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Kenneth J. Oswald

Northern Kentucky University, oswaldk2@nku.edu

Ernest Smith

Northern Kentucky University, smithe11@nku.edu

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A Role for Honors in Conservation and Biodiversity Education

KENNETH J. OSWALD AND ERNEST SMITH

NORTHERN KENTUCKY UNIVERSITY

INTRODUCTION

The earth's biota is in the middle of its most severe rate of decline since the end of the Cretaceous, the period that encompassed the extinction of the dinosaurs roughly sixty-five million years ago (Glavine). Numerous anthropogenic practices have contributed significantly to these losses in biodiversity (Eldredge; Novacek and Cleland). For instance, habitat reductions as a result of expanding human land use (Franklin; Sala et al.; Harte; Falcucci et al.), environmental degradation due to pollution (Barker and Tingey; McNeely), introduction and establishment of non-native species (Wilcove et al.; Sala et al.), and climate change (Lovejoy and Hannah) are among the factors known to have contributed to declines in biodiversity. Alarming, results of at least one survey have revealed that the American public does not rank this biodiversity crisis highly (Novacek) despite the many negative consequences associated with significant reductions in biodiversity (Chapin et al.; Worm et al.).

Several methodologies have been proposed to mitigate, halt, or even reverse losses in biodiversity (Johns; Novacek). Of these, education that conveys the importance of biodiversity to human subsistence is one particularly effective approach (Caro et al.; Braus; Bonine et al.; Brewer; Jacobson et al.). At the post-secondary level, biodiversity education is primarily the responsibility of a few closely-related scientific departments such as biology, natural resources, ecology, and environmental sciences. This restricted focus is not unexpected since biodiversity is a discipline that falls squarely under the purview of the natural sciences (see Takacs, 1996). However, in addition to its deep biological roots, biodiversity routinely traverses legal (Keiter; Glowka), political (Thomas; Boardman), economic (Chopra; Swanson; Johnson et al.), ethical (Tilman; Clark), and social (Takacs; Peine) arenas. Thus, comprehensive studies in biodiversity and its conservation require at least a cursory understanding of several highly varied academic disciplines

(Van Dyke). Such a holistic presentation of diverse academic disciplines may present a significant challenge to individual instructors, many of whom have spent their careers acquiring expertise in a single, narrowly focused field of study.

The multifaceted nature of biodiversity and conservation lends itself nicely to honors programs. Among other goals, honors seeks to provide for its students a multidisciplinary educational experience that furthers the core mission of a program. For example, at Northern Kentucky University, our honors program emphasizes four central domains: 1) active learning 2) global citizenship, 3) civic engagement, and 4) undergraduate research. We will demonstrate the ease with which biodiversity and conservation education can align with these four domains and with the multidisciplinary and values-based mission of honors. While we use the NKU Honors Program as an example, we hope that readers readily and easily extend this example to their own honors programs, departments, or colleges. We attempt to highlight how the myriad of academic expertise typically housed within honors programs readily promotes and addresses biodiversity and conservation education.

FOUR DOMAINS OF HONORS SCHOLARSHIP

DOMAIN 1: ACTIVE LEARNING

Partly due to the appeal of understanding biodiversity through diverse lines of study, it has been our experience that students readily participate in lively classroom debates and discussions concerning the many disciplines spanned by issues of biodiversity and conservation. Specifically, students engage their fellow classmates and instructor when asked to contextualize and couch conservation and biodiversity within their own major field of study, fueling active learning and promoting student interest. For example, finance majors may explore the economic values underlying the preservation of biodiversity while a political science student may investigate the policies that underlie effective management of imperiled species whose distributions span multiple boundaries between, for instance, states and nations. A criminal justice student may research and critique the various local, state, or federal laws that govern the illegal trade of endangered species. A psychology major, armed with knowledge of behavioral principles, may devise strategies to promote conservationist behaviors such as recycling and use of environment-friendly products. Collectively, these examples highlight the ease with which issues of biodiversity extend into major concentrations of study. Moreover, asking students to share their unique perspectives during class meetings not only conveys but also teaches the multidisciplinary of biodiversity to the entire class. In short, the wide variety of topics and disciplines

abuted by conservation and biodiversity offers the opportunity to engage a highly varied student population by spanning their diverse interests, thus spurring active learning.

DOMAIN 2: GLOBAL CITIZENSHIP

The current biodiversity crisis is a global problem (Goudie). Indeed, hotspots of biodiversity have been identified on every continent (Reid; Myers et al.), save Antarctica (Myers et al.; Brooks et al.). Therefore, students of biodiversity must place themselves within the setting of any given society in order to fully understand and appreciate the complexity of its systems. For example, when asked to formulate effective biological recovery strategies for individual species or to design and strategically place wildlife reserves, students must understand and account for the political, economic, social, geographic, and theological structures of the region in question.

International travel, a hallmark of numerous honors programs, is an excellent mechanism by which students pursue global citizenry. Students are well served by travelling to the numerous imperiled ecosystems of the world to investigate first-hand the current state of the biodiversity crisis in a region of personal interest. Once on site, students are free to immerse themselves in the ongoing mitigation and remediation efforts specific to these locales. Such a proactive, *in situ* approach to the study of conservation and biodiversity offers honors students a rich educational experience while driving measurable actions dedicated to the preservation of species. One such trip undertaken by our honors faculty involves collaboration with the biology department at Northern Kentucky University. This trip exposes students to highly diverse montane and rainforest biotas, the various threats each faces, and on-going recovery efforts specific to each environ. Further, the trip is not restricted to students majoring in the natural sciences but is available to all honors students interested in global biodiversity and conservation. Students majoring in political science, anthropology, biology, Spanish, nursing, English, chemistry, and philosophy are registered for this year's trip, and each will be encouraged to observe and study the interaction between biodiversity and his or her respective field of study.

DOMAIN 3: CIVIC ENGAGEMENT

Students in honors biodiversity classes typically have several mechanisms at their disposal to serve the public good. Opportunities abound to assist in, or even initiate, efforts dedicated to the preservation of biodiversity at local, regional, national, and international levels. Such opportunities are especially accessible to university students, for whom numerous internship programs have been established that provide hands-on experiences dedicated

to the preservation of biodiversity. Similarly, student involvement in conservation policy can be accomplished via a variety of mechanisms, one of which is particularly adaptable to an entire class.

The following model illustrates how civic engagement can be incorporated into an honors class. In a section of Honors 101: Endangered Species and Conservation, students were asked to query a political representative of their choice about their views on biodiversity and conservation. Importantly, no constraints were placed on the pool of politicians from which the students could choose; contact of any representative at the local, state, or federal levels was permitted. Students could communicate with targeted representatives by postal mail, electronic mail, phone, or personal interview. The array of responses the students received was often eye-opening, ranging from complete ignorance about biodiversity to cogent, well-constructed opinions that were relevant to governmental intervention in management of imperiled species. An argument could be made that students gleaned the most information from those representatives who chose not to respond at all. Most importantly, whether or not a student obtained a response and regardless of the answer, the exercise proved educational by alerting students to the extreme variation in elected officials' viewpoints on biodiversity. The exercise culminated with critical readings of each response in class, followed by group discussion. Finally, students received a strong reminder that the responses they obtained came from the people entrusted with governance of the nation's biodiversity.

DOMAIN 4: UNDERGRADUATE RESEARCH

The culmination of many honors programs is an in-depth research experience that often takes the form of a thesis or capstone project. Studies in biodiversity and conservation lend themselves particularly well to this culminating experience. Biodiversity research is also well-suited to academic collaboration as research projects typically span multiple disciplines. In addition, most research projects achieve one or more of the three goals discussed above, thus streamlining an honors student's education; for example, students who choose to call on the expertise of a natural resource agency (either domestic or foreign) for their thesis or capstone fulfill both research and civic engagement components simultaneously. Further, biodiversity research and conservation efforts vary widely in scope so that projects are available that can be easily defined by the student researcher. Finally, patterns and trends in biodiversity are easily accessible topics that undergraduate student can study at the campus, local, regional, national, and international scales. Thus, students have the freedom to design projects independently within multiple constraints such as time, budget, and program-specific educational requirements.

Our experience is that students respond most positively when asked to research an aspect of biodiversity and conservation that is relevant to their particular scholarly interests. One student at Northern Kentucky University, for instance, is undertaking a capstone research project on the current status and conservation genetics of an extremely rare and regionally endangered freshwater fish. The student has aggressively pursued this project, partnering with multiple state-level conservation agencies. These partnerships have not only effectively leveraged state wildlife agency resources (ones that may not be available at the university) but will also entail free dissemination of study results to the fishery scientists and governmental officials charged with species oversight and management. This student is an elementary education major, and a third component of the capstone project involves formulation of scientific lesson plans aimed at teaching biodiversity to schoolchildren in the primary grades.

SUMMARY

Since honors faculty typically represent varied academic disciplines, collaboration among faculty within an honors program can be both complementary and synergistic, providing comprehensive conservation and biodiversity education to a cross-section of the total student population. The need for such education is urgent as the future will undoubtedly bring increased challenges for the preservation of biodiversity. Human demand for natural resources is expected to increase concomitantly with forecasted upward trends in human population growth, and these future pressures on natural resources will likely, in turn, exacerbate extinction levels (Jenkins). All university students, not just those majoring in the natural sciences, should be educated on the numerous values inherent in the preservation of biodiversity. Honors programs are aptly suited to reach segments of the student population majoring outside the natural sciences who might otherwise never gain exposure to this critically important topic.

Finally, we are not advocating that honors programs assume primary responsibilities for educating university students in issues of biodiversity, nor are we suggesting that honors programs take on the responsibility for formal training of future conservation biologists and natural resource managers. To be sure, these duties are best left to the expertise of the highly trained faculty within the natural sciences. Honors programs are, however, charged with producing highly educated and socially responsible citizens, especially with regard to issues that present pressing and immediate concerns for the health and sustainability of human populations. By their very nature, honors programs are well-positioned to deliver this message to the large portion of the student population that otherwise might never gain exposure to science-based

topics. The current rate of biodiversity loss necessitates action now, and by providing students with a broad education that offers courses in biodiversity and conservation, honors programs can increase students' awareness and understanding of the scope and immediacy of the current crisis while meeting multiple goals of the honors mission.

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The authors may be contacted at
oswaldk2@nku.edu.