Conservation Biology Graduate Program:
Student Learning Outcomes and Evaluation

March 2015

Program Background

The Conservation Biology Graduate Program at the University of Minnesota was established as one of several major interdisciplinary programs recognized by The Graduate School in 1990. It was one of the first graduate programs in this discipline in the country and has grown to be one of the strongest, most comprehensive and longest-lived programs in conservation biology globally. It is unique because it has a long history of participation by faculty from a diversity of academic programs and expertise in the biological, physical and social sciences. Although initially housed as an interdisciplinary program within The Graduate School, the Conservation Biology Graduate Program is now administered through the College of Food, Agricultural and Natural Resource Sciences (CFANS).

The vision of the University of Minnesota Conservation Biology Graduate Program is to educate leaders in the field of Conservation Biology. Graduates will acquire foundational skills and knowledge and contribute new knowledge that will inform conservation practices. Because conservation biology problems are inherently interdisciplinary, with solutions that require integration of natural and social sciences, the Program includes faculty and students from across the University, as well as external partners, who are engaged in conservation-related research, outreach and teaching.

The CB program offers MS, PhD and Joint J.D. degrees, and a minor, along with a fisheries and aquatic biology track. The Program’s ~60 students represent a diversity of educational backgrounds, career goals and geographic origins. We strive to recruit the most highly qualified and motivated graduate students and our graduates are employed in public, private and non-profit sectors. Most Conservation Biology graduates become leaders in academia, public land and natural resource management or in conservation focused non-profit organizations.

Process for Developing this Statement:

This statement was developed in consultation with faculty with appointments in the Conservation Biology Graduate Program and students enrolled in the Conservation Biology Graduate Program (CB). The Program’s goals and outcomes for students, and how to assess them, were discussed in a meeting of the Conservation Biology Program Steering Committee (Fall 2014), a Conservation Biology Program faculty meeting (Spring 2015) and in an open meeting with the graduate students (Spring 2015). Based on these discussions, a draft statement was written and revised using feedback from some of the faculty and graduate students.

Student Learning Outcomes and Methods for Assessment of Achievement
Conservation Biology Graduate Program faculty and students identified a number of student learning outcomes. Because students pursuing a MS degree are not expected to achieve the same depth and breadth of subject matter expertise as doctoral students, we focus here on expectations for doctoral students only. Following each student learning outcome is a statement (in italics) identifying how the Conservation Biology Graduate Program assures that a specific outcome is achieved.

1. Acquire a sound background in the biological sciences relevant to the conservation of plants, animals and ecosystems on a global basis.

   All students in the Program are required to enroll in FW 8452 which focuses on primary examples of conservation from local to global scales. Additionally, they are expected to enter the program with competency in the biological sciences or to gain competency through additional coursework relevant to their research interests. Additional background is gained through required attendance at 3 semesters of seminars (CBio 8001) which focus on emerging topics in the field of Conservation Biology. Finally, student advisory committees ensure students have appropriate coursework backgrounds. Successful completion of these courses and program requirements serves as documentation that this outcome has been met.

2. Acquire knowledge of the social, political and economic sciences that relate to both the recognition and solution of conservation problems on a global basis.

   Students are required to enroll in the core-course, CBio 8004, Economic and Social Dimensions of Conservation Biology, which focuses on the social aspects of our field from local to global scales. Additional background is gained through required attendance at 3 semesters of seminars (CBio 8001) which focus on emerging topics in the field of Conservation Biology, including social issues. Finally, student advisory committees ensure students have appropriate coursework backgrounds. Successful completion of these courses and program requirements serves as documentation that this outcome has been met.

3. Understand the causes of conservation problems and be well prepared to develop sound solutions or approaches to these problems that are likely to be acted upon or implemented.

   Students acquire competency for this learning outcome through a diversity of requirements and elective activities. For example, they learn about conservation problems and how to develop solutions in the two core courses (FW 8452; CBio 8004), through elective courses, while attending seminars (CB 8001), during interactions with faculty and students, at professional conferences and while preparing for their written and oral preliminary exams. Additionally, an important component of our program is engagement with individuals employed in public, private and non-profit agencies/organizations who have experience working on solutions to conservation problems. Many such individuals hold adjunct positions in our program and interact with students as advisors, instructors or temporary employers. Examples of employment for program contributors...
whose work is applied and solutions-focused include: Center for International Food and Agricultural Policy; Forestry for Sustainable Development; Center for Natural Resource Policy and Management; Minnesota Zoo; The Nature Conservancy; Minnesota Department of Natural Resources; U.S. Fish and Wildlife Service; USGS Biological Resources Division. Successful completion of the courses and reporting of other activities serves as documentation that this outcome has been met.

4. Acquire specialized knowledge of a body of literature, including the ability to identify new research opportunities in the field.

This learning outcome is accomplished through the Program's creative written exam process and also while students pursue their own research topic. The written preliminary examination, required for PhD students, is a two-step process. Each year, all students desiring to take the exam identify themselves to the Prelim Committee and participate in a process to select a topic for study during the next semester. Students enroll in CBio 8095 and produce a group paper. Members of the prelim committee review the paper and write questions for the written preliminary examination based on the concepts covered in the paper. The written preliminary examination is an individual exam that is taken in one day. The preliminary exam topic typically has little connection to student dissertation topics, thus ensuring that it exposes students to broad research opportunities. Successful completion of this program requirement serves as documentation that this outcome has been met.

5. Acquire proficiency in designing and executing research to answer significant questions that have real world applications.

PhD students are required to conduct research as a part of their dissertation on conservation biology issues under a faculty advisor. Students have access to over 100 CB faculty members carrying out research on a wide variety of cutting-edge research on conservation biology issues. This outcome is evaluated by successful defense of their research work and publication of results in peer-reviewed journals. Students are required to enroll in a minimum of one quantitative methods course, such as statistics or geographic information systems. They are encouraged to take additional courses as well, depending on their research focus. Successful completion of these courses and program requirements serves as documentation that this outcome has been met.

6. Develop the ability to effectively communicate both orally and in writing.

PhD students are required to present orally in the weekly seminar (CBio 8001) at least twice before graduation. Additionally, students are strongly encouraged to attend national conferences to present on their research and most students do so. The Program raises funds to partially support students participating in such conferences. Written skills of students are developed through the process of dissertation writing, but prior to that time, students are required to develop a proposal in FW 8452 and submit their own research grants to funding sources outside the Program.
Successful completion of these program requirements serves as documentation that this outcome has been met.

7. Demonstrate a commitment to service in the discipline, including engagement in the profession and society at large.

Our program expects and documents active participation in a variety of activities that involve service to our program, to the field of conservation biology, to the University, and to society. These activities vary a great deal among our students. Program activities include leadership in seminar development and participation in program governance and fund raising (including our “Bike across Minnesota”, “Conservation Biology Research Spotlight Fundraiser” programs), serving as student members on the Conservation Biology Program Advisory Committee, organizing our seminar series, and serving as organizers for prospective student Welcome Weekend. Service to the field includes serving as officers of the Minnesota State Chapter of the Society for Conservation Biology, participating in national societies (as committee member or speaker at conferences) and serving as reviewers for journals. Service to the University includes committee service on Council of Graduate Student, representatives to Department of Fisheries, Wildlife and Conservation Biology voting staff meetings. Service to society includes a variety of education and outreach activities (speaking to many audiences, interviewing K-12 students, and giving workshops). Commitment to active community participation is measured and documented through the annual review process. Students with high levels of community service may be awarded “Outstanding CB Student Award”; several have received leadership awards at the University level.

8. Develop commitment to the ethical conduct of research and professional activities.

The core introductory courses, FW 8452 and CBio 8004 include modules on ethics within the discipline. Participation in these sessions serves as documentation that this outcome has been met.

Review of Student Learning Outcomes

Through the student annual review, required by The Graduate School, graduate education reports and periodic alumni surveys, the CB program generates metrics that allow us to track and evaluate our goals and student achievements. The following data are collected from students:

- Milestones for student degree progress
- Participation in professional meeting to present papers and posters based on their research
- Publications in peer-reviewed journals and other outlets
- Effort to write grant proposals based on number of proposal submitted and number of grants funded
- Participation in conservation related outreach programs
- Awards received by students (e.g. fellowships, assistantships, professional awards)
- Student time to graduation
- Job placements
The program communicates a summary of annual review results to students at the first seminar of the fall semester. The program recognizes student effort by honoring one student each from the MS and PhD programs to receive the “Outstanding CB Grad Student Award” for a particular year. The program also submits a summary of annual review data to CFANS administrators.

The DGS and members of different committees update program and student progress and issues to the steering committee every semester to seek their guidance. Major issues and annual progress are discussed and evaluated at the general faculty meeting.