

**DEPARTMENT OF ZOOLOGY
ASSESSMENT REPORT 2004-2005**

A. Undergraduate Assessment by Degree/Certificate Program

1. List in detail your Student Learning Outcomes (SLOs) for each undergraduate degree/certificate offered.

Bachelor of Arts in Zoology:

- Acquisition of a broad liberal arts education and knowledge of various fields in zoology (e.g., cell and molecular biology, ecology, evolution)
- Mastery of basic principles, techniques and historical development of various zoological subdisciplines

The BA degree prepares students for professional schools in biomedical science (human and veterinary medicine, dentistry, physical therapy, etc.)

Bachelor of Science in Zoology:

- Acquisition of a foundation and broad background in the principles and the diverse ways of thinking in zoology
- Mastery of the principles, techniques and historical development of several specific areas chosen by the student (e.g., evolution, ecology, physiology)
- Acquisition of research experience through the design, implementation and completion of an independent research project under a faculty member's direction

The BS degree prepares students for graduate study in life sciences or immediate employment in zoology-related research or applications.

2. Where are these SLOs published (e.g., department web page)?

They are in our undergraduate brochure, the catalog and on our website.

<http://www.hawaii.edu/zoology/index.html>

3. Explain how your SLOs map onto your curriculum, i.e., how does your curriculum produce the specific SLOs in your students?

For the bachelor's degrees students complete general education requirements first, then a suite of related, required courses, including calculus, general, organic and bio-chemistry, and for the BS degree, additional courses in calculus and organic chemistry, genetics and physics. Depending on career goals and degree program, students may design a curriculum that focuses on areas they have a particular interest in. The Department excels in the fields of marine biology, ecology, evolution, conservation biology and developmental biology. BS students are required and BA students are encouraged to complete an independent research project under the direction of a faculty member and both BS and BA students must complete one semester as a teaching intern in an approved laboratory course.

4. What specific methodologies were used to collect data? In developing your

response, consider the following questions:

We have not yet administered the paper/pencil assessment (see Appendix #1) designed specifically to collect the information required (by WASC). We intend to begin gathering data this year in our senior seminar course, Zoology 490, which we may develop as a capstone course. We had hoped to use email surveys, but have found that the response rate is so low as to be useless.

Other data we have collected to date focus on where our graduates have gone and what careers, positions, etc. they have held or currently hold (see Appendix #2). These data was gathered by asking faculty, staff, fellow students, etc. to follow up with students they advised or students who keep in touch with them.

Each faculty member constantly assesses his or her own classes, and making changes in content, assignments and evaluation accordingly. We do not formally track such changes to all of our courses; the effort requires to do this would seriously compromise the faculty's ability to carry out their primary tasks of teaching, research and service.

Last spring we attempted to contact our majors to ask for their input of the effectiveness of our approach to advising and to offer help with finding advisors, group advising, etc. An email was sent to about 160 majors (see immediately below). Ten responded.

- **What was the nature of the instruments or methods used? e.g., “Paper/pencil” survey; essay/writings; recording (video, audio); Capstone class, course, or project;**

To: Zoology Undergraduate Major

The Zoology Department request for your assistance in providing the following information to assist during the advising period:

1. Who do you see for advising in the Zoology Department?
2. What is your major area of specialization shown below?
 - a) Marine Biology
 - b) Cellular, Molecular Biology (Developmental Biol)
 - c) Ecology, Evolution, Conservation Biology
 - d) None of the above at this time
3. What is your estimated semester/year to graduate in Zoology?

Please reply with the above requested information no later than April 15th, and include your first and last name. Your assistance and cooperation is greatly appreciated.

- **What was the nature of the data obtained in your assessment? There are a variety of forms of data you might get from or about your students, including:**

- **Perceptual/attitudinal indicators that tell us about students' perceptions of the program/department; their experience in the program/department;**

their attitude toward the program/department; their attitude toward the faculty;

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The data we got falls into this category, but also provided basic information about the ten responders.

- **Performance indicators that tell us something about the level of competence with skills or content those students attained as a result of going through your program.**

The grades students earn from faculty are a good indication of the student's level of competence in a the subject material covered in the individual courses. However, grades do not tell us about how effective our program is as a whole, and it is this area we hope to develop assessment tools.

- **When were the data collected? e.g., end of semester; multiple points in semester (for time-based comparisons);**

The data mentioned above were collected in spring 2005.

- **What *population(s)* is covered by your assessment(s)?**

All zoology majors with senior standing (~30)

- **This question helps us identify what student group you are trying to make statements about. For instance, are you attempting to ask questions about a) only majors in your department; b) both majors and minors; c) “service” students (those students taking your classes to satisfy requirements imposed from outside your program – general education needs, gate keeping or entry classes required for other colleges, departments, programs, etc.); or d) general student population taking your classes as electives.**

All zoology majors, including BA and BS with senior standing; Zoology has almost no minors.

- **Who were your actual subjects and *how* were they used in the assessment?**
- **This question tells us who you actually collected data from and how the data from these students helped you answer questions about your program. For example, did you randomly select students to participate? Did you collect data from pre-existing classes? Were they assigned to single groups; did you compare across multiple groups (e.g., cross sectional comparisons across incoming freshman; transfer students; graduating seniors);**

The subjects were ten students who took the time to respond. In future our subjects will be those seniors taking our required senior seminar course (Zoology 490).

- **What is the size of your assessment sample relative to the possible student population you are drawing from (e.g., you sampled 30 majors out of a**

population of 100 majors)?

As mentioned above, we sent the survey to about 30 senior Zoology majors.

- **How many students were actually sampled? The whole population? A subset of the population?**

See previous answers.

- **How many students provided data vs. how many were solicited for data (i.e., What was your response rate?). For example, you might have asked 20 graduating seniors to complete a survey but only 12 did so.**

See previous answers. Response rate was ~30%.

- **Who examined or assessed the data? e.g., were raters/assessors/coders/graders used? Were the raters graduate students (if so, how many were used? Was reliability established?); Were the raters faculty members? (if so, how many were used? Was reliability established?); Were ratings provided by internship supervisors?**

Data were assessed by the director of undergraduate studies and the department chair.

- **Where were the data collected? e.g., in class settings; scheduled outside of class; off campus.**

See previous answers.

5. How were the assessment data/results used to inform decisions concerning the curriculum and administration of the program?

- **Was pedagogy changed?**

Not as a result of the above survey. However, it is essential to point out that each faculty member is constantly evaluating his/her own courses by asking students for input, testing students, reading student evaluations, attending CTE teaching workshops, discussing teaching with colleagues, etc. How each faculty member changes each course is not something we formally track in detail. However, we do retain a fairly comprehensive file of course syllabi that provide a history of changes made to the various courses.

- **Did you make administrative changes?**

Yes. We have changed how advisors are assigned to students. In addition, we will be trying to reach newly declared majors as soon as they have filed their declaration so that we can provide advising right away.

- **Were there changes in interactions with students? Advising, counseling, etc?**

Yes. Our principle findings were that the lack of response to the survey and extremely poor attendance at the advising meetings (see below) indicated that the students are not motivated to seek help with advising. Responses to our survey indicated that students were having difficulty finding advisors. Responses also indicated that students had not read information on the website, in the catalog or in the undergraduate brochure (offered to all students who come to the office, and by most faculty advisors during appointments) that would have helped them with their problems. One student commented that the office staff could not help them.

In other words, the vast majority of our majors are not motivated to see help or advice, and we can't force it on them. The director of undergraduate studies held two meetings (all majors were notified by email) to help with advising by identifying advisors for individual students and answering general questions. One meeting was attended by two students, the other by none. We plan to undertake staff training so that they can be more helpful to students.

– **Were degree requirements changed?**

We make changes in degree requirements from time to time by adding additional options for fulfilling specific course requirements. For example we recently added another biochemistry course (several are available on campus) to those that can fulfill that requirement.

– **Were courses changed?**

See above answer regarding changes in pedagogy.

6. General Education Assessment Within the Major:

Manoa's General Education Program includes the following requirements of majors. All students who graduate with the major:

- 1) are proficient in the primary information-accessing and information-processing methods of the field; by either integrating such skills within courses or research projects or by recommending an appropriate course offered in another department (computer/info sciences, etc.);**
- 2) are proficient in the problem-solving and oral communication methods of the field;**
- 3) have had training and experience in the modes of inquiry and analysis appropriate to the field. The purpose is to have all students actively engaged in scholarship at a high level, and to avoid having students completing their degrees by means of passive learning alone.**

How have you met the above requirements in your degree program?

Yes, our senior seminar, Zoology 490, requires students to find and read papers or books on specific topics, to write evaluations of those publications and to participate in, including leading discussion, in critiquing the papers/publications.

In addition, all Zoology BS majors are required to take 4 credits of Zoology 499. The work expected for these credits is the design, implementation, and completion (including a write-up) of an independent research project under the direction of a faculty member. BA majors are encouraged, but not required, to do the same.

Zoology offers a number of writing-intensive courses, usually laboratory courses in which the enrollment is small.

Finally, all majors are required to serve one semester as teaching interns in an approved laboratory. This experience involves oral communication skills, information processing (we should probably use the fashionable phrase here and say “critical thinking”), and problem solving, as well as mastery of content and techniques.

B. Graduate Assessment by Degree/Certificate Program

1. List in detail your Student Learning Outcomes (SLOs) for each graduate degree/certificate offered.

The Zoology graduate program offers three degrees: a thesis M.S. (Plan A), a more coursework-oriented non-thesis M.S. (Plan B) and the Ph.D. The thesis M.S. and the Ph.D. are research-oriented degrees, intended primarily for students who desire a career involving research. The non-thesis M.S. requires less research experience than does the thesis M.S. and so is appropriate for students planning non-research careers, such as teaching or government service, as well as those planning research careers.

Our SLO's for these degrees are:

Proposal, development, implementation and completion (often publication) of one or more research projects. Most students choose their own topics and are assisted in their research by faculty advisors, fellow students and other colleagues. (MS, MA, PhD degrees)

Acquisition of advanced knowledge of theories, principles, techniques and literature in their chosen field of specialization (MS, MA, PhD).

Acquisition and practice of oral and written communications skills associated with teaching and research presentations. Ph.D. students are required to teach at least one semester.

PhD students are expected to have a broad knowledge of the field of Zoology, including history, theoretical constructs, and content, and to be able to read, analyze, speak and write about life sciences.

2. Where are these SLOs published (e.g., departmental web page)?

They are in our graduate program brochure, our graduate student handbook, the catalog and on our website. <http://www.hawaii.edu/zoology/index.html>

3. Explain how your SLOs map onto your curriculum, i.e., how does your

program of graduate studies produce the specific SLOs in your students?

To assess each incoming student's level of competence in three major areas (Cell and Molecular Biology, Organismic Biology [e.g., physiology, development] and Supra-organismic Biology [e.g., ecology, evolution]) each student who does not score 90% or higher in these areas on the Biology GRE is required to take a diagnostic examination. The exams also indicate the students' level of ability to organize coherent answers and to write in good English. Most students take diagnostic examinations in each of the aforementioned areas to assess their knowledge/competence. These exams are written and graded by a Diagnostic Exam Committee that changes each year. That committee makes recommendations to rectify deficiencies to a Graduate Education Committee, which then decides what students will be required (usually specific coursework) to do to make up for the deficiencies.

Annual reports are required of each student. Appendix #2 shows the form we use and the information that we gather. These reports include lists of presentations, grants, awards and publications, as well as courses completed, committee meetings held, comprehensive exams successfully taken. Each student is required to meet annually with his/her advisor and /or committee to discuss progress.

Each year the Zoology Department holds a graduate symposium (the Tester Symposium) at which students present results of research. A distinguished speaker is invited to deliver research and public lectures, to meet with students and to judge student presentations. One faculty member and those graduate students who won awards for their presentation the previous year join the distinguished speaker on the judging panel.

All three zoology graduate degrees require a public presentation or "defense" of the students' research.

4. What population(s) is covered by your assessment(s)?

Some past graduates (our follow up on where our graduates are and what they are doing) and all current students.

5. Please list/describe all the assessment events and devices used to monitor graduate student progress through the program. Consider the following questions:

- **How are written exams used to assess graduate students?**

See answer to Question # 3.

- **How are independent and/or culminating projects (theses, dissertations, performances, capstone courses, etc.) used to assess graduate students?**

All graduate degrees require some kind of public presentation or defense. The floor is open for

questions after the presentations and when public questions have been answered, the student's committee remains to ask additional questions. In addition, each student is required to give some kind of public presentation (papers or posters at meetings, talks to public groups, research results presentations in seminars, etc.) once a year.

– How are oral presentations/reports/performances used to assess graduate students?

Questions from the floor give the student's committee, which is usually in attendance at most of the public presentations, an idea of how well the audience understood the presentation and how the quality of the data analysis and interpretation was perceived. If there are obvious problems these are discussed at a committee meeting immediately following the presentation. Most students have regular meetings with their advisors and fellow students, where they ask for input and suggestions on their research proposals, experimental design, data analysis, etc. These "lab meetings," as they are often called are less formal than an actual thesis or dissertation defense.

6. Please list/describe how your graduate students contribute to your discipline/academic area? Consider the following questions:

– To what extent do your graduate students present their work at professional conferences?

Extensively, and in most academic years at least three or four students win "Best Student Paper" awards at professional meetings. In his/her annual report, each student lists all presentations made during the academic year.

– To what extent do your graduate students publish their work?

Many, but not all, doctoral students publish at least one paper from their dissertation research. Some publish several papers before graduating, although this is rare. Master's students also publish results, but to a lesser extent. Virtually all student give oral or poster presentations at international, regional and local professional meetings in their areas of expertise.

7. What attempts are made to monitor student post-graduate professional activities?

See Appendix #3.

– In which industries/professions do your graduates find employment?

Primarily in applied science professions (including natural resource management, agriculture, government), research organizations and academic positions (including K-12, colleges, universities, museums, research institutes, etc.). See also Appendix #3.

– How successful are your graduates in their chosen professions and careers?

See Appendix #3.

8. How were the assessment data/results used to inform decisions concerning the curriculum and administration of the program?

– **Was pedagogy changed?**

Every faculty member is constantly evaluating his/her own courses by asking students for input, testing students, reading student evaluations, attending CTE teaching workshops, discussing teaching with colleagues, etc. How each faculty member changes each course is not something we formally track in detail. However, we do retain a fairly comprehensive file of course syllabi that provide a history of changes made to the various courses.

– **Did you make administrative changes?**

We are constantly evaluating and changing requirements for graduate degrees in response to student and faculty input. For example, last year, we did away with our foreign language requirement for the PhD and the year before that we did away with our requirement for the Subject (Biology) Test in the GRE as part of each student's application. This coming year we will be considering changes in the diagnostic exam and the procedures we use to evaluate applications to our program. We do not formally track these activities, except to record them in the minutes of meetings.

– **Were there changes in interactions with students? Advising, counseling, etc.**

The week before their first semester begins, all incoming graduate students are counseled by our Graduate Education Committee. The GIC goes over degree requirements, assigns some coursework, and briefly discusses the student's goals with him/her. During the first semester all incoming students are required to take a seminar during which they meet all of the graduate faculty in weekly sessions. Each faculty member briefly discusses his/her research and takes questions from students. The graduate students elect four representatives each year. These "gradreps" attend all faculty meetings, and most committees have a graduate student representative on them. Student committee members leave such meetings when confidential topics are discussed. The gradreps regularly poll the graduate student body about the program (what new courses are needed, are courses offered frequently enough, should degree requirements change, etc.), and provide input to faculty at the monthly faculty meetings. In addition, they participate in the recruitment process when we hire new faculty members, meeting with the candidates formally and informally, and expressing their preferences at the time of decision-making. We do not keep formal records of these kinds of activities.

– **Were degree requirements changed?**

Yes, see above.

– **Were courses changed?**

Courses are constantly being changed—see various answers above. Faculty members introduce new courses time to time. Occasionally courses are modified or dropped from the curriculum. The department has a number of graduate "topics" courses, which are taught by different faculty

and cover different topics in a variety of fields every semester. Topics courses include: development and reproductive biology, science teaching, biometry, nerve/muscle physiology, animal behavior, invertebrate zoology, fish and fisheries, animal physiology, systematics and evolution and conservation biology. We will be introducing a topics in ecology course this next year.

Appendices

Appendix #1 – Department of Zoology Undergraduate Assessment Plan

Appendix #2 – Zoology Graduate Student Progress Report

Appendix #3 – Zoology Graduates—Where are thy now? See attached excel file.

Appendix #1 – Department of Zoology Undergraduate Assessment Plan

Undergraduate programs

Assessment will occur during the senior year, and will consist of students writing answers to focused questions. We plan to eventually ask students who are taking our required senior seminar course to write their answers during that course. For those students who have completed this course, we will gather the data via an email survey. Our assessment questions comprise two sets:

Set 1. These questions will tell us how well the students have mastered principles we hope they have learned in the zoology they have taken, it will specifically tell us about student interests and, finally, it will allow us to assess which courses have the most influence on student thinking, career planning, including considerations of possible post graduate employment or education).

- A. For each zoology course you have taken, indicate the most important principles covered in that course. (This question will indicate to us the knowledge that has been retained from each course.)
- B. What have you found most interesting in each course? (This question will indicate to us what students find most interesting in each course).
- C. What course has most shaped your interest in zoology? (This question can indicate to us courses that are especially influential in the degree).

Set 2. These questions will indicate if students are able to see the relationships between the various sub disciplines of zoology, which courses they feel were the best preparation for advanced courses and whether or not students have a good understanding of their area of special interest.

- A. How are the zoology courses you have taken interrelated? (This question will indicate to us how students perceive our curriculum).
- B. Which courses have best prepared you for other courses? (This question can indicate to us the best sequence of courses to recommend to students).
- C. Please define your area of specialization within zoology, and the most important principles within that area.. (The answer to this question can indicate to us the success of our specializations within our degree)

Graduate Programs

Our principle assessment tools for the graduate program are the annual reports required of all current students and our informal follow up on our graduates (we have this data for bachelor's degree graduates as well). We have attempted to locate as many of our graduates as possible, find out if they took additional academic degrees elsewhere, what kinds of positions they have held and what kind of zoological work (e.g., research, resource management, applied sciences). We have attached a sample of recent data (Appendix #3).

Another assessment tool we will formalize is specific surveys (as opposed to the ongoing surveys and polls conducted by our graduate representatives), via email, in which we ask students their opinions about strengths and weaknesses in the program, in particular fields of study, in adequacy of curriculum, teaching and administration of the program. We will also solicit information similar to that solicited in our undergraduate assessment by asking questions that will tell us which courses students found most interesting or influential in their intellectual development.