

# **The Status of Undergraduate Education in Conservation Biology**

Sponsored by the Education Committee of the Society for Conservation Biology

Report prepared by

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## **Introduction**

Since its inception in the mid 1980's, the Society for Conservation Biology (SCB) has been dedicated "to help develop the scientific and technical means for the protection, maintenance, and restoration of life on this planet." SCB has identified six specific areas where it should target its time and energy; one of these six areas is "education at all levels, preparatory and continuing, of the public, of biologists and of managers in the principles of conservation biology." In a recent issue of the SCB Newsletter, President Reed Noss (1999) identified four specific areas of reform to work toward in the years to come. Among these included: "Reforming the education of conservation biologists at undergraduate and graduate levels, especially to prepare students better for careers outside of academia". However, before we can attempt to forge a new approach to conservation education, strengths and weaknesses in the current education system must be identified. Although there have been occasional spotlights on undergraduate education in conservation biology (Jacobson and Hardesty 1988, Fleischner 1990, Trombulak 1993), there has been no common understanding of what is being taught in conservation biology at the undergraduate level. To gather baseline data on the current status of undergraduate education in conservation biology, the Education Committee of SCB sponsored a survey of its membership. The survey was published in the February 2000 issue of the Society for Conservation Biology Newsletter, which is distributed only to members. The survey consisted of 15 questions concerning courses and/or programs in conservation biology-- how they are structured, what they consist of, their effectiveness, and how SCB might help.

## **Results**

The survey was distributed to over 5,000 members of the SCB in its quarterly newsletter. Forty-five surveys were returned--44 from the United States and one from Brazil. A diversity of institutions--ranging from small liberal arts colleges to large research universities, and including one tribal government and one high school--were represented (see Appendix). Only one institution was represented by more than one respondent. The survey was completed by faculty (77%), graduate students (14%), undergraduate students (7%), and others (2%). Of the schools represented, 84% taught at least one course in conservation biology, 77% of which required one or more prerequisites. Within those schools with a conservation biology course, 9% had a degree in conservation biology and 11% had a major with a concentration or emphasis in

conservation biology. Forty-five percent of schools listed a field component in their conservation biology curricula. When asked if students do internships, 52% of the respondents said yes, and 27% had it as an option with occasional participation. When asked if students who emphasize conservation biology in their major or minor get practical experience in problem solving, 45% said yes, and 25% listed some (Table 1).

Table 1. The general nature of conservation biology courses and curricula at different institutions.

<b>Question</b>	<b>No</b>	<b>Yes</b>	<b>Not applicable</b>	<b>Other</b>
Does your institution teach one or more courses in conservation biology?	7 (16%)	37 (84%)	---	---
Are there prerequisites?	4 (9%)	34 (77%)	5 (11%)	1 – no answer
Is there a field component?	15 (34%)	20 (45%)	6 (14%)	3 – Yes, but limited (7%)
Is there a degree track in conservation biology?	32 (73%)	4 (9%)	3 (7%)	5 – We offer a “concentration” (11%)
Is there interaction and cooperation between disciplines and departments?	5 (11%)	25 (57%)	12 (27%)	2 – Some cooperation (5%)

The concepts taught, as well as the skills focused on, in conservation biology courses varied between institutions (Tables 2 and 3). While 92% of schools included island biogeography, only 54% included ecosystem management, and only 43% listed gap analysis. When asked what skills were taught in the course, 84% of the same schools listed written communication, 54% listed oral communication, 51% listed quantitative assessment/data analysis, 41% listed real world experience in policy or government, 32% listed field natural history, and 16% listed other. The survey also asked what other courses have conservation as a prominent subject. Sixteen per cent listed ecology, 16% listed vertebrate zoology, 14% listed environmental studies and 49 other courses were mentioned in less than 10% of the surveys.

Table 2. Concepts taught in conservation biology courses at different institutions.

<b>Concept</b>	<b>Schools That Teach This Concept</b>
Island biogeography theory	92%
Design of nature reserves	89%
Historical background in conservation	76%
Populations genetics	73%
Integration of course concepts with local issues	70%
Values and ethics	70%
Political process and policy	59%
Restoration ecology	54%
Ecosystem management	54%
Gap analysis	43%
Other	30%

Table 3. Skills developed in conservation biology courses at different institutions.

<b>Skill</b>	<b>Schools That Teach This Skill</b>
Written communication	84%
Oral communication	54%
Quantitative assessment and data analysis	51%
Real world experience in policy or government	41%
Field natural history	32%
Other	16%

When asked if their institution was actively implementing the values of conservation biology, 18% of respondents replied that they have campus recycling programs and 16% said they managed campus owned land for habitat or organic farming. On the other hand, 36% of schools have no active policies towards conservation within the institution. Ideas varied as to how conservation biology education could be enhanced at respondents' institutions. Two main responses were, the need to incorporate a field component to the curricula (30%), and the need for more committed and knowledgeable staff (18%). When asked about the obstacles to the creation and expansion of conservation education at the undergraduate level, 30% listed no obstacles, 9% listed not enough time, 11% listed the need for a new course or faculty, and 11% listed conservation biology not seen as a "hard" science, yet too technical for a liberal arts school. When asked what SCB could do to help conservation biology education, 11% mentioned the need for an example of what should be included in an undergraduate course curriculum in conservation biology. Eleven percent mentioned the need for support of local student chapters. Eighteen percent mentioned the importance of creating a web page to exchange information. The

web page could include: job and internship opportunities for students (both summer and year round), global conservation projects so students can learn more about the implementation of conservation biology, and a list of undergraduate programs in conservation biology.

### **Discussion**

The results of this survey can serve as a useful starting point for developing a more coherent approach to undergraduate education in conservation biology. Nevertheless, these results should be interpreted with some caution. With only one exception, all respondents represented institutions in the United States. While perspectives from 44 institutions cannot provide a comprehensive view, they do represent a diversity of institutions: from large research universities to small liberal arts colleges, and from most geographic regions of the United States. One of the most obvious trends to emerge from this survey concerns field study. Less than half of the schools had a field component in their curricula and only 32% taught field natural history. When asked how conservation biology curricula could be enhanced, 30% related a need for a field component. This result accords with concerns expressed by many authors that the demise of natural history may be undermining the future of conservation biology in particular (Noss 1996), and, more broadly, land management (Trombulak and Klyza 2000) and our culture in general (Fleischner 1999).

### **Literature Cited**

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Jacobson, S., and J.L. Hardesty. 1988. The fourth objective. *Conservation Biology* 2: 221

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Noss, R. 1999. Dreams of a millennial president. *Society for Conservation Biology Newsletter*. 6: 7-8.

Trombulak, S.C. 1993. Undergraduate education and the next generation of conservation biologists. *Conservation Biology* 8: 589-591.

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## Appendix.

Institutions represented in results of Society for Conservation Biology survey on undergraduate education.

1. Arizona State University
2. Bethel College
3. Brigham Young University
4. California State University, Fullerton
5. Colorado College
6. Cornell College
7. Furman University
8. Gettysburg College
9. Gustavus Adolphus College
10. Hamilton College
11. Jacksonville University
12. Lees-McRae College
13. Loyola University (New Orleans)
14. Miami University
15. Michigan Technological University
16. Middlebury College
17. Millsaps College
18. Morehead State University
19. Nez Perce Tribe
20. North Carolina State University
21. Ohio University
22. Paul Smith's College
23. Prescott College
24. Princeton University
25. Saint Andrews School
26. San Diego State University
27. San Jose State University
28. SUNY- Albany
29. SUNY, Syracuse
30. Texas Tech University
31. Universidade Estadual de Campinas (Brazil)
32. University of California, Berkeley
33. University of California, Santa Cruz Extension (Sierra Institute)
34. University of Chicago
35. University of Colorado, Boulder
36. University of Idaho
37. University of Maine
38. University of Minnesota-Morris
39. University of Mississippi
40. University of Tennessee
41. University of Vermont
42. University of Wisconsin - Eau Claire

43. Warren Wilson College
44. William Paterson University