that democracy is a complex process; studying the reintroduction of wolves can provide students with an understanding that democracy depends on acknowledging controversy, recognizing and understanding differing perspectives, and working collectively to resolve issues.

Our campus, California State University, Chico, chose to participate in ADP because of a shared belief that democracy is not a given; it must be actively created and actively sustained. We shared ADP's belief in the role American universities must play in teaching about the responsibilities and practices of citizenship. We also shared concerns about the opportunities in American colleges and universities to practice democracy.

There are different ways to think about citizenship. For many, citizenship means little more than a right to vote; for others citizenship means an obligation to participate in the civic arena and to help resolve some of the many vexing problems that face us, such as war, poverty, pollution of our water supplies and degradation of the ecosystems that support our lives. Involvement requires awareness, understanding and practice to be successful.

Students—and citizens in general—face substantial barriers to participation and understanding. One barrier is the ideological divide we find in contemporary society. We need to do a better job of helping people separate fact from fiction and in explaining how science can and must inform social policy. As educators, we need to model civic skills. We need to provide opportunities for an open discourse and to listen respectfully to points of view different than our own. We need to show students how to find common ground for action, based on the values we share.

Ideas of civic responsibility are shaped by educational systems. From surveys of undergraduate university students, it's clear that they understand the right to participate in the voting process and have some basic knowledge of their individual civil rights, but there is little substantive knowledge of how democracy actually works or how they can affect change (Portney et al., 2007). Why has this happened?

First, humans have a limited psychological capacity in terms of the number of things about which we can worry. The number of worrisome things affecting students might include their social lives, their grades, their teachers, the environment, global inequality, water shortages and global conflict. For most people, the issues they confront are those that are an immediate threat to their health, welfare and safety, and they might not understand how problems are interconnected. This inability to perceive the connection between problems is the second obstacle. The third reason is that people do not see how problems can be solved. This means that for a university education to be successful in addressing these issues, students must practice problem solving. We need to help students become strategic thinkers, to see the dynamic connection between what often appears to be disconnected, such as the collapse of ecosystems, global inequality, food and water shortages, and volatile economies. So how do we equip students with the skills, attitudes and knowledge they need to create a sustainable future?

Engaging Students

After sharing our Yellowstone experience, we soon realized that as interesting as the story of the reintroduction of wolves might be, it was not going to be as relevant to our students as the array of environmental issues in our own backyard. We felt that we could identify case studies surrounding local

issues, ones in which students could become involved and would allow them to deepen their knowledge and act. We also wanted to provide differing points of view and different knowledge bases. The key to helping students understand connections was to introduce the concept of sustainability so that they could learn to focus on the links between social, environmental and economic issues.

Rapid climate change—with all of its related problems (rising sea levels, desertification, loss of species, pollution, collapsing economies)—is our starting point. Sustainability is directly relevant to students in California, as the state has been a leader in introducing legislation to curb global warming and reduce the carbon footprints of its citizens. In short, we can solve problems, whether in the university, local community or at the state level. We also chose rapid climate change because solutions require the involvement of virtually all disciplines in the academy including psychology, sociology, biology, history, philosophy, economics, engineering, agriculture and business. Drawing these diverse disciplines into a common conversation provides coherence in the curriculum and allows students to develop the tools to become informed and engaged citizens.

The ADP's Stewardship of Public Lands initiative aligned perfectly with some of what we were already doing on our campus. First, the program reflected our campus' commitment to our service area, which is geographically the size of the state of Ohio and has a wealth of public lands and natural resources but a small population with income levels below the national average. Second, the university acquired and manages a reserve system that totals over 4,000 acres and is adjacent to our city's 3,000+-acre park, Bidwell Park. Land-use practices of these contiguous properties are a continuing source of controversy in our community. Many citizens of our town would like to see open access to both parcels, but the university's vision is to regulate access and minimize human impact on the environment. Third, environmental issues are a strong concern of not only the local community, but the entire region as well. Concerns about land use, development rights, water rights, open space and quality of life animate our political discussion. We chose our effort to revitalize the democratic process and to emphasize stewardship and sustainability, because both build on the strengths and values of our institution and our region. This combined approach enhances our existing

academic strengths and our commitment to being responsible partners of the community. It also provides direct experiential opportunities for civic engagement for our students.

Our participation in the American Democracy Project led us to explore what is involved in the stewardship of public lands. Stewardship of public lands embodies the concept of the management and care of the commons. There are many approaches to this concept. Conservationists may have a very different idea of land stewardship from that of ranchers or developers, but each may be able to make a rational case for their proposed use of public lands. The role of citizen stewards in contemporary society demands a new form of engagement. It requires us to develop critical thinking skills that equip us to sort through the competing claims and arrive at our own informed decisions. It also demands that we become broadly literate, in not only political issues, but in the environmental, economic, social and cultural spheres of our shared experience.

Important to the project is the concept of the "citizen steward"—someone who can examine problems from local and global perspectives and think in critical and systematic ways. He or she must be willing to work cooperatively and responsibly with others, respecting cultural differences. Ultimately, citizen stewards must develop a sense of agency and be willing to adapt lifestyles in order to protect the environment. They must rise to the defense of human rights (Orr, 2004) and work through the political process to establish policies. This kind of citizenship cannot be given by decree; it must be grounded in the learning process (Gough & Scott, 2006). Citizenship is developed by intentional reflections on the responsibilities and actions of personal behaviors and our political and social institutions. Citizens do much more than simply energize a disenfranchised group to vote in an election. The citizen stewards of the 21st century must transform cultures.

Creating citizen stewards is not a simple challenge; it requires universities to reinvent themselves and to be more intentional in realizing one of the fundamental purposes of an education: to educate practicing and engaged citizens. It requires us to develop collaborative learning styles and engage students in research and service that is meaningful and empowering. We

must help students understand that they can and must create their own futures, and that their individual actions matter. We must develop clear understandings of the connections between spheres of sustainability. It is also important to underscore the need to help students find solutions to problems. As noted above, we need to work to integrate the curriculum, especially our general education curriculum.

Creating an Infrastructure

Universities need to have infrastructures not only to teach classes but to provide structured opportunities for engagement. Fortunately, we had and have much on which we could build. Our campus has a long and proud tradition of providing service-learning opportunities for our students. In 1966 the Associated Students (AS) established Community Action Volunteers in Education (CAVE), and the political sciences department has advised the Community Legal Action Center (CLIC) since 1970. Both of these organizations have helped provide meaningful internship experiences for thousands of students. A foundational lesson of these exceptional efforts is that the service activity has to be meaningful and connected to the curriculum. With the emergence of national and international acknowledgement of a need to provide sustainability education, we have been given an opportunity to expand on these programs across academic disciplines, and create new and energizing opportunities for service.

Several factors have set the stage for the integration of sustainability education across our campus culture. The Associated Students established the AS recycling program; the Environmental Action Resource Center (EARC); and elected an environmental affairs commissioner (EAC) in 1996. These groups provide service activities for our students and ensure that environmental issues are kept in front of the entire student body. In 2002, the Rawlins Endowed Chair of Environmental Literacy was established, with the charge to ensure that all students attending our university would gain an appreciation that their work and their careers were connected to the environment. In 2004, Paul J. Zingg, one of the original signatories of the American College and University Presidents' Climate Commitment, became the president of CSU, Chico. He asked the campus to examine the existing core principles that inform our work and reaffirm our commitment to providing an education that prepares students for the future. President Zingg

outlined a vision for our service region that argued for the creation of strong and vital economies, equitable and just societies, and a healthy environment. To codify this vision, the campus adopted a new strategic priority for our university: "Believing in the importance of student engagement and the need to create environmentally literate citizens, we will develop a sustainability plan for the campus that focuses on community outreach, the curriculum, and campus practices." This action heightened awareness and energized students, faculty and staff to come together and begin charting a path for our campus and community. In 2005, our campus completed a greenhouse gas emission audit to help develop a climate action plan that would set us on the path to be carbon-neutral. Faculty from across campus held environmental summits to discuss how we could most effectively use this "teaching moment" to integrate a vision of sustainability into our curricula and develop a set of common learning outcomes for sustainability-related courses. On our campus, we are using sustainability as the means to provide tighter connections between separate courses and to help students (and faculty) see that issues—such as rapid climate change—require transdisciplinary perspectives. Briefly, our means of doing so is to create a set of common learning outcomes for sustainability and then connect as many courses in general education as we can with several of the learning outcomes. It is our intention to have faculty continue to teach from the perspective of their discipline, but to emphasize and expand on at least one of the legs of the sustainability stool and show how it is connected to the others. We will assess students' environmental literacy, as well as their knowledge and understanding of what it will take to create a sustainable future and what their role must be.

We now have 165 green courses across all disciplines on campus that address sustainability. New programs were established that focused on renewable and sustainable construction. For the past five years, the Associated Students, in collaboration with the university, host the "This Way to Sustainability Conference," which has gained a national reputation and attracts over a 1,000 participants. In 2006, the campus entered into a public-private partnership with SunEdison and installed a 365-kilowatt solar array to help offset campus greenhouse gas emissions. Recognizing that our buildings are an outward expression of our campus' commitment to sustainability, as well as places where people learn about sustainability, the last two new buildings

were LEED certified: the student services building has a "gold" certification and the Wild Cat Activity Center is "silver" certified. Also, a campus-level sustainability coordinator position was created to help organize activities. In 2008, the Institute for Sustainable Development was established and formed a partnership with the local Chamber of Commerce to begin the process of helping local business owners understand the nature of the emerging "green" economy, as well as the future challenges they would face as a result of rapid climate change. These are tangible indicators of an institutional shift. But are we also influencing citizenship behavior?

Assessing Our Efforts

How are we to assess the effects of institutional change on the students and their mentors? One way will be to measure changes in student attitudes and behaviors. Another way will focus on changes in student learning outcomes as a result of their general education experience. There are also others measures, such as the number of student organizations that have taken root within our campus since the beginning of our sustainability initiative. Green Campus, a student organization, began identifying possible energy savings in the residence halls and substituting compact fluorescent bulbs for incandescent lights; they also installed a real-time metering system—developed by engineering students—that allows students to monitor their energy consumption. These efforts resulted in a rebate to the campus of close to $150,000, which was then used for more energy-saving projects. Another organization is Student Consultants of Office Practices (SCOOP), a group of students working with campus office staff to help implement energy saving and adopt sustainable office practices. Two student groups from the college of business are Net Impact and SCORE—Sustainability Competence Opportunity Reporting and Evaluation. As certified consultants, these groups have been working with the local community and businesses. The SCORE students contracted with the city of Chico to conduct a sustainability audit; upon its completion, the students returned their compensation because they felt as members of the community that they should contribute their skills to the city. On the academic side, the director of civic engagement, the dean of undergraduate studies, and faculty instructors have instituted a "Town Hall"

meeting as a capstone experience for all students in our Freshman University Life course. During the meeting, students select topics of concern to them now and as voters in the future. Recurring topics include environmental issues and sustainable development solutions.

In citing these examples, we hope to illustrate that by providing an opportunity for engagement, a venue for open discourse, and examination of issues of importance now and into the future allows us to foster democratic citizenship in our students. As our campus seal proclaims, "Today Decides Tomorrow." We are trying in every way to live up to that motto. Sustainability education is an expression of active citizen participation in policy decisions that will influence the future well-being and quality of our shared existence.

Keystones

The problem we identified was the need to educate citizens who will be able to deal with the significant challenges posed by rapid climate change. The path we chose is grounded in the values of our university and in our region with a focus on the environment. The pathway to success requires the development of an infrastructure that provides opportunities for students to solve real problems with the guidance and support of the faculty. More academically, the concept of sustainability and its components (the economy, the environment and the social order) is used to weave our general education curriculum together into a coherent whole and to add value to our students' education. Just as wolves are a keystone species restoring the health of Yellowstone's ecosystem, so too is the concept of sustainability in invigorating our campuses. It is a keystone concept that allows universities to create citizen stewards who understand the dynamic between the three spheres of the sustainability triad. Each university must choose a pathway that is appropriate to its setting, but a pathway must be chosen because the costs of not doing so are simply too high. Democracy itself is at stake, as is the welfare of future generations.

References

Gough,S and W. Scott. 2006. "Promoting Environmental Citizenship through Learning: Toward a Theory of Change." In *Environmental Citizenship.* Eds. A. Dbson and D. Bell. MIT Press.

Orr, D. 2004. "Four Challenges of Sustainability." In *The Last Refuge: Patriotism, Politics and the Environment in an Age of Terror.* Island Press.

Portney, K.E., L. O'Leary, E. S. Arezzini, A. L. Bethel, A. R. Bloom, S. L. Burstein, M.Clary, C.M. Dillon, C. A. Dunk, B. D. Fowler,M. E. Gallagher, C. S. Green, B. S. Hale, F. Allen Jones, Jr.,A. S. Lewis, L. Roffman, J.Uang, and J. E. Zlotoff. 2007. "Survey of Civic and Political Engagement of Young People." Tufts University. Available at: activecitizen.tufts.edu/downloads/FinalReport1.pdf

Acknowledgment

The authors would like to extend a special thanks to Dr. Sally McNall for her thoughtful editorial reviews of this manuscript.

Complex Citizenship: Framing an Integrative Pedagogical Approach to Prepare 21st Century Citizen Leaders

N. Scott Cole and Alix D. Dowling Fink

Abstract—Conceptualizing citizenship is important as we think about the future of civic education and mission-relevant pedagogical approaches for "value-added" higher education. As we argue in this chapter, 21st century citizens need to be integrative thinkers who can connect knowledge associated with science and politics in order to be effective participants in the political process. We contend that an interdisciplinary view of citizenship highlights the complexities of civic engagement in our age and offers guidance to educators and students who seek to develop citizenship skills. To that end, we developed an interdisciplinary course model that combined both scientific and civic content knowledge and process skills. After offering this class a number of times, we have concluded that students can develop skills related to complex citizenship and they can also articulately reflect on its inherent interdisciplinarity.

Conceptualizing Citizenship for Teaching and Learning

Many institutions of higher learning across the country have articulated mission statements focused on the development of engaged, effective citizens. In support of that argument, we cite our own institution as just one example of the significant goals that we in higher education have set out for our students. At Longwood University (Va.), we are "dedicated to the development of citizen leaders who are prepared to make positive contributions to

Seminar participants looking at Yellowstone River.

the common good of society" ("Longwood University Mission and Vision," 2009). In a recent update of our guiding principles, we acknowledge that citizen leaders are "the bedrock of the democracy. They are the reasons communities thrive. They are the people who make the United States of America what it wants to be. They make our nation work" ("Longwood University Mission and Vision," 2009). Finally, our institutional vision is to "transform capable men and women into citizen leaders, fully engaged in the world around them" ("Longwood University Mission and Vision," 2009). Furthermore, in the model of *Learning Reconsidered* (Keeling, 2004), we acknowledge that student learning outcomes like these are the responsibility of all members of the campus community.

Given that faculty at many institutions are charged with similar guiding principles, there is a growing need for pedagogical approaches to support these significant and meaningful goals, goals that are inherently transdisciplinary and synthetic. Therefore, in this chapter, we present a conceptual model of the complex citizenship our students will face in their post-baccalaureate lives, and we evaluate one course model designed to foster the civic skills, integrative learning and civic efficacy needed by "complex citizens."

Mission statements like the one cited above generally can be summarized into a few words: We want students to become good citizens. But what does it mean to be a good citizen? Scholars have identified direct political action, such as voting, joining political parties, participating in civic groups and signing petitions, as being essential to citizenship (Dalton, 2008). Another answer to this question is that democratic citizens should be knowledgeable about public affairs. Some academics contend, moreover, that positive orientations toward the political system are important. For instance, Almond and Verba (1965) argue that successful democracies must foster a "civic culture" that promotes trust and allegiance. While these ideals of good citizenship are widely accepted, they have been criticized for ignoring political reality. Studies show, for example, that millions of Americans do not vote or participate in community organizations (Hudson, 2001); political parties have lost members in recent decades (Wattenberg, 1996); trust in government has declined since the 1960s (Putnam & Pharr, 2000); fewer

Americans follow the news today than in the past (Putnam, 2000); and small groups of elites—not the masses—make most of the important political decisions in the U.S. (Mills, 1956).

Debates about "ideal" and "actual" citizens are important to follow, but they overlook a political shift that has changed what it takes to be a "good citizen." Specifically, scientific issues have moved to the center of the American political system in recent years. Arguably, the application of scientific knowledge by citizens has never been more important than it is today. Whether this shift has been caused by interest groups, the mass media or factors related to the modernization process, it is undeniable that today's most pressing problems require for their resolution both a greater knowledge of scientific content and a deeper understanding of science as a process with inherent strengths and limitations. In building on this idea of science as a key element of contemporary citizenship, the authors of this chapter have benefited from faculty development opportunities sponsored by the American Democracy Project (ADP)—especially the Stewardship of Public Lands initiative—and Science Education for New Civic Engagements and Responsibilities (SENCER). These organizations helped us better understand the new skill set necessary for 21st century citizens to be effective participants in the political process and thereby develop our pedagogical approach for fostering a parallel understanding in our students.

Our participation in the Stewardship of Public Lands seminar at Yellowstone National Park was a specific event that helped us create a better understanding of complex citizenship. As we listened to park biologist Doug Smith discuss the science and politics of wolf reintroduction, it became evident that 21st century citizens needed to think differently about politics and public affairs in order to be effective participants in key debates about our shared natural resources. They would need, for instance, a solid understanding of science in order to digest information and data related to contemporary social problems, especially information pertaining to the management of public lands.

In presenting this argument, we fully acknowledge that scientific issues have been a part of our political system for several decades. In the 1930s and 1940s, there were intensive efforts to fight polio, involving no other than

President Franklin D. Roosevelt himself (Oshinsky, 2005). Furthermore, President Kennedy sparked discussions about science as he called for the U.S. to put a man on the moon before the Soviets. In the 1970s, the perception of a more subdued spring brought forth environmental debates centered on science and resulted in some of our most notable legislative accomplishments for environmental protection, including the Endangered Species Act and the Clean Water Act.

A crucial distinction of contemporary politics, however, is the frequency with which key debates involve science and the centrality of science concepts to the issue itself. While scientific problems were discussed in the past, they were often peripheral to most political conversations. More attention was paid to welfare reform, taxation, global communism and Social Security. Today, by contrast, politicians deal with subjects involving science on a weekly or even daily basis. During the presidential campaign of 2008, for instance, Barack Obama and John McCain discussed science-centered topics, including stem cell research, space exploration, global warming and energy. Moreover, in the media-rich world of the 21st century, political debates on the national stage focus on the application of molecular biology to human and animal cloning and the fight against global pandemics like the swine flu. Finally, not even our country's international relations escape the lens of science, as Americans hear about Al Qaeda's "dirty bombs," uranium enrichment in Iran and North Korea, weapons of mass destruction, chemical warfare, and U.S. politicians negotiating with Brazil to obtain access to biofuels. For citizens following these debates, they are challenged to integrate the science, the policy, the politics, and the moral and ethical dimensions of these issues.

The Yellowstone wolves are an excellent illustration of how science and civics interact in the political arena. During reintroduction, for instance, scientists who supported wolves claimed that the ecosystem would benefit from their presence. Basically, they would help control the growing elk population, which was harming parts of Yellowstone's plant life and thereby the community of smaller organisms associated with it. Making an economic argument, moreover, wolf proponents argued that the region's economy would profit from increased tourism if wolves were reintroduced. As this

example shows, those favoring reintroduction were able to connect different branches of knowledge—science and economics—in order to buttress their arguments.

If this type of thinking frames contemporary political debates, our students should be encouraged to approach politics from this interdisciplinary perspective, especially if we want them to be effective citizens. Moreover, since politicians are debating scientific subjects, voters need to be able to understand the issues being discussed. Those citizens without an adequate understanding of science content may be duped by politicians and may lack information for making the best choices in the voting booth. For instance, when Republican Senator James Inhofe (Okla.) claims that global warming is a fraud, voters must decide if he is correct. Thus, to help citizens make better decisions at the ballot box, civic education programs should highlight and build upon the interaction between politics and science.

Implementing Complex Citizenship Approaches in the Classroom

Members of our campus communities are challenged to prepare students to engage these cross-disciplinary and integrative issues and to develop a skill set for the complex citizenship of the 21st century. How, then, shall faculty construct teaching and learning environments to foster that student development? At Longwood University, we developed a new pedagogical model for bringing together civic and science education. In our class, Science and Civics in Action, we connected scientific knowledge to the political process by highlighting government agencies and political actors who manage America's natural resources. The course was created as a result of our participation in the American Democracy Project's Stewardship of Public Lands faculty seminar, held in Yellowstone National Park. In the four years since attending the workshop, we have taught four iterations of the course in two parallel forms: a traditional semester-long version and a hybrid online version in which students spend a full week exploring the Greater Yellowstone area. Each iteration included a focus on the reintroduction of wolves to Yellowstone National Park, as well as other contentious issues of

natural resource management (mountaintop removal coal mining, bison management, etc.). Given the placement of the course in our general education curriculum, the class also integrated writing skills into the curriculum, seeking to help students understand the connection between effective communication and effective citizenship.

We next seek to outline how this pedagogical approach has promoted student learning and the development of knowledge and skills for complex citizenship. Specifically, in the next section of this chapter, we outline how students were affected by our class, focusing on their written comments and reflections on the Yellowstone experience. As the following reflections demonstrate, courses dealing with multiple disciplines can help students develop a complex understanding of politics.

The Impact of a Complex Citizenship Course

Is this model of teaching and learning effective in engaging students in developing a better understanding of what it means to be a citizen in the 21st century? This section seeks to answer this question by analyzing reflective essays that were written by students, thereby providing a snapshot of what students learned. While formal course evaluation forms could have been cited, these student essays present a more complete picture of individual attitudes, especially since they are in the students' own words rather than in a multiple-choice format.

Students Reflecting on the Yellowstone Experience

In the hybrid online version of the course, students spent a week in and around Yellowstone National Park. The travel schedule included sightseeing in Yellowstone and Grand Teton National parks; wildlife watching; meetings with stakeholders from the local ranching community, the Buffalo Field Campaign, local business owners and biologists; and intentional explorations of communities bordering these public lands (Jackson, West Yellowstone and Gardiner), using the Place as Text pedagogical approach (Braid & Long, 2000). This intense schedule engaged students in experiencing first hand some of the area's important management challenges.

When asked to reflect on these experiences, many students noted the ways in which they were affected by the experience: "When I was in Yellowstone,

meeting all of those people, it was like a whole new world." Students also noted a new sense of civic agency: "I really feel like I could make a difference now, when I did not feel that way before. The people we met and talked to in Yellowstone are so passionate about some very serious issues, that they have shown me that I need to be more passionate about things that are affecting my life too." In regards to this model of complex citizenship, it is important that students did cite growth in their own conceptions of citizenship. One student indicated that the course "helped me understand the roles of citizenship at a new level. I feel throughout school I have learned the role of citizens as just voting and being aware of politics." In addition to this broadening of the concept of citizenship, students noted an appreciation for ways in which they, as citizens, can make informed decisions: "I was able to learn how to be an active citizen who can make decisions by listening to all sides and then making my best decision."

Students Reflecting on Citizenship

The traditionally formatted full-semester course attempted to educate students about various aspects of the American political system. Of the three issues that were taught—institutional structures and processes, electoral motivations of politicians and collective action—students indicated that they learned most about the political process. According to one student, she left with "a better understanding of how to work within the government to accomplish a goal, as well as a better understanding of why the government seems to progress so slowly." Another student wrote, "Prior to this course, I did not know how to influence the legislative process and how to get political actors to listen."

Statements like these are encouraging because they highlight a sense of political efficacy, thereby indicating that these citizens believe to some extent that they can influence politics. Those citizens who have a high level of political efficacy are more likely to participate in politics. In regards to this pedagogical approach, it appears to have helped students understand that they could successfully navigate the political arena. As a biology major stated, "I have a much stronger understanding of the complicated process of gaining public support, persuading your opposition and turning that public support into political change." Finally, another student commented, "I learned what

it means to be a 'citizen' and how the political process can be excruciating but worthwhile."

Another goal of this class was to teach about collective action and the role played by interest groups. Students' reflective essays clearly indicated that this lesson was firmly entrenched in the minds of those who took the course. One student demonstrated this when writing about a class project: "Trying to reach a consensus was a long and frustrating process, and often the final decision was a compromise between the groups, which seems to be an excellent illustration of how the process of decision-making works in government." Others wrote more directly about the role played by interest groups: "Before this class, I didn't know the effect that interest groups had on the political process."

Students Reflecting on Science and Contemporary Citizenship

What about student knowledge of science? Did they leave this interdisciplinary experience with a better understanding of science? When reading their essays, we noticed a distinction between the science majors and the political science students in the full-semester course. The former group, obviously, was more familiar with the scientific material, while the political science majors experienced a steep learning curve. According to a political science major, for example, he "learned an unbelievable amount about the environment." Before taking this class, he "could not have told anyone the difference between an endangered species and a threatened species." This sentiment was reflected by other students. "As a political science major," one reflected, "I was only slightly aware of the environmental issues facing the world today. After taking the course, I feel as if I have a broader knowledge about biodiversity and the negative effects that humans and our growing society are having on the environment." Another person commented, "My knowledge on the biological side of this issue has grown greatly over the past semester."

For the authors of this chapter, these findings only reinforce the notion that students need to be exposed to more complex citizenship courses; in other words, scientific knowledge needs to be integrated with key issues from other disciplines and applied to contentious, real-world issues. The students

either reinforced and applied knowledge they already had, as in the case of science majors, or they were able to learn new ideas, as was the case for political science students. Given that many political science majors are likely to assume positions in the government, they need to be introduced to these ideas and how they can be used to solve public policy problems.

Students Understanding Complex Citizenship

A final issue to consider is whether students left this class with a better idea of what it takes to be a citizen in the 21st century. Some mentioned in their essays that citizens needed to combine science and politics to deal with today's public policy problems. One student commented, "This course was extremely beneficial and really helped me learn and grow as a citizen leader. It made me aware of the environmental issues facing society today as well as steps that I can take to make people aware of this issue." Another student wrote that as a result of completing the course, "we all became much more aware of our [environmental] surroundings and the political involvement in these issues." A political science major said, "Through the guidance of Science and Civics in Action, I have gained further knowledge of the legislative process, environmental degradation, and how the two operate together." Finally, one person commented that, "I was able to integrate both my new scientific understandings with my knowledge of the political process."

Conclusion

Students who took Science and Civics in Action demonstrated an understanding of complex citizenship. As one of them wrote, "I truly came to appreciate, through this course, how interrelated all the disciplines truly are." This leads us to conclude that the core goal of our course was met: We were able to help our students comprehend how science and politics can be used to develop a better understanding of public policy problems. Students who understand the complexities of citizenship will be better prepared to tackle the issues that face our nation and will be able to deal with them more effectively. In the future, therefore, civics teachers should think about including multiple disciplines in the curriculum.

References

Almond, G.A., & Verba, S. (1965). *The civic culture: Political attitudes and democracy in five nations.* Boston, MA: Little, Brown, and Company.

Braid B., & Long, A. (2000). *Place as text: Approaches to active learning.* National Collegiate Honors Council.

Dalton, R.J. (2008). *The good citizen: How a younger generation is reshaping American politics.* Washington, DC: CQ Press.

Husdon, W. (2000). *American democracy in peril: Seven challenges to America's future.* New York, NY: Seven Bridges Press.

Keeling, R. (Ed.) 2004. *Learning reconsidered: A campus-wide focus on the student experience.* National Association of Student Personnel Administrators and American College Personnel Association.

Longwood University Office of the President. (2009) *Longwood University mission and vision.* Accessed from longwood.edu/president/4731.htm

Mill, C.W. (1956). *The power elite.* Oxford, UK: Oxford University Press.

Oshinsky, D.M. (2005). *Polio: An American story.* New York, NY: Oxford University Press.

Pharr, S.J., & Putnam, R.D. (2000). *Disaffected democracies: What's troubling the trilateral countries?* Princeton, NJ: Princeton University Press.

Putnam, R. (2000). *Bowling alone: The collapse and revival of American community.* New York, NY: Simon and Schuster.

Watenberg, M.P. (1996). *The decline of American political parties, 1952-1994.* Cambridge, MA: Harvard University Press.

Afterword

To conclude this monograph on the Stewardship of Public Lands, we provide a thought-provoking essay by Holmes Rolston III, the 2003 Templeton Prize winner. Rolston is often considered the father of the field of environmental ethics. AASCU's American Democracy Project promotes the value of citizens actively involved in their communities, indeed fully engaged as "stewards of place." The Stewardship of Public Lands holds a distinct position among ADP initiatives in challenging educators and students alike to consider place in a fuller context. Beyond simply human-lived communities, the Stewardship of Public Lands challenges us to think about our responsibilities to place in a grander view. Rolston's essay advances the idea that education ought to engage students three-dimensionally—in cultural, rural and wild environments. His essay provides both context and consideration for those engaged in the stewardship of place.

Greening Education: The New Millennium

Holmes Rolston III

Abstract—Three-dimensional persons need encounters with cultural, rural and wild environments, else they are under-privileged. Although science discovers the biodiversity on Earth, and technology brings dramatic powers for development, neither can guide us in the deeper-values decisions about how to balance the three. Should we maximize sustainable development? Or prioritize a sustainable biosphere, working out an economy within a quality environment with abundant wildlife and wildlands? Economics alone cannot answer such a question. Educated persons today must be as environmentally literate as they are computer literate. Increasingly, being a resident on a landscape is as important as being a citizen. On this home planet, we cannot afford the poverty of a de-natured life.

Today's college students need to be wiser than Socrates. "The unexamined life is not worth living" (*Apology*). "Know thyself." The classic search in philosophy has been to figure out what it means to be human. That can't be done in this new millennium without a

complementary maxim: "Life in an unexamined world is not worthy living either." To put it bluntly, with his half-truth, taking it for the whole, Socrates went wrong.

In his search for the good life, Socrates loved Athens, which is well enough. A human is, as Aristotle put it, a "political animal" (*Politics*). We live in towns (Greek: *polis*), in social communities. We cannot know who we are without an examination of the cultures that shape our humanity. This is a strong argument for receiving a college education. But Socrates avoided nature, thinking it profitless. "You see, I am fond of learning. Now the country places and trees won't teach me anything, and the people in the city do" (*Phaedrus*).

John Muir (1965) knew better. When he finished his formal education and turned to live in the Sierra Nevadas, he wrote, "I was only leaving one university for another, the Wisconsin University for the University of the Wilderness" (p. 228). No education is complete until one has a concept of nature, and no ethics is complete until one has an appropriate respect for fauna, flora, landscapes and ecosystems. "Who am I?" warrants the more inclusive question, "Where on Earth am I?," which leads to the most urgent question of the new millennium: "What on Earth ought we to be doing?"

Place nature in your worldview; place your worldview in nature to become a three-dimensional person. The totally urban (urbane!) life is one-dimensional. Life with nothing but artifacts is artificial. Privilege comes through experiencing the urban, the rural and the wild. With this three-dimensional education, you can talk back to New Yorkers who think Manhattan is the center of the Earth. You can also deal with the Washington power brokers: "The best in life is outside the beltway."


Seminar participants gather around creek bank.

You can even startle scientists: "Science alone does not teach

us what we most need to know about nature: how to value it." A college education needs the natural sciences: physics, chemistry, geology, biology, ecology and even conservation biology. Certainly students will learn their facts about the richness of life on Earth and, hopefully, develop an appreciation for biodiversity that they cannot learn in philosophy, whether from Socrates or the postmodernists. But science is not conscience. One argument forbids moving from what *is* (description of biological facts) to what *ought* to be (prescription of duty); any who do so commit the naturalistic fallacy. Then again, ought not biologists (above all!) celebrate Earth's biodiversity?

Biology confronts every biologist (researcher and student alike) with an urgent moral concern: caring for life on Earth. Somewhat ironically, just when humans, with their increasing industry and technology, seemed further and further from nature, the natural world has emerged as a focus of ethical concern. It is not simply what a society does to its slaves, women, minorities, handicapped, children or future generations, but what it does to its fauna, flora, species, ecosystems and landscapes that reveals the character of that society.

But should we have more Wal-Marts, if this means fewer osprey? Is global capitalism unjust if it makes the rich richer and the poor poorer? Ought Nepali park rangers confiscate the cattle found grazing within tiger sanctuaries, even if the poor herders are starving? A people on a landscape will have to make value judgments about how much original nature they want, or wish to restore, and how much culturally modified nature they want, this way or that. Ecologists may be able to tell us what our options are, and what the minimum baseline health of landscapes is. But nothing in ecology gives ecologists any authority or skills at making these further social decisions. Prioritize economics. Do whatever to the environment, so long as the continuing development of the economy is not jeopardized thereby. Or ought we to prioritize the environment? Demand a baseline quality of environment and work out the economy within that? Sustainable development? Even if this threatens the tigers? Or sustainable biosphere? Even if the cattle owners go hungry?

"Man is the measure of things," said Protagoras, another ancient Greek philosopher (recalled in Plato, *Theaetetus*). Yes, humans are the only evaluators who can deliberate about what they ought to do conserving nature. When humans do this, they must set up the scales; humans are the "measurers of things," we prefer to say. But do we conclude that all we measure is what people have at stake on their landscapes? Cannot other species display values of which we ought to take some measure?

An education these days requires becoming environmentally literate, just as much as it does becoming computer literate. In curriculum evaluations on my campus, we asked what's different today from the classical education that the senior faculty got 50 years ago. The Pythagoream theorem hasn't changed, nor have Thomas Aquinas' five arguments for the existence of God, nor (despite studies from new perspectives) has the history of the Civil War. What's really new is the computer world, the Internet. And, almost paradoxically, what's really new is the environmental crisis. Education across most of the last century sought to produce *citizens*, leaders productive in their communities. That's another goal, half-true, which if taken for the whole, goes wrong. This generation, and those from here onward, need to know how to be *residents* on their landscapes, how to be Earthlings.

When a student goes home and says that before one can graduate he or she has to demonstrate environmental literacy; hence the summer field course in a national park, mom and dad may be doubtful. "Why do you have to get concerned about the chipmunks and daisies? Shouldn't you study something more serious? College costs a lot of money!" Those who study hard have an answer: "I have been searching for a land ethic" (Aldo Leopold). Or, if granddaddy is there and grew up on a farm, perhaps the best answer is: "When you graduate and commence in the world, you need to know how to kill something and eat it." Or at least to know your roots in the soil. Parks, wildernesses and national forests are, yes, places to get "away from it all," but even more, they are places to get "back to it all," encountering the protected reserves of elemental nature. The again, "back to" metaphors are always a little worrisome; better to say "down to it all." Outdoor experience there helps to protect a full answer to the question of human identity.

In the great outdoors one is immediately confronted with life persisting in the midst of its perpetual perishing. The seasons are evident: spring with its flowering; fall with its dieback. Park visitors may be at leisure, but the struggle out there is perennial; eating and being eaten, survival through adapted fit. That is the ultimate "dialectic," if we may use Socrates' philosophical word: Life is a search with opposites in conflict becoming complements in resolution. Wild nature is a vast scene of sprouting, budding, flowering, fruiting, passing away, passing life on. Birth, death, re-birth, life forever regenerated—that is the law, the nature of life. In town, too, people age and perish and reproduce and prosper, generation after generation. But immersing oneself in a "nature reserve" confronts us more directly and intensely than usual with this life struggle and life support in primordial nature. Life goes on—protected in the park—but on its own, wild and free.

Forests and soil, sunshine and rain, rivers and sky, the everlasting hills, the rolling prairies, the cycling seasons—superficially, these are just pleasant scenes in which to recreate, to get out of the classroom and into the field. At depth, however, these are the surrounding creations that support life. If one insists on the word, they are *resources*, but now it seems inadequate to call them recreational resources. They are the *sources* that define life. They are the ecosystems that humans inhabit, instrumental to civilization, but more than that: here is primeval, wild, creative source. Visiting the outdoors, one does go "outside," "out into" the country. One senses how much in the world was put in place without any human activity; one wonders what is our artifacted place in such a nature-placed world. Experiences of such values may be soft. They are also deeply educating. They can be had in rural nature, but for most students today, such experiences are primarily found on public lands.

Humans depend on airflow, water cycles, sunshine, photosynthesis, nitrogen-fixation, decomposition bacteria, fungi, the ozone layer, food chains, insect pollination, soils, earthworms, climates, oceans and genetic materials. These ecological values contribute positively to human experiences. But they also seem to be there apart from humans being here. Nature is an evolutionary ecosystem, with humans a late add on. In the woods, a first impression is that this is not where I live; the whole idea of being in the backcountry is being somewhere different from where you live. But a second and deeper

impression is that this is where we do live, our cultures superposed on natural systems. We re-contact the natural certainties—only to realize that they are less certain now than ever before in this history of the planet.

An ecological perspective makes it clear that culture remains tethered to the biosystem and that the options within built environments, however expanded, provide no release from nature. An ecology always lies in the background of culture, natural givens that support everything else. Some sort of inclusive environmental fitness is required of even the most advanced culture. Whatever their options, however their environments are rebuilt, humans remain residents in ecosystems. This is a truth for rural and urban people, but what better place to learn it than in protected nature reserves, where we turn aside from our labors and take this wider, more ecological perspective.

Environmental awareness is vital because the survival of life on Earth depends on it. The main concerns on the world agenda for the new millennium are: war and peace, escalating populations, escalating consumption and degrading environments. They are all interrelated. For the first time in the history of the planet, one species jeopardizes the welfare of the community of life on Earth, as with global warming and extinction of species. Ecology is about living at home (Greek: *oikos*, "house"). Figure out this home planet. What's new about education is that this has become the most inclusive concern of all: figuring out the human place on the planet.

The educated person today doesn't want to live a de-natured life. Humans neither can nor ought to de-nature their planet. You are not educated for the new millennium unless examining your life leads to getting put in your place in your encounters with once and future nature.

References

Muir, J. (1965). *The story of my boyhood and youth.* Madison, WI: University of Wisconsin Press.

Author Biographies

Charles Amlaner was the chairperson of the departments of life sciences and ecology and organismal biology at Indiana State University, until a recent move to his current position as vice president for research and graduate dean at Kennesaw State University (Ga.). Amlaner is a behavioral physiologist who studies sleep patterns in laboratory and wild animals, and has worked as a consulting scientist for the Arkansas Game and Fish Commission and the Indiana Department of Natural Resources.

Margaret M. Avard received a B.S. in geology from Centenary College of Louisiana in 1984, a M.S. in geosciences from the University of Texas at Dallas in 1991 and a Ph.D. in environmental science from the University of Oklahoma in 1998. She has taught at Southeastern Oklahoma State University since 1989 and is currently a professor of Earth and environmental science. Research interests include elementary science education, student-centered learning, and water conservation, quantity and quality in Oklahoma.

Breanna Bartosz graduated from Weber State University in 2008 with a degree in zoology. After traveling to the Amazon she began working for the Utah Division of Wildlife Resources. Her experience includes conducting land trend studies and working with brine shrimp and waterfowl on the Great Salt Lake. She currently works in St. George Utah monitoring desert tortoise populations. She enjoys nature, traveling, hiking and spending time with her pets.

Dawn Blasko is associate professor of psychology at Penn State Erie, The Behrend College. She involves undergraduate students in research on the cognitive neuroscience of language and spatial thinking. She teaches research methods, cognition, cross-cultural psychology and civic engagement. Blasko is a fellow in the Laboratory of Public Scholarship and Democracy at Penn State.

Ron Brunner is an independent policy scientist and, since 2007, professor emeritus of political science at the University of Colorado, Boulder. A native

of Colorado, he was educated at Yale University where he received a B.A. in 1964 and a Ph.D. in 1971. Before returning to Colorado in 1981, he was a research associate at Harvard's Center for International Affairs, a research assistant on energy policy in Congress and a tenured faculty member at the University of Michigan. He has served as president of the Society of Policy Scientists and editor and advisory board member of its journal, Policy Sciences. He has applied the policy sciences to problems in energy, social welfare, space, education, natural resource and climate policy. His most recent books, co-authored, are *Finding Common Ground* (2002), *Adaptive Governance* (2005) and *Adaptive Governance and Climate Change* (2010).

Tait Chirenje is an environmental chemist who is currently an associate professor of environmental science and geology at the Richard Stockton College of New Jersey. He teaches various courses in environmental chemistry, toxicology, pollution and remediation. He works with off-campus groups on issues relating to sustainability and is active in the American Democracy Project. Dr. Chirenje is a co-leader of the sustainability and environmental policy track, the Stockton campus sustainability initiative and directs the professional science master's.

Bryon K. Clark is dean of the School of Graduate and University Studies and professor of biology at Southeastern Oklahoma State University. He holds a B.A. in biology from Central College, a M.S. in biology from Western Illinois University and a Ph.D. in biology from Kansas State University. Following a post-doctoral position at Oklahoma State University, he moved to Southeastern. Clark's research includes ecological studies of bats, rodents and shrews and assessment of student learning.

N. Scott Cole is associate professor of political science at Longwood University. He teaches courses focusing on comparative and international politics, in addition to democratization and civic engagement. Cole is also the campus coordinator of Longwood University's American Democracy Project.

John Conant is the chairperson of the department of economics and the director of the Center for Economic Education at Indiana State University. He works in economic education, the economics of education and economic

analysis of public policy issues. Conant conducts professional development seminars and workshops for K-12 teachers and educational leaders in economic education, entrepreneurship and financial literacy.

Kristen Gurr Ellis is a zoology student at Weber State University with a projected graduation in the fall of 2009. She is currently conducting research on shorebird ecology in Utah's wetlands. Gurr plans on going to graduate school in conservation biology. Her ultimate goal is to work for an organization such as the World Wildlife Fund to create and carry out plans to conserve endangered species.

Alix D. Dowling Fink is associate professor of biology at Longwood University. While she continues an active, student-centered research program in vertebrate ecology, Fink is currently involved in collaborative interdisciplinary projects across the university, working with colleagues in mathematics, political science and art. One of those projects, LU@YNP, has resulted in four teaching-and-learning immersion trips to Yellowstone.

Scott A. Frisch is professor of political science and chair at California State University Channel Islands. He is the author of *The Politics of Pork* and co-author (with Sean Q Kelly) of Committee Assignment Politics in the U.S. House of Representatives and Jimmy Carter and the *Water Wars: Presidential Influence and the Politics of Pork*. His areas of expertise include Congress, public budgeting, public policy and the politics of public lands.

S. Kay Gandy is an associate professor in the school of education at Western Kentucky University. She also serves as a coordinator for the Kentucky Geographic Alliance.

Jonathan Hall is senior lecturer of physics at Penn State Erie, The Behrend College. He teaches introductory physics and astronomy courses using student inquiry methods, and assists in team-teaching a civic and community engagement course. He is currently chair of the coordinating committee for the Civic and Community Engagement minor at Behrend College.

Thomas T. Holyoke is assistant professor of political science at California State University, Fresno. Most of his research focuses on competition between

interest groups in the United States to influence public policy, especially in the areas of environmental and water policy, education policy and banking policy. Recent articles have appeared in journals such as the *American Journal of Political Science, Political Research Quarterly, Policy Sciences, Education Evaluation and Policy Analysis*, and the *American Journal of Education.*

Lisa Honaker is an associate professor of British literature at Stockton College, where she specializes in 19th through 21st century British literature and popular culture. She coordinates Stockton's Ordinary Lives of Engagement project, which brings citizen-activists onto campus and sends students to work with community organizations, fostering an exchange of ideas and resources. She also directs Stockton's Political Engagement Project, a Carnegie Foundation and American Democracy Project-sponsored initiative that seeks to promote student political engagement.

Soleiman Kiasatpour is an associate professor of political science at Western Kentucky University. He has a doctorate in political science from the University of California at Riverside. He teaches American government, Middle East politics, and international relations. His research interests include pedagogy, regime transitions and public diplomacy.

Elizabeth Latosi-Sawin, professor of English and honors program director at Missouri Western State University has taught composition, creative nonfiction and British, Native American and environmental literature. She has presented or published with faculty in education, chemistry, psychology, business, physical education and recreation. Recipient of the Governor's Award for Excellence in Teaching, Latosi-Sawin directs Outdoor Semester, a theme-based, multi-disciplinary faculty/student learning community that offers students rare experiential and intercultural learning on the Great Plains.

Scott G. McNall is currently executive director of the Institute for Sustainable Development at California State University, Chico. He also served as provost of the university (from 1994-2007) and for one year as interim president. His Ph.D. is in sociology and his numerous publications have addressed issues of social theory, mobilization, social change and organizational dynamics.

James C. Pushnik currently holds the Rawlins Endowed Chair of Environmental Literacy at California State University, Chico. The primary focus of this position is to ensure that all students at CSU, Chico are provided with learning experiences that systemically connect socio-economic activities with environmental conditions. Pushnik's doctorate is in plant ecological physiology, and he has authored numerous publications that address the consequences of environmental change on the performance of natural systems.

Donald Rodriguez is associate professor and chair of the Environmental Science and Resource Management program at California State University Channel Islands. His research interests are divided between urban wildland interface issues, minority involvement with protected areas, and coastal management problems in the U.S. and abroad. Professor Rodriguez holds a B.S. in wildlife zoology, an M.S. in environmental education and a Ph.D. in the human dimensions of natural resource management.

Holmes Rolston III is university distinguished professor and professor of philosophy emeritus at Colorado State University. He was Templeton Prize laureate in 2003. Advocating environmental ethics, he has lectured on seven continents. Rolston is featured in Fifty Key Thinkers on the Environment (Joy A. Palmer, Ed.).

Steve Spencer is a full professor at Western Kentucky University and the senior member in the Recreation Administration program where he serves as graduate coordinator. He has been at WKU since 1990 and in higher education since the early 1980s.

Tammie Stenger-Ramsey is an assistant professor at Western Kentucky University in the Recreation Administration program. Since she began teaching in higher education, she has sought to involve students in civic engagement activities and service-learning projects to help them apply the theories and concepts learned in the classroom to real-world situations.

Pamela Stricker is associate professor of political science and a founding faculty member of the environmental studies program at California State University, San Marcos. She also serves on the editorial board of the peer-

reviewed journal *Latin American Perspectives* and the Council of Science, Technology and Environmental Politics subsection of the American Political Science Association. Stricker directs CSUSM's American Democracy Project and participated in the ADP's summer 2006 Stewardship of Public Lands seminar at Yellowstone. Her book, *Toward a Culture of Nature: Environmental Policy and Sustainable Development in Cuba* was published in 2007.

Rod Troester is associate professor of speech communication at Penn State Erie, The Behrend College. He teaches communication research methods, business and professional speaking, organizational communication, and small group communication and civic engagement. Troester has directed The Janet Neff Sample Center for Manners and Civility.

Sam Zeveloff received his Ph.D. in zoology from the University of Wyoming. He has been on the faculty of Weber State University since 1984, serving as chair of the department of zoology since 1987. He is interested in mammalian ecology and conservation. Zeveloff has been fascinated by the raccoon for many years, an interest that resulted in his authoring the book *Raccoons, a Natural History* (Smithsonian Institution Press).

Acknowledgments

The Stewardship of Public Lands could not have been created without the help of many individuals, and the development of this monograph adds an additional roster of contributors. I want to take a moment to recognize many of the people who have made significant contributions to both the initiative and this monograph.

Notable among those that helped create this program are our colleagues at the Yellowstone Association. Pat Cole, the executive director and Jeff Brown, director of education, were instrumental in helping design the project back in 2004. Jenny Golding was brilliant in turning a concept into a program, and this past year her successor, Nick Derene, has been equally effective. The instructional program was first developed by Jim Halfpenny and Norm Bishop, further extended over three years by Mike Yochim, and now capably directed by Brad Bulin—all Yellowstone Association instructional staff.

A second special thank you goes to the 100+ faculty members from more than 50 AASCU institutions who have participated in this initiative over the past five years. Many are represented in the pages of this monograph, making a special contribution by sharing their ideas. But countless others, indeed virtually everyone who has participated, has taken the experience in Yellowstone and transformed it into creative and imaginative programs for undergraduate students. For all of those who work daily to prepare a new generation of informed, engaged citizens for our democracy, my deepest thanks.

A special recognition has to be given to the talented group of faculty who took on the role of developing, organizing and editing this monograph. This monograph simply would not exist if it were not for the creativity, dedication and scholarship of the editorial committee. They worked tirelessly to create a vision of the monograph, contact potential writers and review multiple drafts of entries. I am enormously indebted to Dawn Blasko, Alix Fink, Jill Brady Hampton, Kay Gandy, Kaye Holman, Soleiman Kiasatpour, Patricia Loughlin and Pamela Stricker for their service. And I'm certain that all members of the committee would join me in recognizing the enormous role

that Scott Cole undertook, as the committee chair, in making this dream a reality. My heartfelt thanks to each of these individuals for a job well done.

I would be remiss if I also didn't recognize Cecilia M. Orphan, the national project manager, for her many contributions to this initiative and the many other programs and activities of the American Democracy Project. She not only coordinates all of the far-flung ADP activities, but is also the energy and talent behind much of the project's work. For this monograph, Cecilia served as the liaison between the committee and our offices. She facilitated the work of the committee, making sure that everyone had manuscripts, a meeting place at the annual ADP meetings, and a host of other details. She worked closely with our communications department as the manuscript moved from draft to finished product. And along the way, in addition to her other operational assignments, she served as a wise and thoughtful editor for my foreword.

Finally, I wish to acknowledge the talented contributions of Jennifer Dawn Herrera, AASCU's manager of editorial services, and Trudy James, AASCU's manager of publications, who edited and designed the monograph, respectively.

To everyone who has touched this project, my thanks for your insights, wisdom and creativity. As I said in my foreword, the experience with so many bright and talented people, who have brought their ideas and imagination to enrich us all, augers well for the continuing strength of our democracy.

—George L. Mehaffy