

WSU Five-Year Program Review
Program Faculty Response to Site Visit Report

Executive Summary

The Zoology Program Review Team made 17 recommendations for improving the Department of Zoology. These could be grouped into three main categories: strategic curriculum planning; strategic planning for faculty and staff efforts; and strategic planning for funds and facilities.

With regard to curriculum, the team recommended (with two possible exceptions) that the Zoology Department offer courses that are already available either within the Department or elsewhere on campus. The Team also recommended that the Department strategize curriculum in the exact way that it is already done. However, the team seemed unfamiliar with the overall mission of WSU and thus seemed to downplay the importance of general education, introductory, and service courses (which are in relatively high demand) in favor of upper-division courses (which are in relatively low demand). While we agree with the intent of the Team recommendations, it is also important to consider the overall mission of the university and the needs of its student body in curricular planning and development.

In addition, the Team suggested that Zoology courses do not transcend taxonomic boundaries or that Zoology majors do not interact with majors from other life-science departments, but this is incorrect. The Team also recommended more “flexibility” for students, but a great amount of flexibility is already present and it is unclear from the recommendations what specific flexibility is lacking. For example, science majors can now minor specifically in Zoology, Microbiology, or Botany in combination with any other major (and vice versa). The array of major-minor combinations within the College provides substantial flexibility for students of all interests. The Team did specifically suggest that the Zoology Department consider integrating introductory classes with other life-science departments, which is a potential action item if other departments are amenable. However, we are skeptical of some of the justification the Team used to support their recommendation course integration.

With regard to faculty and staff effort, the Team’s recommendations again overlooked many existing Departmental efforts and activities. Many of the concerns expressed by the Team are already being handled by the Department. Other concerns were vague and unsubstantiated and many examples from the Department suggest they are unfounded. Recommendations for modifying faculty workload are nice, but their implementation will await either: (1) a mandate from the WSU Administration to reduce course offerings and course enrollments to allow a teaching-load reduction, (2) the hiring of new faculty under a status-quo scenario in which course offerings and enrollments are maintained at present levels, which would allow overall a faculty-workload reduction, or (3) the hiring of even more new faculty to allow simultaneous workload reduction, increased course offerings, and increased enrollment. The number of faculty members required for implementation of all of the Team’s recommendations at a status-quo level that maintains present course offerings and student enrollment would be

roughly 6.8 new contract-faculty FTEs (based on a rough estimate using the qualitative recommendations provided by the Team). Given that no new hires are planned in the near future, the recommendations are collectively unrealistic, although some may be implementable in a case-by-case, strategic fashion. Further, office and research space to support this number of new faculty members is unavailable in the existing Science Lab Building and has not been planned for (i.e., will not be available in) the new (proposed) Science Lab Building. Nevertheless, the Department will make campaigning for new faculty-member positions a priority.

With regard to funds and facilities, the Team's recommendations are supportive in spirit and the Department remains poised to take advantage of new funding and facilities opportunities whenever they present themselves.

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Cover Page

Department/Program: Zoology

Semester Submitted: Spring 2013

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This letter is in response to the program review of the Department of Zoology, Weber State University, which was conducted on 28 February 2013 (Table 1) by a team of four off-campus (independent) reviewers. The Zoology Program Review Team (ZPRT) included David Stokes (University of Washington Bothell), James Price (Utah Valley University), John Cigliano (Cedar Crest College), and Luis A. Ruedas (Portland State University).

Program Review Team Schedule - 28 February 2013 (Thursday)

Time	Activity
8:00	Meet with Dean and Botany Department Review Team
8:45	Meet with Chris Hoagstrom, Zoology Department Chair
9:15	Break
9:30	Meet with John Cavitt in Engineering Technology Building Facilities
10:00	Meet with Michele Skopec & Nicole Berth��l��my in Animal-Care Facility
10:30	Meet with Bob Okazaki & Jon Marshall in 1st floor research lab spaces
11:00	Meet with Brian Chung & Ron Meyers in Lind Lecture Hall and Human Anatomy Lab-Classroom
11:30	Team Lunch with Zoology students
12:30	Team Work Session
13:30	Meet with John Mull in 4 th -floor Science Lab Building Lab-Classrooms
14:00	Meet with Jon Clark in DNA lab
14:30	Meet with Sam Zeveloff in the Animal Collections Room (with refreshments)
15:00	Meet with Lani Shepard & Susan Gurr in Science Lab Building Prep. Room
15:30	Meet with Barb Trask in 4 th -floor Science Lab Building Lab-Classrooms
16:00	Team Work Session
17:30	Meet with Chris Hoagstrom, Zoology Department Chair
18:00	Break
18:15	Dinner with Dean and Botany Department Review Team

We very much appreciate the efforts of these individuals to familiarize themselves with our department and provide a suite of suggestions for departmental improvement. The guidelines for program-review responses call for a “two to three page written response... to the Program Review Evaluation Team report.” However, given that the ZPRT provided 17 separate recommendations, adhering to this brevity in our response is a serious challenge. Further, many of the review and recommendation emphases were not specified in the instructions provided to us as we prepared our program-review self-study document, so we feel it is necessary to provide additional, relevant information in response to the ZPRT. Thus, this document can also serve as a supplement to the original self-study document. In attempting this response we noted what appeared to us to be substantial overlap in intent and implications among many of the recommendations, so instead of responding individually to each of the 17 recommendations, we crafted our response in a more general manner, making reference to each recommendation where appropriate. This larger response is accompanied by an abbreviated executive summary.

I. Strategic planning for an effective Zoology/Life-Science curriculum: (Recommendation 1, Recommendation 4, Recommendation 5)

General planning:

A major emphasis of three recommendations had to do with possible adjustments to the Zoology curriculum. We agree with the spirit of these suggestions and, in fact, already practice most of them. For example, recommendations 4 and 5a describe exactly the process that is followed in the Department. However, course schedules are also constrained by faculty availability, which is subject to many factors (e.g., other courses taught, sabbaticals, student demand). As will be described below, the ZPRT did not appear to recognize the significance of these constraints in the context of their recommendations.

Life-science integration:

The ZPRT recommended that an interdepartmental committee investigate possible development of a common life-science core that would in some way incorporate introductory courses in Botany, Microbiology, and Zoology. The basis of this recommendation appears to be: (1) potential for shared courses to increase curricular efficiency if fewer faculty members among the three departments have to teach introductory courses each semester, (2) flexibility for students changing majors or career paths, (3) increased “breadth” of combined courses that transcend taxonomic boundaries, (4) increased interaction for students and faculty among Botany, Microbiology, and Zoology and other departments.

Disagreement with point 3 – Dealing first with the disagreements, we cannot speak for the Botany or Microbiology courses associated with this recommendation, but from the perspective of Zoology, most our courses do transcend taxonomic boundaries. The basic principles and rules of Zoology, including molecular biology, cell biology, evolutionary biology, ecology, and systematics (which are emphasized in Zool 1110 and Zool 1120) generally apply to all living things. Although all Zoology faculty members can be labeled as “animal biologists” in some sense (such would still be the case in an integrated biology department), non-animal topics are not necessarily avoided and topics that apply to all living things are emphasized in every course. Courses such as Cell Biology (Zool 3200), Genetics (Zool 3300), Ecology (Zool 3450), Evolution (Zool 3720), Zoogeography (Zool 3470), Conservation Biology (Zool 3500), Molecular Genetics (Zool 4300), Wildlife Ecology (Zool 4470), and Aquatic Ecology (Zool 4480) all transcend life-science majors and taxonomic boundaries by their very nature. It is standard practice in all forms of instruction to use specific examples or case histories to illustrate general concepts. It may be true that examples in the Department of Zoology are commonly animal-centric, but this does not compromise the effectiveness of teaching general life-science principles. Other Zoology courses, such as Human Anatomy (Zool 2100), Human Physiology (Zool 2200), Mammalogy (Zool 4680), Ornithology (Zool 4670), etc., are intended to be human-centric or animal-centric. These types of courses are also commonly offered in integrated biology departments, so we do not consider the fact that we offer these courses as evidence that our curriculum lacks life-science breadth. Rather, we offer many courses that transcend taxonomic boundaries and others that specialize on animal/human biology, consistent with the conceptual purview of a Zoology Department.

The ZPRT appeared to be particularly concerned with course names. For example, the reviewers indicated more than once that the Zoogeography course (Zool 3470) should be changed to a Biogeography course. However, this course is (of course) already taught as “Biogeography” using Biogeography texts. Basic biogeographical principles covered in the course are consistent whether plants, animals, or bacteria are the subject of study. Perhaps it would be useful to change the course name to indicate the breadth of the class, but this seems to be a relatively minor issue that is hardly, if at all, associated with student success. Similarly, the ZPRT recommended a Molecular Cell Biology course. However, Cell Biology (Zool 3200) is presently taught as a Molecular Cell Biology course. The word “molecular” just isn’t in the course name. The team also called for a Developmental Biology course. However, our Department already offers Vertebrate Embryology (Zool 4100), which is the same course under a different name. Suggestions by the ZPRT to change these courses or offer redundant ones appear to be based on misconceptions about the Zoology curriculum.

Disagreement with point 4, student interactions – The Zoology major not only requires students to enroll in Zoology courses that transcend taxonomic boundaries, it also requires them to take two courses in Botany or Microbiology (or one of each). Further, many students earn a major in one life science and a minor in another, which requires them to take even more, varied life-science courses. Indeed, the Zoology major requires a minor to ensure that students gain breadth. However, students are allowed to choose their own minor, which gives them the option to take courses outside of life sciences if they prefer. For example, Chemistry is a popular choice because it is closely associated with biology (despite being excluded from the “life sciences”) and the Chemistry curriculum is highly relevant for students interested in medical fields (for example). Substantial integration already exists among all sciences at WSU and is not exclusive to just “life” sciences. This existing integration is voluntary and dynamic, depending on faculty member and student interests and opportunities, whereas the integration suggested by the ZPRT would be prescribed and could potentially reduce existing flexibility. On a “business-model” campus, students appreciate having control over their curriculum. The present College of Science curriculum, as arranged among seven departments, gives students choices over the manner in which their education integrates different science subjects. They have many potential tracks they can follow depending on which physical and life sciences they choose as their majors and minors.

Ambivalence toward point 2 – Students choosing to major in science are normally already familiar with the major scientific disciplines. For instance, most understand the difference between plants and animals and by the time they decide to attend WSU they have a good idea which one they are most interested in. As an example, Chris Hoagstrom has interviewed 51 students interested in a Zoology major (n = 39) or minor (n = 9) over the last two semesters. Of these, 29 (57%) stated an interest in (or love of) animals as the reason for choosing a Zoology major. Nineteen other students (37%) were pursuing a human-health related career. Two students (4%) were interested in genetics and another (2%) was interested in a science major without a heavy mathematics emphasis. Although this is a relatively small sample size, it is consistent with our experience in general. Data collection is ongoing, but Chris has never had a conversation with a prospective student in which the student was confused about the difference between Botany, Microbiology, and Zoology. Many students declare their majors upon enrollment at WSU, which indicates they are on campus for a specific purpose. Indeed, a high

proportion of WSU students are older and more mature than a typical beginning college student, so it is not clear why any Department should specifically adjust curriculum to facilitate a marginal number of students who may or may not switch majors.

There is no doubt that some WSU students are undecided when they enroll or change majors as their education continues. Several students Chris has interviewed (for example) indicated that favorable experiences in Zoology courses drew them to the Department. Thus, less-decisive students are able to gain exposure under the existing program and select an appropriate major when ready, at their own pace. This is the very nature of the “college experience” and cannot be completely avoided. The undecided or inexperienced student will always be at risk of taking some classes that influence their future decisions or do not ultimately contribute to their major. We agree with the ZPRT that more active advising could help reduce the number of these cases, but many students will continue to choose to learn for themselves and it is difficult to believe this is a bad thing because the chance to make independent decisions and sample different opportunities is a basic service that universities offer and clearly falls under the umbrella of “higher education”.

Agreement with point 4, faculty interactions – We agree with the ZPRT that interdisciplinary upper-level courses are valuable. The main stumbling blocks to development of these efforts are time and opportunity. Given high student demand for general education courses (e.g., Human Biology), service courses (e.g., Human Anatomy and Physiology), and basic Zoology courses (e.g., Principles of Zoology, Cell Biology, Genetics) faculty members have limited free time to develop alternative courses and demand for courses that have been developed is often relatively low. Further, interdisciplinary courses are typically collaborative, which means a faculty member in one department with interest in an interdisciplinary course must find a faculty member in another department who is also willing and able to collaborate. This requires rapport between individuals and concurrent availability of both interested parties, decreasing the frequency with which interdisciplinary collaborations are possible. Also, there is little dedicated support, so interdisciplinary efforts must garner permission and backing from multiple departments and administrators.

Nevertheless, the Honors Program provides opportunities for interdisciplinary collaborations and other collaborative courses are taught despite the challenges described above. Within the Honors Program, John Mull has collaborated in a course on water resources with collaborators from the departments of History and English. Barb Trask has helped develop an interdisciplinary course on the science of cooking with a collaborator from Psychology, which will be taught in the upcoming school year. Jon Clark, Chris Hoagstrom, and Michele Skopec have also recently taught interdisciplinary-type courses in the Honors Program, although without collaborators. The interdisciplinary Neuroscience Program includes a partnership between Psychology, Zoology, and Health Professions. Barb Trask is a partner in this program, which includes interdisciplinary courses. Team teaching has also occurred in collaborative Botany-Zoology courses (John Mull, Sam Zeveloff). Further, the Zoology course Parasitology (Zool 4500) was most recently taught by a Professor of Microbiology prior to his retirement (Glenn Harrington). This course is not presently offered, but a new professor in Microbiology (Jason Fritzier) has shown preliminary interest in teaching the course.

Interdisciplinary research including WSU students is also fairly common. Recent examples include collaborations with the Psychology Department (Brian Chung, Bob Okazaki, and students), Microbiology Department (Jon Clark and students), Physics Department (John Mull and students), and Botany Department (Michele Skopec, Sam Zeveloff, and students). The WSU Office of Undergraduate Research and Faculty Senate Research, Scholarship, and Professional Growth Committee facilitate these efforts.

Thus, there is clearly already much interest and activity in interdisciplinary courses and research. If barriers to these efforts could be reduced (e.g., lowered teaching loads, increased support for the Honors Program, Office of Undergraduate Research, and Research, Scholarship, and Professional Growth Committee) interdisciplinary activities and efforts would likely increase due to inherent faculty interest and motivation. For example, there has been recent interest in an Environmental Science major that would be interdisciplinary among the Botany, Chemistry, Geosciences, Microbiology, Physics, and Zoology departments. There may also be opportunities to collaborate with ongoing programs across campus, such as the Environmental Studies minor and the Nutrition Education Program. These programs include some courses recommended by the ZPRT including Environmental Issues and Economic Policy (ECON 1100; comparable to “natural resource policy” recommended by the ZPRT (recommendation 1) and all courses within the Nutrition Education Program (along with Honors courses taught by Michele Skopec and Barb Trask, these courses are comparable to “food science” courses recommended by the ZPRT, recommendation 1). In any case, Zoology courses in natural resource policy and food science cannot be developed without consultation with and endorsement from these existing programs.

Agreement with point 1 – As the ZPRT noted, teaching responsibilities in the Department are substantial and likely limit other important activities such as advising; outreach; research; faculty development; faculty collaborations (including interdisciplinary collaborations); institutional, professional, and community service; and opportunities to offer more diverse upper-division elective courses (including interdisciplinary courses). If integration of life-science courses could maintain capacity to serve students and, simultaneously, reduce overall teaching load invested in those courses, it could create opportunities for more diverse upper-division elective courses. However, demand is not usually high for these courses and the majority of the courses recommended by the ZPRT are already available to students in the Department or elsewhere on campus, sometimes under a somewhat different name (see above). We agree with the ZPRT that Biometry and Translational Research (the only two courses recommended that are not available somewhere on campus) would be valuable offerings if the expertise, desire, and availability from an existing faculty member and student interest warranted them (but, courses in statistics are available in the Mathematics and Psychology departments). Further, the WSU administration provides a consistent and clear directive that ongoing capacity within the Department (student credit hours) must be maintained or increased. Offering fewer high-enrollment lower-division, general-education, and service course sections in favor of low-enrollment upper-division elective courses would be inconsistent with this directive.

Action plan for an effective Zoology/Life-Science curriculum:

Weber State University has a dual mission and this in part explains the high demand for general education, service, and low-level Zoology courses. The following is taken from the Weber State University Vision and Values: “Tradition: For more than five decades, Weber State University has successfully pursued a dual mission by offering a wide-range of baccalaureate and graduate programs *while meeting regional community college needs*. Our vision is for Weber State University to be **the** national model for a dual-mission university that integrates learning, scholarship and community [emphases added].” Although it may be the goal of the ZPRT that the Department of Zoology focus more on Zoology Majors than on other students served by the department (recommendations were almost entirely focused on the number of majors, retention, and post-graduate success) this narrow focus is inconsistent with the University vision and with student demand. It is not an option for the Department to ignore the needs of non-majors or to insist that all Zoology majors remain within the Department through graduation. Rather, it is our mandate to continue to offer high-quality courses at all levels and provide equal opportunities and rigorous education for all students regardless of their majors or ultimate life decisions. However, we also note that the ZPRT emphasized the value of increased degree-completion time. Clearly, required courses must be available for students to complete their degrees, so maintaining availability of these courses is consistent with some (if not all) of the review-team recommendations.

Our present action plan with regard to the Zoology curriculum is to: (1) continue to shift course offerings strategically, when and where possible, to accommodate student demand; (2) also continue to maintain a diverse upper-division curriculum that meets student demand and provides diverse opportunities for Zoology majors; and (3) continue to support faculty interest in diverse upper-division courses, interdisciplinary efforts, and undergraduate research.

1. There is high demand for general education, service, and lower-division Zoology courses. Future efforts will be consistent with recent ones. It is important to note that evening or summer classes largely rely on funding from WSU Continuing Education. Examples of recent efforts to meet this demand include (but are not limited to):
 - a. Adjunct faculty members are hired with funds from WSU Continuing Education to teach multiple evening (including WSU Davis Campus), online, and summer courses including general-education courses and Principles of Zoology I (Zool 1110).
 - b. The new general education course The Nature of Sex (Zool 1030) was developed and is a regular online offering in the Fall, Spring, and Summer semesters.
 - c. Human Anatomy (Zool 2100) has been offered in two lecture sessions (taught by separate Zoology faculty members). Lecture-hall size, laboratory size, and faculty time (work week, school year) limit potential to increase enrollment further.
 - d. Human Physiology (Zool 2200) has been offered online as well as face-to-face in recent years with support WSU Continuing Education funds. Offerings have also been provided during summer and at the WSU Davis Campus.
 - e. For the Spring and Fall semesters 2013 we have offered two sections of Principles of Zoology I (Zool 1110). This course has also been offered during summer as a hybrid

(online lecture, face-to-face lab) course. This course is in high demand and serves majors from several departments. It is a “gateway” course to the Zoology major, so efforts to keep lecture size lower than 75 (lab size is 25) are expected to provide a better experience for the average student and increase interest in Zoology.

- f. Principles of Zoology II (Zool 1120) will be offered in summer 2013. Enrollment is near capacity.
 - g. Cell Biology (Zool 3200) is in high demand as a required course for Zoology majors and a service course for all pre-med students. We will offer two sections of this course in Fall semester 2013 to better ensure students can enroll in this high-demand course in a timely fashion that facilitates their retention and rapid completion time. Enrollment is already near capacity.
 - h. Genetics (Zool 3300) has been recently offered in a larger lecture format including two lab sections rather than the traditional single lab section to accommodate more students. Enrollment was near capacity.
 - i. Evolution (Zool 3720) has been offered online in recent semesters, including during summer.
2. The faculty members of the Department of Zoology are constantly developing or re-developing diverse upper-division elective courses. Recent examples include (but are not limited to):
- a. The Department offers Advanced Human Anatomy each semester as a “Topics in Zoology” course (Zool 4900; Nicole Berthélémy, Brian Chung, Ron Meyers). This is a relatively new offering that serves many pre-med students, regardless of their majors, and provides a high-impact learning opportunity (Zoology Department Self Study).
 - b. Offering of Zoogeography (Zool 3470) was re-established after a multi-year lapse (Chris Hoagstrom).
 - c. Offering of Herpetology (Zool 4660) was re-established after a multi-year lapse (Jon Marshall).
 - d. Offering of Endocrinology (Zool 4220) is in the process of being re-established by Nicole Berthélémy who will prepare materials during her sabbatical in Fall 2013.
 - e. Biomechanics and Biology of Cancer courses have been historically taught by Ron Meyers and Barb Trask (respectively) as “Topics in Zoology” (Zool 4900) offerings. These courses are difficult to offer regularly because, for example, Dr. Meyers plays a critical role in the Principles of Zoology series and Human Anatomy. He also teaches several other upper-division elective courses. Dr. Trask has a half-time course-load reduction (pre-med advisor) and plays a critical role in teaching high-demand (and critical) classes (i.e., Human Physiology, Cell Biology). She also is an important member of the interdisciplinary Neuroscience program and will be an Honors Eccles Fellow in the upcoming school year. Both individuals also maintain active research programs with WSU undergraduate students and off-campus collaborators. These are two excellent examples of the extraordinarily wide involvement that Zoology faculty members have in curricular development which, but at the same time, these examples demonstrate factors that can limit course offerings in a given school year.

- f. In 2010 we adjusted the required curriculum such that only focused student research, limited to 4 hours, could substitute for upper-division elective courses. Prior to 2010, directed readings and Co-op work experience courses could also substitute. This change should boost enrollment in upper-division classes over time. In the meantime, we are offering fewer, less-redundant upper-division classes to increase efficiency (as per recommendation 5a). At present, strong evidence indicates that student demand is much greater for lower-division and required Zoology courses, so faculty workload is being shifted to those classes (as described above). Lower-division, general education, and service courses remain a priority because they are critical for: (1) serving the WSU mission, (2) recruiting and retaining Zoology majors, and (3) facilitating degree completion.

Depending on interest from other departments, the Department of Zoology would participate in efforts to investigate the possible development of a “common core” for courses that might have “substantial overlap and commonalities”. If such a team were assembled, we believe it should include representatives from all Science departments and from across campus because these changes would affect life-science minors as well as majors. Further, we suggest that at least the following subjects should be thoroughly evaluated:

1. How much overlap really exists in putative “common” courses?
2. If there is substantial overlap, is it more desirable to integrate courses or, alternatively, to make existing courses more distinct from each other within the present framework?
3. What are student preferences with regard to introductory courses: more specialized or more generalized?
4. How much effort would be required to integrate courses?
5. Which departments and faculty members would be responsible for integration?
6. What support (e.g., release time, supplies, materials, equipment, classrooms, and laboratories) at the departmental, college, university, and extramural levels would be required for course integration and is such support available?
7. Which departments and faculty members would be responsible for each integrated course?
8. How would course integration affect class size?
9. If class sizes were larger and filled a large number of lab sections, could laboratory instruction be conducted by students or instructors supervised and coordinated by contract-faculty members?
10. How would course integration affect frequency of offerings?
11. How would an integrated curriculum affect majors from other departments and colleges?
Integration is more than just a life-sciences concern.
 - a. For example, how would integration affect a student who is majoring in Chemistry and minoring in Zoology? Would that student prefer a general life-science course or a more specialized Zoology course?
12. How would the curriculum transition from existing to integrated formats?
13. Do the benefits of curricular integration have strong, empirical support that suggests they equal or outweigh costs and tradeoffs of instituting change?

II. Strategic planning for Zoology Department faculty & staff time: (Recommendation 2, Recommendation 3, Recommendation 4, Recommendation 6, Recommendation 7, Recommendation 8, Recommendation 13, Recommendation 14, Recommendation 15, Recommendation 16, Recommendation 17)

The ZPRT provided a suite of recommendations generally associated with the manner in which faculty and staff time is used. Our response to these recommendations has three main components. First, several of the recommendations are already part of ongoing practices in the Department and across campus. Second, some of the recommendations suggest shortcomings of the department without supporting evidence. Third, some of the recommendations are mutually exclusive and thus require judgment regarding priority and feasibility. Our response here deals with these three issues prior to presentation of an action plan.

Existing activities addressing recommendations: Several of the strategies suggested by the ZPRT are already in place, at least in some form:

1. Faculty receive teaching credit for work with undergraduate participants (recommendation 2):
 - a. At present, faculty members accrue 0.25 credit hours for each student credit hour supervised (WSU Policies and Procedures Manual 4-6). It is unclear if team members were recommending a change in this policy or were unaware of it.
2. Integrating undergraduate research into courses (recommendation 2):
 - a. Some Zoology Department faculty members already include undergraduate research as part of upper-division elective courses. Examples include courses taught by Chris Hoagstrom (Zool 3470; Zool 4480; Zool 4650) in which students complete semester-long projects and present their final results in the WSU Undergraduate Research Symposium or other venues.
 - b. Other Zoology Department faculty members include community outreach and service in upper-division elective courses. Examples include courses taught by Sam Zeveloff (Zool 3500; Zool 4680) in which students complete semester-long projects that foster community awareness of animal conservation.
3. The Department continually explores the feasibility of offering more evening and online courses exactly as suggested by the ZPRT (see discussion above, recommendation 7). These offerings are limited primarily by funding, but faculty-member interest and student demand help determine which courses are offered when and where.
4. New faculty members are given a reduced teaching load in their inaugural semester (recommendation 13; see Zoology Department Self Study, p. 31). It is not clear to what extent the ZPRT Team recommends teaching reduction for new faculty. Also, the present workload model is set by WSU and COS policies and teaching 24 credit hours per academic year is the primary responsibility of all faculty except those with administrative positions, who receive course reductions (WSU Policies and Procedures Manual 4-6). An alternative or supplement to reduced teaching loads for new faculty would be reduced expectations for scholarship and service, which are not presently incorporated into the faculty workload. However, if department-wide teaching loads were reduced (see below) this would also help new faculty

members. Regardless of concerns of the ZPRT, all Zoology faculty members have been granted tenure and are fully promoted given their time served within the Department, which suggests new faculty are able to succeed under the existing system (although improvements are certainly possible and we agree with this recommendation in spirit).

5. Faculty development opportunities exist on campus through the Center for Science and Math Education, the Teaching and Learning Forum, and the Faculty Senate Research, Scholarship, and Professional Growth Committee (recommendation 14). It is not clear whether these opportunities meet the recommendations of the ZPRT.

Unsupported implications of Zoology Program Review Team verbiage and recommendations:

Shortcomings implied by many of the ZPRT recommendations are not supported by any evidence we have available. While we agree that efforts to address such issues could be beneficial and that efforts to collect data on these issues could be useful, we are presently focused on more obvious and supportable shortcomings. We cannot justify expending limited departmental resources on perceived shortcomings that have no basis or are contradicted by available evidence.

1. While we agree that undergraduate research is extremely valuable (recommendation 2), we make every effort to extend undergraduate research opportunities to interested students. Undergraduate research is demanding and not all students have adequate interest, dedication, or time to participate. Forcing students to engage in research is not a viable strategy and can create a substantial drain on limited faculty-member and departmental resources for little return. Further, many students who indicate an initial interest in research either lose interest or are ultimately unable to effectively complete a project. The student-mentor relationship is a critical aspect of undergraduate research and thus the undergraduate research program must remain under the control of individual faculty members. We agree with the ZPRT that more free time for faculty could increase opportunities for undergraduate research, but disagree that there should be an effort above the level of the individual faculty member to increase it. For faculty members to conduct successful research with students, or otherwise, they must be able to dictate their own research programs and select their own participants. Other factors that could increase faculty capacity for undergraduate research would be increased internal support via funding and facilities and increased internal support for efforts to procure and administer external grants. As noted by the ZPRT, increased undergraduate research within courses relies in part on (or is at least facilitated by) maintaining small class size. In any case, there is substantial research activity within the Department and we are unaware of any demand for research opportunities that is unmet. Further, the ZPRT indicated within their review that there was no information available on students participating in undergraduate research (page 5). Despite this statement, detailed information on student research activities was included within the Zoology Department Self Study (pp. 13-15, Appendix D). For example, 97 students enrolled in independent-study courses, 51 participated in the WSU Research Symposium and Celebration, 18 participated in the WSU Day at the Utah State Capitol, 24 participated in the National Conference on Undergraduate Research, three completed theses in Zoology, 54 were

awarded grants from the WSU Office of Undergraduate Research, 38 published articles or abstracts in the WSU Undergraduate Research Journal ERGO, and 20 presented research findings in off-campus venues during the study period.

2. The Department already explores feasibility of offering evening, online, and summer courses (recommendation 7, see above). The maximum possible of these options is offered every semester. Offerings are limited by available funds.
3. All Department faculty members continuously engage in efforts to maintain an up-to-date pedagogy (recommendation 14). Faculty members commonly update textbooks, lecture materials, course formats, etc. Several courses are taught in a team or collaborative format within the department.
 - a. For example, the Principles of Zoology I and II courses (Zool 1110 and 1120) are taught in a team format every semester and participating faculty members (Chris Hoagstrom, Jon Marshall, Ron Meyers, John Mull, Bob Okazaki) have frequent conversations about ways to improve each course. The laboratory manuals and exercises are updated and re-evaluated regularly, often on a semester-by-semester basis, with input from multiple faculty members.
 - b. The Human Anatomy courses (Zool 2100 and 4900) are taught in an integrated fashion with substantial collaborative efforts between Drs. Chung, Berthélémy, and Meyers. Efforts to improve course coverage and laboratory activities are made regularly.
 - c. Courses taught by more than one faculty member (e.g., Cell Biology, Zool 3200; Genetics, Zool 3300) include collaborative efforts to strengthen course content, laboratory materials, and laboratory activities.
 - d. While we agree that more support for faculty development would be beneficial, existing support is not trivial and the commitment of Zoology faculty members to their own development is strong. Some faculty members attend off-campus activities relevant to professional development or participate in formal and informal groups on campus. The curriculum throughout the Department is up to date.
4. We know of no basis for apparent assumptions that retention is low, advising is inadequate and inequitable, and graduates are unsuccessful in the Department of Zoology, yet verbiage implying a need for improvement in these areas recurs throughout the Zoology Program Review document. While we agree that more data on retention rates and graduate success would be beneficial and advising can always be improved, available evidence (Zoology Department Self Study) and our observations indicate that retention is high for motivated students and that graduates have high rates of success. The pre-health-profession field is one example where good records are kept. These records show that Zoology Department graduates enjoy a high acceptance rate to medical school that exceeds a relatively high cumulative rate for the entire university (Zoology Department Self Study, pp. 16). Given that acceptance to medical school is a lofty goal, we believe this is strong evidence for graduate preparedness overall. Further, graduates with a variety of career goals, including but not limited to medical school, report back that they were well prepared. The same feedback is frequently provided by individuals from organizations that hire Zoology Department graduates. Other students leave the department prior to graduation to attend dental school or pharmacy school. These students certainly have

met their goals and found success, whether or not they graduate from the Department. Other students who change majors may decide they are more interested in other subjects, which is not necessarily a failure of the Zoology Department. Consistent with the dual mission of WSU (see above), our approach is to offer students the resources and opportunities they need to reach their goals rather than to pre-determine what those goals should be. Indeed, course evaluations (Zoology Department Self Study, pp. 26-30) and graduate surveys (Zoology Department Self Study, pp. 19-20) indicate that Zoology students are very satisfied with their experience in the Department.

5. We agree with the reviewers that a survey of graduates is beneficial, and in fact such a survey has been implemented since 2007 (Zoology Department Self Study, pp. 19-20). Apparently the ZPRT overlooked this information. We also keep track of subsequent student outcomes to the extent possible (Zoology Department Self Study, Appendix E). While the information available indicates student success, we intend to continue these practices so that we can continuously evaluate our success and identify shortcomings of our Department.

Cumulative assessment of effects of recommendations for modification of faculty workload: While we agree with many of the recommendations provided by the ZPRT in spirit, implementation is a challenge due to limitations of funds and facilities (discussed below) and contradictions/incompatibility among recommendations (discussed here). The ZPRT frequently emphasized the need for increased free time for faculty members. They also frequently mention the need for increased enrollment, increased majors, increased retention, and increased faculty-member involvement. The only way to satisfy both types of requests simultaneously is to recruit and hire more faculty members. Here, we summarize recommendations of the ZPRT that would require more faculty members if implemented.

1. Lower teaching loads require more cumulative faculty members to maintain existing course offerings. For example, current contract faculty FTEs = ~12 at 24 semester hours per academic year (i.e., 288 semester hours). If each faculty member (i.e., each FTE) was granted a one-course (3 hour) reduction, this would reduce current contract faculty semester hours to 252, leaving 36 hours to be filled by new FTEs to maintain present credit-hour and course offerings. Thus, it would require 1.7 new FTEs at the reduced workload (21 hours per academic year) to maintain status quo. This would not necessarily account for expanded course offerings or higher student enrollment recommended by the ZPRT and would require additional facilities for new faculty members, although the ZPRT has noted the inadequacy of existing facilities for existing faculty members.
2. How many faculty-member FTEs would be needed to facilitate recommended activities?
 - a. *Release time for multiple faculty members to ensure high-quality advisement (recommendation 16):* Barb Trask, the pre-medical advisor, currently receives a six-hour workload reduction to facilitate pre-health profession advising. A comparable workload reduction for 2 more contract-faculty members might satisfy the concerns of the ZPRT (although this was not specified). If so, then another 0.6 FTEs would be needed to provide release time and maintain status quo at a reduced, 21-hour workload.

- b. *Increased credit for laboratory contact hours:* For Spring semester 2013 (a semester with no faculty members on sabbatical) faculty (including one adjunct professor) are engaged in 29 two-hour labs and seven three-hour labs. At present, faculty members receive half workload credit for each laboratory contact hour (WSU Policies & Procedures Manual 4-6). Thus, credit is awarded for laboratory instruction in Spring 2013 is 39.5 hours. An additional 39.5 contact hours occur without credit awarded. If extrapolated to a full academic year, 79 un-credited laboratory contact hours over two semesters represent 3.8 FTEs that would be needed to provide full credit for laboratory-teaching efforts, maintain status quo, and institute a reduced, 21-hour workload.
- c. *Workload multiplier for high-enrollment classes:* Several Zoology faculty members commonly teach high-enrollment classes in face-to-face formats, such as daytime Human Biology (Zool 1020), daytime Principles of Zoology I (Zool 1110), Human Anatomy (Zool 2100), Human Physiology (Zool 2200) or in online formats, such as The Nature of Sex (Zool 1030) and Human Physiology (Zool 2200). The Zoology Program Review Team suggested the possibility of using a workload multiplier to give faculty members more teaching credit for high-enrollment classes. There are different models for workload multipliers, but for the purpose of this review, we follow the models of Southern Utah University and the University of Texas, both of which consider enrollment of 60 or more students as high. The University of Texas workload multiplier is employed here as an example because it is more accurate (i.e., it recognizes narrower enrollment categories) than the Southern Utah University workload multiplier. However, the two multipliers are qualitatively similar. Using the Spring semester 2013 enrollments as an example (again), third-week enrollments would award professors teaching seven different high-enrollment classes in-load a cumulative total of 6.9 additional credit hours. If extrapolated to a full academic year (two semesters) this equals 0.7 FTEs that would be needed to provide extra teaching credit and maintain status quo at a reduced, 21-hour workload.

Action plan for Zoology Department faculty & staff time:

The fact that many of the recommendations provided by the Zoology Program Review Team are consistent with ongoing practices within the Department of Zoology provides evidence that overall departmental policies and practices are appropriate. We believe this is consistent with our record of success including evidence of high student and graduate satisfaction, evidence of graduate success, record of undergraduate research success, etc. Thus, our first course of action is to maintain existing strategies and emphases that are consistent with concerns of the Zoology Program Review (see above).

Based on the rough estimates of faculty time required to meet recommendations of the ZPRT (above), up to 6.8 new FTEs would be needed to maintain current credit-hour and course offerings while simultaneously reducing the faculty-member workload, increasing release time for advising, increasing credit for laboratory contact hours, and increasing credit for high-enrollment classes in the manner recommended by the ZPRT. Yet, this estimate is conservative because it does not account for other recommendations such as: (1) increased engagement in undergraduate research within courses and via

independent study, (2) faculty-workload buyout for individuals active in scholarship, (3) alternative faculty schedules including evening, weekend, and summer courses, (4) increased department outreach across campus, to the community, and to high schools and community colleges, (5) increased development of faculty teaching methods and materials, (6) release time for new faculty, and (7) increased majors with increased demand for upper-division courses, more faculty qualifying for workload-multiplier credit, and increased need for advising. Thus, our second course of action will be to begin preparation of proposals for additional contract-faculty members to fulfill specific curricular needs and increase capacity to offer more credit hours and courses. We agree with the ZPRT that new faculty members with expertise in Molecular Biology and Biometry would be beneficial. In addition, high demand for Human Anatomy and Physiology courses suggests new faculty members with this expertise would be valuable.

It is critical to note that the above workload estimates assume a status-quo model to maintain existing credit-hour and course offerings. This is an important part of the annual mandate set by University and College administrators. However, the ZPRT repeatedly emphasized the opinion that the Zoology Department should be focused on increasing the number of majors and graduates while also increasing course offerings. Thus, while the general recommendations of the ZPRT for restructuring Zoology faculty workload (above) are conservatively estimated to require up to 6.8 new FTEs for full implementation, increasing majors, graduates, and course offerings would increase the need for new faculty even more. Hence, it is clear that the ZPRT did not ground their recommendations in the setting within which the Department of Zoology exists. While we would love the opportunity to dramatically expand the Department faculty, curriculum, and credit-hour offerings, we recognize that the opportunity to hire new faculty members is remote and the number of new faculty members that would be required to support all recommendations and growth appears to prohibit implementation of all of these recommendations simultaneously while at the same time growing our majors and curriculum.

Further (and perhaps of even greater concern) is the lack of facilities to support additional faculty members within the Department. No additional faculty-office space is available at present and (as noted by the ZPRT), existing research space is already inadequate for the existing faculty members. There are plans at present to incorporate space for additional faculty offices and research laboratories in planning for the proposed, new Science Laboratory Building. However, gaining office and research-lab space for up to three additional faculty members is the present (optimistic) request. Thus, it may not be realistic to expect the Zoology Department to grow by 6 or 7 faculty members in the near future and whatever growth occurs is likely to be gradual, one faculty member at a time. In the meantime, we expect to continue existing strategies (above, Zoology Department Self Study) to maintain and enhance scholarly success.

III. Strategic planning for Zoology Department funds & facilities: (Recommendation 9, Recommendation 10, Recommendation 11, Recommendation 12, Recommendation 17)

The final group of recommendations provided by the ZPRT directly addressed limitations of facilities and funding. These are each discussed below prior to presentation of an action plan.

- With regard to recommendation for a field-research vehicle (recommendation 9), the review team may have been unaware that vehicles are available through the WSU Vehicle Fleet. Although having a dedicated set of vehicles for the Department or for several departments in the College would be convenient, it would also come with additional responsibilities and expenses. Thus, this decision would have to be made cautiously. At present, the Department does administer one field vehicle that primarily serves the Avian Ecology Laboratory. It has not been determined how many vehicles would be necessary to serve additional, much less all Department faculty members, nor has it been determined how many would be needed to serve all field activities within the College. This assessment would be an important first step because if only one field vehicle were purchased, it is likely most field work would still rely upon motor-pool vehicles either because multiple vehicles would be needed at the same time or because the single COS vehicle would not be suitable for all needs. The more vehicles that were purchased, the more need there would be for dedicated staff or faculty to oversee their administration and maintenance. Thus, it may be more efficient to continue to use motor-pool vehicles, or perhaps to arrange a cooperative arrangement between the College of Science and WSU Vehicle Fleet. In any case, the Department of Zoology does not have access to funding to develop a fleet of department vehicles with staff or faculty oversight. However, if funding were to become available, it would be valuable to assess departmental and college-wide needs and consider tradeoffs between collaborating with the WSU Vehicle Fleet versus maintaining a separate fleet of field-science and/or field-trip vehicles.
- The ZPRT also noted deficiencies in the condition and size of laboratory research facilities (recommendation 10). We, of course, agree with these concerns and also hope that the proposed new Science Laboratory Building will provide more research space. The Department has requested such spaces from the planning architects and will continue to advocate for these spaces. However, we have also been warned that the new building may not offer much additional research space, so we will have to wait and see what ultimately becomes available. In the meantime, we plan to continue efforts maintain effective research within the facilities that are available.
- The ZPRT further noted deficiencies in teaching laboratory facilities and equipment (recommendation 11). We, of course, also agree with these concerns. We do expect the laboratory teaching facilities in the proposed new Science Laboratory Building to provide substantial improvements. We are also continuously engaged in updating laboratory materials and equipment using available funding including laboratory fees (Zoology Department Self Study, pp. 34-38).
- We agree with the ZPRT that full sabbatical replacements would benefit the Department (recommendation 12). Whenever such funding is available we intend to make full use of it.

- The basis of the recommendation for an additional staff person (recommendation 17) is unclear. Staff members are not overloaded with work and there are no critical staff responsibilities that are left undone. The Department also continuously seeks opportunities to employ students to assist Department staff. Presently, three such students are employed.

Action plan for Zoology Department funds & facilities:

Because departmental funding and facilities are largely decided outside the Department, our main course of action is to maintain existing success, look to improve where possible, and prepare for and seek opportunities to procure new funding and facilities when available. As such, we are working closely with the planners of the new (proposed) Science Laboratory Building. Barb Trask is the Department representative on the Steering Committee for the building planning. She diligently attends meetings, updates the Department Faculty of developments, and surveys department faculty members for their needs.