Merging Polarized Views of Nonconsumptive and Consumptive Natural Resources Use in the University Classroom

Jeanne C. Jones, *Department of Wildlife and Fisheries, Mississippi State University, MS 39762*

Abstract: The introductory level fish and wildlife conservation course at Mississippi State University has an enrollment of over 100 students each semester. Students in the class generally exhibit a diversity of attitudes about fish and wildlife conservation that range from anti-hunting to consumptive and extractive use advocates. Finding common ground among these students is challenging, but essential for the creation of an interactive, learning environment that focuses on sustainable use of natural resources. Ecological principles of fish and wildlife conservation are linked to current issues through class discussions. The class offers a setting in which wildlife and fisheries science majors can discover the diversity of stakeholders and issues that influence natural resource conservation while learning basic ecological and conservation principles. Discussion topics and methods used in this class are presented.

Today, wildlife and fisheries management is greatly influenced by the diversity of conservation issues and stakeholders that exist with growing human population demands on limited resources and ecosystem management initiatives (Peyton 1987). To meet the diverse demands of the public and to accomplish successful conservation efforts, natural resource professionals must be able to work together and cooperatively with other professions and interest groups. Most state and federal agencies now utilize interdisciplinary planning teams to address large scale, conservation programs (Cubbage et al. 1987). According to Elizabeth Estille, Southeast Regional director of the U.S. Forest Service, today's diversity of public attitudes and uses of renewable natural resources have produced a need for future natural resource employees with the ability to work on a "team".

To prepare students for today's natural resource careers, university educators must continue to teach technical scientific skills, principles of ecology and biology, and conservation. However, we should also prepare students for the array of stakeholder attitudes and objectives of other professionals who may influence or assist in planning natural resource use and management. Many universities have met this

challenge by offering courses in natural resource policy, human dimensions, and applied seminar courses, in which students address conservation issues through proposed management scenarios. These courses are generally upper level courses, taken by natural resource juniors and seniors. Undergraduate, freshman level courses can also provide an excellent arena for teaching linkages between ecology, conservation, and a diversity of issues surrounding natural resource use. Introduction of this information early in students' programs can be advantageous, because students are able to integrate this knowledge and synthesize their philosophies over their 4-year undergraduate program.

My primary goals in preparing this paper are to offer suggestions for introducing college students to the broad array of issues and interests that influence fish and wildlife conservation so that they may become more effective conservation professionals. This paper is intended to stimulate thought and action among fish and wildlife professors, instructors, and information specialists on ways of presenting issues so that people begin to see the multitude of belief systems and issues involved in fish and wildlife conservation. I thank Dr. Dale Arner for being my mentor and "sounding board" on wildlife conservation issues for over 15 years. I also thank over 900 students who do not realize that I learned more from them than they learned from me.

Background

Introductory classes in natural resource conservation can exhibit a diversity of students and student attitudes concerning extractive, consumptive, and non-consumptive uses of fish, wildlife, range, forest, and water resources. The introductory wildlife and fisheries conservation class at Mississippi State University (MSU), with an enrollment of 100 students each semester, is such a class that includes students with very different attitudes, backgrounds, and career goals. The diversity of student attitudes in this class is due, in part, to class availability to all campus majors and the popularity of fish and wildlife conservation. Because the course is required curriculum for wildlife and fisheries majors, they generally comprise >60% of the enrollees. The remaining students ($\leq$ 40%) are students of other majors. As professor of the class for 11 years, I have observed a student body that is comprised of students with majors in fish and wildlife science, forestry, animal science, environmental science, biology, anthropology, engineering, horticulture, business and finance, pre-veterinary science, landscape architecture, education, and climatology. In addition to diverse backgrounds, these students also report various sources of conservation information and exhibit varying knowledge levels about fish and wildlife conservation. Since 1990, students in the class have reported that their pre-college information sources about fish and wildlife have been television ($\geq$75%), relatives and neighbors ($\geq$80%), high school biology teachers or classes ($\geq$45%), and/or other organizations, youth camps, or training programs, such as 4-H club and hunter education ($\geq$35%). Personal attitudes about wildlife and fish use may range from anti-hunting to consumptive and extractive use advocates. Many students believe that conservation issues are characterized by the polarized 2-sided arguments depicted by the mass

media (Kalberg 1997). As discussed by Kalberg (1997), I have observed that this adversarial depiction and position often precludes constructive discourse, obscures values and beliefs, and alienates user groups. Finding common ground among these students is challenging, yet essential for the creation of an interactive, learning environment that focuses on sustainable use of renewable natural resources. Furthermore, using this classroom environment can simulate a setting that resembles the diverse interest groups with whom wildlife and fisheries students may work in the future.

Teaching Approach

The introductory level course, Introduction to Wildlife and Fish Conservation, includes 2 80-minute lectures each week. Basic conservation topics include an overview of history, values, and principles of wildlife and fish ecology, management, and conservation. During the last 15 minutes of each class session, we discuss conservation issues that relate to the technical lecture topics of the day. These discussions focus on existing case studies in fish and wildlife management in which ecological principles, economic considerations, and multiple stakeholders are involved. These discussion periods serve multiple educational purposes, including a) providing "real world" examples that elucidate conservation lecture topics, b) encouraging student involvement and interaction, c) promoting methods of professional communication methods, and d) revealing the diversity of attitudes and belief systems that surround conservation and natural resource use. The following case studies are used in class to illustrate the many values systems affecting natural resource planning, the potential areas of conflict, and potential solutions to conflicts using ecological, economic, and multiple value systems.

Population Management and Animal Harvest

Few issues in wildlife and fisheries conservation evoke more sentiment than the anti-harvest versus pro-harvest debates. Many values and belief systems are involved in oppositions to hunting, recreational hunting, and subsistence hunting (Kellert 1978, Minnis 1997). This fact becomes evident in my classes when we discuss wildlife and fish values and biological principles of population management. We focus class discussion on ecological principles and foundations for population management as recommended by Kellert 1978. Ecological concepts and case studies of intensive herbivory are used to demonstrate the importance of predation and hunting in maintaining native biological diversity and habitat quality. Data from white-tailed deer (*Odocoileus virginianus*) exclosure studies in south Mississippi (Jones et al. 1997) and other cervid studies (The Wildl. Soc. 1997) are discussed. These discussions include topics of browsing impacts on plant diversity and community structure, nesting habitat for nongame birds, soft mast production for game and nongame wildlife, and occurrence of rare plants. Students are challenged to consider the role of human predation on cervid population that are no longer limited by wild predators in the southeastern United States. Additional discussions focus on consumptive use, ecotourism,

and economic values of quality deer management programs and the potential bene-ficial effects of such values on habitat conservation for a diversity of other wildlife. With this approach, students begin to realize that habitat quality for nongame wild-life, outdoor recreation, revenue generation from hunting, habitat conservation and acquisition, and protection of rare species are all related to large herbivore popula-tions and their management. This topic can also promote an understanding about the need for integration of wildlife management efforts among game and nongame biologists.

Threatened and Endangered Species

Threatened and endangered species conservation is many times portrayed by the media as being a polarized issue with 2 diametrically-opposed positions (Kalberg 1997). This view is especially prevalent in the attitudes expressed by forestry, animal science, business, and agricultural majors. In many cases, protection of the featured species is portrayed as, or believed to result in, projects being stopped or extractive land use being totally restricted, ultimately resulting in loss of revenue and jobs. At the other extreme, some students express a belief that natural resource use is always destructive to protection of declining species. Sources of this information may stem from highly publicized decisions that were rendered in the snail darter–Tellico Dam project or the spotted owl–timber extraction cases. Regardless of the catalyst for their beliefs, the examples from which many of my students have formed their attitudes may simplify the complexity of and obscure underlying values concerning this issue. To broaden their perspectives on endangered species, students are introduced to the ecology and values of selected protected species. We discuss economic and medici-nal values of protected species community associates, such as the Pacific Yew tree, a midstory plant indigenous to old growth spotted owl habitat and the botanical tem-plate for Taxol, a cancer treatment drug. Additionally, we focus on case studies where extractive timber use is integrated with threatened and endangered species conservation on public lands and corporate timber lands through habitat conservation planning. Specifically, we discuss forest management techniques being used on pub-lic and commercial forest lands that protect or recover gopher tortoises (*Gopherus polyphemus*) and produce pole and pulp timber commodities (Bullock et al. 1997). In lieu of mutually exclusive agendas, these approaches can accomplish sustainable use of forest commodities, restore selected ecosystems, benefit other nongame and game species associates, and result in habitat conservation for a federally threatened spe-cies. Other examples used are the Louisiana black bear (*Ursus americanus luteolus*) conservation initiative and integration of military training with protection of over 60 state- and federally-listed species at the Army National Guard training site, Camp Shelby, Mississippi (Black Bear Conserv. Comm. 1996, Jones and Bucciantini 1998). Students are introduced to the array of interest groups involved in threatened and endangered species issues by reviewing the aforementioned cases, grizzly bear recovery, and spotted owl protection. Through these discussions students begin to realize that in addition to timber and environmental interest groups, other stakehold-ers may include consumptive fish and wildlife recreationists, non-consumptive use

recreationists, Native American tribes and coalitions, ecotourism industries (lodging, equipment, restaurants, guide services), commercial and subsistence fishing, ranchers, farmers, developers, mining companies, and professional natural resource organizations.

Regulations—Too Many, Too Few?

Germaine to student attitudes about the Endangered Species Act is the common concern about federal and state environmental regulations. Many students express a strong belief that too many restrictions exist for economic growth and that compliance with all existing regulations is impossible due to the mere numbers of laws. Once again, at the other extreme are class members who believe regulations are too few, not strict enough, and that enforcement and penalties are often lax.

Many students believe that regulations are "new" and are a product of a pro-environmental extremist society. Discussions focusing on the era of exploitation and wildlife restoration during the 1800s in the United States show students that regulations were key components to recovery of many of today's common game and fur-bearer species. We investigate conditions that led to the passage of key Federal acts, such as the Marine Mammal Protection Act, The Clean Water Act, the Endangered Species Act, and the Clean Air Act. These topics give students a historical basis for understanding the catalyst and the original need for regulation development.

To address the concern that strong environmental standards threaten economic development and eliminate jobs, we discuss economic conditions of 12 states (such as Colorado, Vermont, and Oregon) that rank among the top 12 nationally in both environmental and economic quality and cite reasons for this ranking. Students begin to realize that ecotourism dollars stemming from fish and wildlife recreation and successful natural resource conservation programs are primary sources of income for these states. Additionally, they discuss how environmental quality is integral to maintenance of fish and wildlife conservation, ecotourism, life quality, and attraction of technologically-advanced industries that provide jobs. Very few students realize the total economic impact of wildlife and fisheries recreation on a national scale. To put the $104 billion figure that Americans spent in 1996 on fish and wildlife recreation on a relative scale, we compare economic impacts of other industries, such as new car sales that earned $81 billion in 1996 (U.S. Fish and Wildl. Serv. 1997). Other information shared includes hunting's 35th-place ranking in America's Fortune 500 businesses and the number of jobs produced by fishing, hunting, and nonconsumptive use recreation (U.S. Fish and Widl. Serv. 1997). Discussions on growing demand for outdoor recreation and actual revenue generated from permit, lease, and guide service arrangements are instigated to stimulate ideas about income generation and diversification from wildlife and fish recreation on private lands. Emphasis is placed on possible sustainability of revenue generated from fish and wildlife habitats that have proven marginal for agricultural or other land use (Jones et al. 1998).

Concerns about the number of regulations and adequate compliance on the land base can be addressed by providing students with examples of land and water

management where regulatory mandates and natural resource use are accomplished. The primary example used with success in my classes has been streamside management zones (SMZ's) through which managers can comply with the Clean Water Act, the Endangered Species Acts, and selected state regulations. Students assist in listing the multiple benefits that can be gained from leaving adequate SMZ widths along streams and stream associated wetlands with benefits including protection of state- and federally-listed plants and animals, production of quality timber products, provision of travel corridors, protection of water quality from nonpoint source pollution, mast and cavity production for game and nongame wildlife, deadwood maintenance for herpetofauna, maintenance of aesthetic quality and outdoor recreation opportunities, and protection of streambank and channel integrity. On a landscape scale, we relate these management measures to the 18,130 Km^2-hypoxic zone in the Gulf of Mexico and the economic ramifications of no regulations on nonpoint and point source pollution on marine resources. By exploring these ideas, students realize that although regulations are written as separate documents, careful planning and prudent use of natural resources can create compliance with many regulations and directives that effect fish and wildlife conservation on landscape scales. Furthermore, studying the history of conservation from early regulations to present day initiatives—successes and failures—helps students understand the need and methods for developing successful integrated management approaches.

Conclusion

Today wildlife and fisheries educators must continue to teach many technical skills to prepare students for natural resource careers. However, we must also prepare them for a world of increasing demands on natural resources and a diversity of attitudes about use and conservation of those resources. If we begin to emphasize wildlife and fisheries management scenarios in which multiple uses are accomplished cooperatively between other professions and natural resource professionals, perhaps our students will be better equipped to manage conflict and work cooperatively with natural resource issues in the future. Concentrating on linkages between ecological processes, economic and intrinsic values of fish and wildlife, and existing case studies in the introductory fish and wildlife conservation course at MSU seems to bring cohesion to diverse student groups who will one day be our natural resource conservationists and the voting public.

Literature Cited

Black Bear Conservation Committee. 1996 Black bear management handbook for Louisiana, Mississippi, southern Arkansas, and east Texas. Black bear Conserv. Comm., Baton Rouge, La. 12pp.

Bullock, J., J. C. Jones, G. Cleveland, H. C. Durham, and W. B. Dennis. 1998. Gopher tortoise conservation plan on International Paper Company lands in Alabama and Mississippi. Internatl. Paper Co., Jackson, Miss. 36pp.

Cubbage, F. W., J. O'Flaughlin, and C. S. Bullock, 1993. Forest resource policy. John Wiley and Sons, Inc. New York, N.Y. 562pp.

Jones D. J., I. Munn, J. C. Jones, and S. Grado. 1998. A survey to determine fee hunting and wildlife management activities by private landowners in Mississippi. Proc. Southeast. Assoc. Fish and Wildl. Agencies 52: In press.

Jones, J. C., and C. H. Bucciantini. 1998. Integrated natural resource management plan for Camp Shelby, Mississippi, Draft Rep. Dep. Wildlf. and Fish., Miss. State Univ., Miss. State. 106pp.

————, H. A. Jacobson, and D. H. Arner. 1997. Plant community characteristics in an 18-year-old white-tailed deer exclosure in south Mississippi. Proc. Southeast. Assoc. Fish and Wildl. Agencies. 52:250–258.

Kellert, S. R., 1978. Attitudes and characteristics of hunters and antihunters. Trans. N. Am. Wildl. and Nat. Resour. Conf. 43:412–423.

Minnis, D. L. 1997. The opposition to hunting: a typology of beliefs. N. Am. Wildl. and Nat. Resourc. Conf. 62:346–360.

Peyton, R. B. 1987. Mechanisms affecting public acceptance of resource management policies and strategies. Can. J. Fish. Aquat. Sci. 44:306–312.

U.S. Fish and Wildlife Service. 1997. 1996 National survey of fishing, hunting, and wildlife associated recreation. U.S. Dep. Int. Washington, D.C. 167pp.