

BOTANY DEPARTMENT'S RESPONSE TO THE REVIEW TEAM REPORT

INTRODUCTION

The Botany Department appreciates the effort put forth by the Review Team in the evaluation of our department and program. We believe that their findings are supportive of the department's role in the university, state and the region. It seems that the Review Team feels that ours is a viable, strong, and growing Botany Department, and that we are proceeding in a positive direction. Overall, we agree with most of the Team's findings and will take their recommendations into consideration as we hire new faculty to replace retirements and expand the program.

Summary of Recommendations for Change

The Botany Department is a highly functioning department. They have a unique identity and niche in Utah and the region, and an excellent reputation in student preparation into field types of careers. They hold a high level of collegiality, enthusiasm, and dedication – all of which should be rewarded and nourished. We recommend that the Botany faculty number be maintained at a minimum of six faculty so that the curriculum can be modernized and further energized.

We further recommend that the Department consider addressing the following:

Recommendations for Change:

- 1. We recommend that the Botany faculty number be maintained at a minimum of six faculty so that the curriculum can be modernized and further energized.**

Response: The department concurs with the Review Team's recommendation. The last program review also stated that the minimum critical mass of our faculty is six in order to offer required courses in a consistent fashion accommodate increased student research mentoring needs, pursue individual research and funding, and provide representation on departmental, college and university committees. With only 4 ½ faculty positions currently filled, course offerings have been curtailed, many sections are too large for effective interaction, and faculty are overworked with teaching, service, and student mentoring. Outreach efforts, although continuing, are limited and the potential for interaction with schools and the community for service and student recruitment are woefully underutilized. The need for faculty may grow in the future as the program expands into new areas (Pre-Natural Medicine, Ethnobotany, Forensic Botany, Restoration/Sustainability of Ecosystems, Climate Change, etc.). This may be somewhat offset by course delivery/pedagogy choices, but increased student research will demand more and more of our time. Opportunities for individual research will also have to increase.

Action Plan/Timeline: The Botany Department is in the process of developing job ads for two new faculty positions to be advertised in the Fall 2013, with new hires to start in Fall 2014. One of the planned positions is an Ethnobotanist who specializes in chemical extraction and identification of active plant compounds in medicinal plants. The second position will be a Plant Restoration Ecologist who specializes in ecosystem monitoring, plant ecosystem sustainability, and soil restoration.

- 2. Standard A, Mission Statement. The Department is meeting guidelines, but we recommend they develop a strategic plan which will aid in guiding new faculty hires and restructuring the curriculum.**

Response: We agree that the department is on the verge of major changes, with up to half of the faculty potentially being new hires within five years. Although we look to expand our Ethnobotany offerings, strengthen our Pre-Natural Medicine curriculum, and explore new directions in sustainability

of ecosystems, etc., it will be imperative to develop a formal strategic plan with input from the new faculty. This will be especially important in long-term planning.

Action Plan/Timeline: Short-term plans include beginning to pursue a formal status for the Pre-Natural Medicine Option as a Track, and possibly a new pre-professional program, through the Board of Regents during 2013-2014. Expansion of introductory Botany lab courses to the Davis Campus will start in Fall 2014, with the building of a greenhouse at the Davis campus during 2013-2014. This will undoubtedly bring in new majors, as several high schools in the area have built greenhouses and student interest in Botany has been cultivated in those public schools. Certificate programs or a possible Associate's Degree will have to wait until we get input from the new faculty to be hired next academic year.

3. **Standard B, Curriculum. The Department should carefully reassess the curriculum in terms of serving both botany majors and general education.**

Majors:

-Additional research should be done to insure that the proposed pre-natural medicine Track A option meets the specific requirements and expectations of existing programs in natural medicine.

Response: In reviewing the prerequisites for each of the seven Natural Medicine Schools in North America, the Pre-Natural Medicine (ND) Option within the Botany Track A major provides all required courses. In addition, this Option either requires or recommends that students take courses that are recommended by some schools. Currently, Human Anatomy and Human Physiology are recommended in all ND programs, but the ND Accreditation Board is considering making them required prerequisites in the future. These courses are already required within our major. Hence, our graduates will be well prepared and highly qualified for admission to all of the accredited schools.

Action Plan/Timeline: The department will continue to communicate with the ND schools and monitor any changes in prerequisites. Within the next two years, we plan to have all of the ND schools review our course syllabi and approve them to streamline the admission process for our graduates. We believe that the new Ethnobotany faculty hire will increase student numbers in this major. Within the next year, we plan to begin the process of having the Pre-Natural Medicine Option approved by the Board of Regents as a new Track, and perhaps a new Pre-Professional program.

- The core curriculum for the major should be standardized for each track with necessary changes to additional botany course requirements.

Response: The department will re-examine its major tracks when new faculty are hired. Course offerings will likely change to some extent. There is some merit in having a common core with different tracks requiring additional Botany courses that best complement each track's emphasis.

Action Plan/Timeline: Curriculum review will begin in 2013-2014, but major changes will likely wait until we can get input from new faculty in 2014-2015.

-The contribution of existing upper division electives should be evaluated in terms of existing faculty and the desired expertise of future hires.

Response: Once Gene Bozniak completely retires, the department will no longer be able to offer Marine Biology and the ability to offer Algology is in doubt. We will re-evaluate our course offerings with the new faculty hires' expertise in mind and submit curriculum proposals for new courses as determined by the expertise of the new faculty. As a department, we will also determine which upper division courses, both electives and required courses, would best meet the needs of our students and the frequency at which they will be offered.

Action Plan/Timeline: Until the new faculty are in place and their interests and expertise are determined, we will not be able to fully re-evaluate our upper division course offerings. Existing course

offerings will be re-examined in light of any new emphases within the program. We plan to begin the process starting Spring/Fall 2014, assuming the new faculty positions are filled.

-The Department should pursue additional interdepartmental cooperation in common areas:

-An introductory biology course, or sequence, as recommended in "Vision and Change" and including cell/molecular biology, genetics, evolution, and ecology.

-The biology composite teaching major.

Response: A General Education course, as described in the following section, could be taken by all Life Science majors as a second LS course to fulfill Gen Ed requirements if desired. The existing course, Principles of Life Science, covers all of the concepts listed above, as do all LS Gen Ed courses. If the course is cross-listed in all three LS departments, it would likely replace Nutrition as a LS choice for many of our majors. It would provide a broad background in general LS concepts and would likely draw new majors for Botany, Microbiology and Zoology. The department would like to pursue the Gen Ed course, and see how it works, but an additional Life Science course for majors is not being planned at this time. We do feel that the Gen Ed course would provide a good foundation for students who choose a major in one of the three departments. Each department offers more in-depth, 2000-level introductory courses for majors.

We agree that more emphasis should be put on the Biology Composite Teaching major. Once a new Center for Science and Math Education (CSME) director is hired, this could tie in with increased outreach to K-12 schools.

Action Plan/Timeline: As described below, the Chairs of all three LS departments as well as some of the faculty have expressed interest in discussing the course. Preliminary discussions will be held in Summer 2013 and feasibility of team-teaching, cross-listing, and scheduling will continue in Fall 2013.

Increased recruitment for the Biology Composite major could begin in the 2013-2014 year, hopefully coinciding with the hiring of a new CSME director.

General Education:

The Department should consider pursuing additional interdepartmental cooperation in offering general education courses.

Response: As early as Spring 2013, the Botany Department approached the Microbiology and Zoology Departments with the suggestion of revamping the existing LS 1370 (Principles of Life Science) Gen Ed course. Botany has taught this course for several years, with Zoology helping in the past three years. It is currently recommended for students who are going into Elementary Education. We feel that this existing, cross-listed Gen Ed LS course could be improved, team-taught, and marketed to a wider audience, possibly as a hybrid class. No changes to the current Gen Ed status or course description would have to be made. If the teaching and credit are divided equally among the three Life Science departments, this could become a very popular Gen Ed LS course and has the potential to draw new majors to all three departments, as students learn more about each discipline and choose the Life Science area that most interests them. This may also increase interest in the Biology Composite major and become a source of new, science-minded, elementary school teachers.

Action Plan/Timeline: Initial discussion among the three LS departments has begun and will continue in Summer 2013. Potential scenarios can be developed among the chairs this summer and will be brought to the three faculties in Fall 2013 for further input and discussion. The course is usually offered in spring semester, so it is definitely possible to offer a trial run of the new format in Spring 2014.

4. Standard C, Student Learning and Assessment.

-The Department should consider adapting existing assessment instruments, validated content inventories and inventories of general science literacy skills, in all classes.

Response: The department agrees that the recently developed list of questions to be used in all LS Gen Ed courses to assess the Learning Outcomes is not adequate for all of the LS Gen Ed courses. We will evaluate existing nationally validated assessment tools for potential use in Botany. We will also encourage other departments, and the Gen Ed LS Subcommittee, to investigate adoption of the same.

Action Plan/Timeline: The Botany Department has taken the advice of the Program Review Committee and is already looking for existing assessment instruments and validated content inventories. We will continue these efforts in Summer 2013. Our goal is to have specific questions for all of our gen Ed LS courses to be used to assess all eight Learning Outcomes in Fall 2013. Ideally, if a national tool is found and accepted by Fall 2013, we will incorporate it then. If not, we will use our own questions until another acceptable tool is found. We will also solicit suggestions from new faculty hires.

-The Department should consider developing a curriculum assessment rubric utilizing information from student portfolios.

Response: We agree with the Review Team's suggestion of developing assessment rubrics in all courses. All of the Botany courses have specific Learning Outcomes. At some level, they are all tied to the Departmental Learning Outcomes outlined in the Botany student portfolio. Different courses emphasize some outcomes more than others. Some courses already have such rubrics, but we are working on developing them for all courses. The development of specific rubrics would be helpful for data collection and for students as they assemble their portfolios.

Action Plan/Timeline: This is a work in progress. Some of our courses already have rubrics tied to the Botany Department Learning Outcomes which are the focus of the portfolio. Each year, we are developing more of these rubrics and use them as a source of assessment data in annual assessment reports. This information is also used to improve course content, delivery, and quality.

-The Department should pursue additional means of sending students to professional meetings.

-The Department should pursue cooperating with other science departments to establish a local *Beta Beta Beta* chapter and *Sigma Xi* Chapter.

Response: We agree with the Review Team that additional funding sources should be pursued to send students to professional meetings. Currently, students apply for OUR grants and may get financial help from the Dean's Office. This year, students have also applied for funding from professional organizations (Botanical Society of America, etc.). We will investigate other avenues, such as botanic gardens, etc.

The College of Science already has a chapter of *Sigma Xi*. We anticipate increased student participation as more students complete Botany Thesis projects. The Botany Club has also just established a Student Chapter of the Botanical Society of America (BSA).

Action Plan/Timeline: We are currently exploring additional sources of funding for student travel to professional meetings. The capital campaign, which starts in January 2014, may provide additional sources from certain donors.

We plan to encourage increased student participation in *Sigma Xi* and BSA starting in 2013-2014.

5. Standard D, Academic Advising.

-We recommend that student advising be distributed among the faculty.

Response: We agree, in part, with the recommendation. Currently, all formal advising is done by the department chair. Individual faculty often advise research students who work with them in terms of additional courses to take, graduate school, careers, etc. In the past, we tried dividing students among individual faculty, but we found that it did not work very well. Initial advising of new majors and minors

will continue to rest with the chair. It provides consistency and is helpful for students when they know one person to talk to. We also believe that initial personal contact with the department chair with ample time spent helps set the tone of our commitment to making every student feel like an individual and a member of our department. Once we hire a full complement of faculty, we will likely assign students with particular interests to a specific faculty member with expertise in that area (Ethnobotany, etc.). The goal may be to develop advising specialties among the faculty for our junior and senior students. As the number of majors increases, this will likely be more efficient and helpful for students. Action Plan/Timeline: No changes in advising will likely happen in the next year. Once we hire new faculty for the 2014-2015 year, we will investigate more options with input of new faculty.

6. **Standard E Faculty.**

-Faculty development has been sacrificed to maintain the existing curriculum as faculty numbers declined. As new faculty are hired, existing faculty should reduce their teaching loads and re-focus on their own professional development, including: research in collaboration both with students and faculty colleagues; participation in workshops; and attendance at professional meetings.

Response: We agree with the Review Team that the current faculty's teaching loads have been too high in order to compensate for reduced SCH production due to retirements. The Dean's office has been extremely supportive by providing some money to hire adjuncts. As a department, we felt that this would be a worthwhile short-term situation that would ultimately help build the case for hiring two faculty members to replace the most immediate retirements. In order to maintain SCH production, personal research and opportunities for professional development have taken a back seat to mentoring increasing student research. Once new faculty are hired, time for research will be freed up for current faculty due to SCHs from Thesis, Readings, and Independent Research students that have been accumulating over the past few years. Each faculty member has accrued at least one course reduction, and some have banked more. The department will continue to maintain records and grant earned release time in the future.

Action Plan/Timeline: Records will continue to be maintained and once new faculty are hired in Fall 2014, release time will begin to be granted to current faculty. As a department, during 2013-2014 we will decide upon a schedule for release time to begin in Fall 2014.

-New faculty hires should complement the current strengths of the Department and add to the Department's teaching and research capacity.

Response: The two new faculty that we have requested to replace retired faculty will be an Ethnobotanist specializing in chemical extraction of plant compounds from medicinal plants and a Restoration Ecologist who specializes in ecosystem monitoring, soil and/or ecosystem restoration, and/or sustainability of ecosystems. The former will add depth and breadth to our existing Ethnobotany offerings as well as support and strengthen the Pre-Natural Medicine curriculum. The second hire will provide expertise in our ecology/environmental track and will support our efforts to support sustainable food production (community gardens, etc.). Both will provide new research opportunities for students. They will also be able to collaborate with faculty in Geosciences, Microbiology, Zoology and Chemistry.

Action Plan/Timeline: We plan to hire both faculty members in 2013-2014, to begin in Fall 2014.

7. **Standard F. Support.**

-A half-time, 10-month Administrative Assistant is inadequate and places additional burden on an already overstretched faculty to do clerical work. We recommend that this be made a full-time position.

Response: This recommendation was also made by the Review Team during our last program review five years ago. We agree that with increased marketing, tracking of majors and graduates, Botany Department Advisory Board(s) activities, and perhaps an expanded program, the need for a full-time secretary will be necessary once we move to the new building, if not before.

Action Plan/Timeline: The department is trying to build the program incrementally, moving into new, under-served niches (Ethnobotany, Pre-Natural Medicine, sustainable ecosystems, sustainable food production, Forensic Botany, etc.). With proper planning, marketing, and increased enrollment and graduation rates, we intend to build a very strong case for a full-time secretary within 2-3 years.

-The Botany Club should be encouraged to develop innovative and engaging (interactive?) displays for the Natural History Museum focusing on plants.

-Both the herbarium and greenhouse are indispensable resources for botany teaching and research and should be included in plans for the new science facility.

Response: We agree that the Botany Department and Botany Club could develop displays in the Natural Science Museum. Two graduates from our department recently developed a display and informational pamphlet on lichens for Red Butte Garden in Salt Lake City. A similar display is being planned for WSU's Museum. The new building and potential expansion of the Natural Science Museum will provide many opportunities of this type. We have discussed the possibility of establishing a demonstration garden on the site of the current Science Lab building once it is torn down.

We agree that the herbarium and greenhouse will be indispensable in the new building.

Action Plan/Timeline: The lichen display is currently in the planning stages, with possible establishment in 2013-2014. Once the old building is removed and the new one built, additional displays/demonstrations will be planned.

8. **Standard G. Relationships with the external community.**

-The Department needs more marketing and recruiting assistance.

Response: We agree that the department and college need more marketing and recruitment assistance. This has been a chronic problem for years. A college recruiter would be very helpful, but is not affordable at this time. The department and college are working to improve our websites. Once the Chair is able to teach less, more effort will be made in recruitment especially at Salt Lake Community College (SLCC) and high schools, especially those with greenhouses.

Action Plan/Timeline: Efforts will be made in 2013-2014 to visit SLCC. In Spring 2014, visits to high schools, especially in Davis School District, will be made to build awareness of the new Botany course offerings at the Davis Campus, starting Fall 2014. In addition, these courses could be marketed to Early College students.

-We encourage plans for forming a General Advisory Committee and an Employer Advisory Committee for the department.

Response: The department agrees that Advisory Boards should be established in the department. We have already invited some employers and some alumni to serve.

Action Plan/Timeline: We plan to establish Advisory Boards and begin holding meetings in 2013-2014.

-We encourage further outreach to tribal communities and the local schools.

Response: We agree that further opportunities to work with tribal communities and local schools should be pursued. The Review Team offered suggestions for possible funding sources/contacts and we intend to investigate these and other grant possibilities.

Action Plan/Timeline: This has been and is an ongoing effort in the department. We will continue to seek out opportunities as they arise.