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www.sfu.ca/vpacademic**MEMORANDUM**

ATTENTION Senate **DATE** November 13, 2013
FROM Jon Driver, Vice-President, Academic and Provost, and Chair, SCUP **PAGES** 1/1
RE: Faculty of Science: External Review of the Department of Biological Sciences (SCUP 13-54)

At its November 6, 2013 meeting, SCUP reviewed and approved the Action Plan for the Department of Biological Sciences that resulted from its External Review.

Motion:

That Senate approve the Action Plan for the Department of Biological Sciences that resulted from its External Review.

Encl.

c: E. Elle
C. Cupples

A handwritten signature in blue ink, appearing to read "Jon Driver".



OFFICE OF THE VICE-PRESIDENT, ACADEMIC AND PROVOST

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www.sfu.ca/vpacademic**MEMORANDUM**

ATTENTION Jon Driver, Chair, SCUP **DATE** September 25, 2013
FROM Gord Myers, Associate Vice President,
 Academic and Associate Provost **PAGES** 1/1
RE: Faculty of Science: External Review of the Department of Biological Sciences

Attached are the External Review Report and the Action Plan for the Department of Biological Sciences.

Excerpt from the External Review Report:

"The Department of Biological Sciences at SFU has considerable research strengths and is in a position to carve out a unique niche intellectually. The Department is comprised of a group of dedicated and creative instructors and staff who support the instructional and research efforts."

Motion:

That SCUP approve and recommend to Senate the Action Plan for the Department of Biological Sciences that resulted from its external review.

Following the site visit, the Report of the External Review Team* for the Department of Biological Sciences was submitted in May 2013. The Reviewers made a number of recommendations based on the Terms of Reference that were provided to them. Subsequently, a meeting was held with the Dean, Faculty of Science, the Chair of the Department of Biological Sciences and the Director, Academic Planning and Budgeting (VPA) to consider the recommendations. An Action Plan was prepared taking into consideration the discussion at the meeting and the External Review Report. The Action Plan has been endorsed by the Department and the Dean.

SCUP recommends to Senate that the Department of Biological Sciences be advised to pursue the Action Plan.

***External Review Team:**

Gregory Kelly, Department of Biology, University of Western Ontario (Chair, Review Team)
 Christine Boake, Department of Ecology and Evolutionary Biology, University of Tennessee
 Richard Rachubinski, Department of Cell Biology, University of Alberta
 Andrew Bennet (internal), Simon Fraser University

Attachments:

1. External Review Report (May 2013)
2. Department of Biological Sciences Action Plan

cc Claire Cupples, Dean, Faculty of Science
 Elizabeth Elle, Chair, Department of Biological Sciences

Department of Biological Sciences

Simon Fraser University

April 3rd-5th, 2013

Submitted on May 27th, 2013

Reviewers: Dr. Gregory Kelly, Western University, (Chair of Review Team)
Dr. Christine Boake, University of Tennessee
Dr. Richard Rachubinski, University of Alberta
Dr. Andrew Bennet, Simon Fraser University

Terms of Reference:

- a) The quality of the unit's teaching programs is high, and there are measures in place to ensure their evaluation and revision.
- b) The quality of faculty research is high, and faculty collaboration and interaction provide a stimulating academic environment and to identify new or emerging areas that should be pursued.
- c) Department members participate in the administration of the unit and take an active role in the dissemination of knowledge.
- d) The environment is conducive to the attainment of the objectives of the Department. The Review Committee will assess the Department and comment on its strengths and weaknesses, on opportunities for change and/or improvement, and on quality and effectiveness.

Also:

- 1) Evaluate the Master's Pest Management and the Master's Environmental Toxicology professional programs with regard to their value and quality.
- 2) Recommend strategies for increasing the efficiency of course delivery, including faculty teaching schedules, course overlap and frequency of course offerings.
- 3) Evaluate the mix of faculty required to support excellence in both research and teaching. Recommend strategies to ensure appropriate support and development of sub-disciplines in biological sciences.
- 4) Evaluate the quality of the graduate program from the perspectives of student experience, enrollments, completion times/rates, financial support and areas of specialization, in relation to learning outcomes and student placements.

To Consider:

1. Programs

- structure, breadth, orientation and integration of the undergraduate programs, including the cooperative education program
- structure, breadth, depth and course offering schedule of the graduate programs
- graduate student progress and completion, and support for graduate students
- enrolment management issues at the undergraduate and graduate levels, including, for the former, majors and service teaching

2. Faculty

- size and quality of the faculty complement in relation to the Department's responsibilities and workload
- teaching, research and service contributions of faculty members, including the level of external research support

3. Administration

- size of the administrative and support staff complement, and the effectiveness of the administration of the Department
- adequacy of resources and facilities provided to support teaching and research, including library, laboratory, equipment, computing, and office space

4. Connection of the faculty within and outside the University

- the Department's concept and plan for teaching and research and its relationship with other units within the University
- relationship between the Department and the community
- relationship with alumni

5. Future Directions

- plans for future development of the Department are appropriate and manageable

Preamble:

The Department of Biological Sciences at SFU has considerable research strengths and is in a position to carve out a unique niche intellectually. The Department is comprised of a group of dedicated and creative instructors and staff who support the instructional and research efforts. Countering this are problems that vary from potentially disruptive, such as unbalanced workloads, to creating significant risks, such as the quality of the facilities. Below we present an analysis that is based on our discussions during our visit, as well as our reading of the excellent and detailed self-study and related documents.

Departmental Administration

Dr. Felix Breden has served as Chair for the past five years. Dr. Breden is about to step down from his position, to be replaced by Dr. Elizabeth Elle this summer. In 2006, at the time of the last review, the Department had 36.5 tenure-track faculty. This number has since dropped to 34, including two half-time appointments. An office staff, lecturers, an undergraduate advisor, and a group of laboratory technicians facilitate Departmental business. These individuals are all devoted to their work and to the students, and fulfill their job duties despite having heavy workloads.

Tenure-track Faculty Research & Teaching

The committee was impressed by the scope and depth of the research being conducted in the Department and notes that this research is of world-calibre. Dr. Breden was very proud of the publishing productivity of his faculty members and of their continuing success at garnering research grants. However he recognizes that given the current climate with the Canadian Tri-Council funding process, more large-scale, multi-PI-directed research grants need to be pursued. Many of the investigators have reduced teaching loads because they are funded through CIHR, HESP, or the Michael Smith Foundation, or they have been appointed as a UFA, NSERC, or CRC Research Chair. These secondments and awards are admirable and speak volumes to not only the high calibre and excellence of these researchers, but also to the dedication of those who have taken on significant administrative duties.

The areas of faculty expertise include ecology evolution, plant molecular biology, conservation biology, developmental biology and cell biology, and there are several "groups" within the Department. These include eBERG, FAB*-Lab, the Centre for Wildlife Ecology, E2O and the more recently formed Cell and Developmental Biology Group. The committee was impressed with the strength of each group, including productivity in publishing, the number of graduate students and postdoctoral fellows, and the amount of research funding they bring to the University.

Future of Research Groups. The E2O and CDBG groups expressed interest in establishing themselves as a centre or institute to gain better exposure, and it is the committee's view that the need is not critical or necessary. In fact, there already appear to be too many groups, and

when individuals were challenged why this is so, the most common answer was that many are historical in nature. We are in agreement with the Associate Chair, Dr. R. Ydenberg, who pointed out that self-identifying into groups has its benefits, but we also firmly believe it can often lead to insularity and exclusion when artificial barriers are established. In conversation with PDFs and graduate students, we felt that this was already the case and therefore would recommend that when (if) the time comes for major renovations to Departmental space, members doing like research be housed together, thus exposing trainees to different labs and their members. Graduate student and PDF training will benefit strongly by removing these artificial barriers. Given that the MBB split several years ago had fractious consequences leads us to strongly recommend not establishing any more centres in Biological Sciences, and instead members should self-identify into the groups that are already in place. These groups will be the requisite requirement for submitting RTIs and the anticipated group grants of the future.

Instruction. The asymmetry across the two divisions of the Department in terms of the numbers of undergraduate and graduate majors has resulted in difficulties in course offerings, as described later. The reduction in teaching availability due to the number of secondments, research chair awards, administration relief, etc. has placed a considerable burden on those carrying a full teaching load.

We were told that the number of graduate courses offered in the area of EEC satisfies the faculty in that area, but in the CDBG there are too few graduate courses. Given that CDBG has only 10 faculty members, we recommend a 3-year rota of course offerings and availability. Further, we recommend that a statistics course be made mandatory for Ecology, Evolution and Conservation graduate students, while a similar keystone course, possibly focused on techniques, be implemented for CDBG students. In order to increase research productivity by faculty members of the CDBG, measures must be implemented to decrease their teaching workload. Reducing undergraduate course enrollments may not be a viable option due to the large number of undergraduates in this stream, so the committee recommends placing caps on some upper year courses and/or restricting access of non-Biology majors to these courses. We also recommend allowing professors to “stack” their teaching because this would alleviate some of the problems; all faculty members whom we met welcomed our recommendation.

Our final recommendation to assist in strengthening the profile of the Department, while balancing workload and increasing research productivity, would be to target Biological Sciences’ next hire to the CDBG. Along these lines and in discussion with the Associate VP Research, Dr. N. Haunerland, and Dr. Elle, we proposed that if SFU, and Biological Sciences specifically, wants to have a greater presence on the world stage, it needs to find new scientific ventures and unique niches, rather than merely chasing what is being done elsewhere (and better) in Canada. Towards that end, the focus that we suggested involves capitalizing on the strengths and diversity of research models in the CDBG, and recommend hiring in the area of developmental epigenetics or epigenetic remodeling. The intent would be to purposely stay away from tying this in with human-related diseases, and instead focus more on how remodeling is linked to learning, plant health, evolution, behavioral imprinting, plant-parasite interactions, antibiotic and anti-fungal resistance, etc.

Facilities

All groups with which we met described the poor conditions of the research and instructional laboratories. Mr. B. Medford provided us with a tour. We noted ceiling and pipe leaks in labs, wood-clad fume hoods, inadequate bench space, cluttered aisles, electrical issues, and a lack of safety showers and eye wash stations. We were also told of problems associated with the HVAC systems, asbestos in lifting floor tiles, and power brownout issues. The committee was appalled by the state of the labs, and all felt that there is an immediate and pressing need to improve health and safety conditions. Beyond such urgent adjustments, "quick-fix" renovations are a poor use of funds. We urge the administration to give the highest priority to addressing the condition of the space assigned to Biological Sciences with a comprehensive, long-term solution.

Undergraduate Education:

Although the majority of the faculty and the majority of the graduate students are in the EEC stream, the majority of undergraduates self-identifies as being in the Cells, Molecules, and Physiology stream. This structural imbalance leads to difficulties in providing sufficient course offerings for all undergraduate majors in the Department. Nevertheless, the number of undergraduate students in all areas of biology is considered "healthy" and sustainable for a department of this size. Furthermore, the Departmental Undergraduate Curriculum Committee drew attention to the number of teaching awards received, and this is indicative of the quality of education being offered in Biological Sciences. Issues related to undergraduate curriculum are discussed both here and also in the section that covers instructional staff.

Of the 34 faculty FTEs, which include two half-time appointments, only half has full teaching loads. This creates problems of access to courses that are most acute for students in the lower undergraduate years, given the over 20% increase in total enrollment since 2005/06. Dedicated Departmental lecturers and teaching technicians take on some of this burden, but their numbers have not changed significantly from the time Dr. Breden assumed the position as Chair. We recommend that sessional lecturers be hired to reduce the strain on the research and teaching faculty members and we note other mechanisms (core curriculum development and hiring into the CDBG program) that will also serve this purpose. Teaching overload appears to be more of a problem in one of the two major streams in the Department. This will be addressed later.

We met with 10 undergraduate students, representing about a 50:50 split between those in the Cells, Molecules and Physiology stream and those in the Ecology, Evolution and Conservation stream. The students' overwhelming view was that the lecturers and course technicians were dedicated and offered a valuable learning experience, but the students were troubled by course availability, or lack thereof, especially in their 4th year. Some upper division courses were being offered in the same time slots, which prevented students from taking them in the same term. We were also informed that students encountered difficulties in registering for courses given by other departments. When asked if they perceived that students from outside the Department had similar issues in Biological Sciences, they did not think there was a

problem since Biological Sciences was willing to take these students. When asked why students do not finish in the usual 4-year timeframe, some said it was the inability to get into Departmental courses, while all said it was the co-op program, which was highly praised by those students involved. As mentioned earlier, the suggestion was made to make class sizes smaller by limiting enrollment in particular classes, specifically those in the Cells, Molecules, and Physiology stream. For those in the Ecology, Evolution and Conservation stream, the students felt that there was a need for courses that taught applicable skills, such as R, GIS and modeling. The solutions to some of these problems are tied up with the problems of the workloads of faculty members, and are addressed in detail in the faculty sections of this document.

Writing Credits. There were also suggestions made to improve the quality and consistency of the writing credit courses. For some courses, *e.g.* Genetic Analysis, there is a writing credit in some semesters and not in others. For consistency, the committee recommends that the same course have the same requirement regardless of the semester. More feedback to students on how to improve their writing skills is also needed for any course that offers a writing credit.

Statistics Courses. Students expressed concern regarding the overlap between Stats 302 and Stats 201. Students in the Cells, Molecules, and Physiology stream felt they would be better prepared if they had Stats 302, but those in the Ecology, Evolution and Conservation stream expressed an interest in taking Stats 403 instead of Stats 302.

Laboratory Courses. In regards to lab courses, the majority of students agreed that there is a need to re-evaluate the weight of lab courses, assigning either 3 or 4 credits. Overall, however, students felt they would like more lab experience in the lower level courses, but were satisfied later on in getting into labs to do volunteer and paid research. They thought, however, that the NSERC USRA program could be better promoted.

Co-op Program. Students spoke highly of the co-op program, as did Dr. Breden and members of the co-op staff, Mr. S. Billings, Ms. G. Litchfield and Ms. B. Badjero, who noted the placement success rate following graduation.

Undergraduate advising. The undergraduate advisor, Ms. E. Kirkwood, echoed many of these points and noted that many of the specialty 4th year courses were offered only every other year. When asked about workload and given the ever-increasing enrollment, it was obvious that Ms. Kirkwood was concerned about overload, especially at registration time.

Finally, the committee considered two points to be troubling. The first was the fact that the majority of students, regardless of whether or not they opt for the co-op program, fail to finish within a 4-year timeframe. In regards to not gaining access to upper level courses, the committee might recommend improving the structure of the programs, *i.e.*, knowing which courses are available over a 3-year timeframe and/or having alternative courses that can be substituted as suitable replacements. We also felt, however, that some of the onus be placed

on students to follow a much more regimented program. The second point is surprising and at least as troubling: the overall apathy that undergraduate students showed towards non-academic activities. We were told the undergraduate departmental society was highly undersubscribed, and attempts to attract students to social events were a “miserable failure”. It was generally accepted that the problem was the fact that SFU is a commuter university, and nothing could be done to change student apathy for these sorts of after hour events. We suggest hosting these events during “school” hours and to solicit the Department, faculty and alumni for funds to host biology-related public interest talks and research seminars. In fact, inviting former alumni to these events is likely going to increase the profile of the Department.

Graduate Education

The Department boasts a very healthy graduate program, and the number of students conducting research in all areas of biology has increased by 12% since 2006. Dr. Breden noted that one of the Department’s strengths is its graduate program, and over the three days of our visit many parties, including Dr. Elle, the Chair-Elect, echoed these sentiments.

The committee met with eight graduate students, five in the M.Sc. program and three in the Ph.D. program. Surprisingly, these students were all in the Ecology, Evolution and Conservation stream, with none from the area of Cell and Developmental Biology. We were also surprised by the fact that only around 25% of the graduate student body is in the area of Cells, Molecules and Physiology. Nevertheless, with the exception of criticisms of workspace conditions, comments from students were mostly favorable, noting a strong sense of peer-driven collegiality.

Advising. Some students expressed communication and expectation problems with their supervisors and advisors, and we would recommend that measures (such as a student-advisor contract) be put in place to document and deal with these issues. Likewise, we feel there is a need for more gender-balanced advisory committees and to, for lack of a better word, mix up or diversify membership on these committees, which relates to breaking down what some students perceive as “barriers” between groups in the Department. We also recommend enforcing the regulations regarding having committee meetings on a regular basis, and we would like to recommend that the Departmental Financial Officer and/or the Chair have signing authority on grants to ensure students are always paid in a timely manner. We also recommend that a graduate student handbook be compiled and updated on a regular basis, and that a dedicated website be established.

Curriculum. Recommendations put forth by the students were to make BISC 800 mandatory and to have mandatory orientation sessions offered each term, and we concur. Course availability, especially for the professional programs, was considered poor, and course requirements are not well defined. We also recommend that a graduate level course in statistics be implemented with input from more than one faculty member, and that graduate course offerings over a 3-year period be made available on the website.

Special Degree Programs. Members of the committee met with faculty involved in two unique programs offered in the Department. The Master's of Environmental Toxicology program hosts 17 graduate students, whose theses are primarily course-based. The Director, Dr. C. Kennedy, presented details of the program, outlining the current faculty members who participate and those who contributed in the past. Dr. Kennedy suggested that although two hires in this area were needed to maintain the program, only one was essential. We understand from Dean Cupples that a toxicology position is high on the list of new hires in Biological Sciences. We also understand that the previous Department review committee recommended a hiring in this area. We note that the success rate of gaining employment either before or shortly after graduation from the program is excellent, and only a few departments exist in Canada that offer such a professional program. Nevertheless, we are reluctant to recommend hiring in this area. Our major concern is that environmental toxicology is not a perceived strength of the Department. The faculty members involved in the program are well established investigators publishing in impact journals, but in our opinion they do not constitute a critical mass, nor would a critical mass develop with one additional hire. Furthermore, the Strategic Planning Committee also voiced reservations regarding hiring in this area, and we subsequently learned from Dean Cupples that Biological Sciences was not obligated to carry through with the hire in toxicology. By no means do we recommend cancelling the program. Instead, we recommend that the program become more incorporated into the Ecology, Evolution and Conservation stream, which is certainly a recognized strength and one already with a critical mass of excellent investigators.

Members of the committee also met with those involved in the Master's degree in Pest Management. When compared to Dr. Kennedy and the MET program, we sensed somewhat less enthusiasm for this program from its members. Although there was discussion regarding the need for hires, it was unclear what specific areas were to be targeted. A hire of an agricultural economist jointly with the business/economics department was suggested, but we the committee felt this would only serve to weaken the strengths in the Department, not to mention that hires between two departments seldom work. Student placement following graduation from the Pest Management program is very good, but funding for students seemed to be a major issue, and the discussion focused on finding more creative ways to attract funding from private and government sources. The idea of overlap with FENV and other faculties/departments also reduced our enthusiasm to support the program. In our opinion, and because there was no strong justification for a new hire, we felt that the Department would benefit from either discontinuing the program in its entirety or rebranding it to bring it more in line with the Ecology, Evolution and Conservation stream.

Student finances. There is major dissatisfaction regarding graduate student stipends, especially in comparison to those in other parts of Canada. In addition, in some cases the financial agreement between supervisor and student was not transparent. The Departmental Graduate Studies Committee informed us that they were well aware of the stipend shortfall, and measures are in place to increase the stipend incrementally to \$21,000. Nevertheless, given the geographic locale and economic climate of the area, and the fact that students must pay tuition costs out of this stipend, the committee felt the amount, in comparison to other

universities in Canada, is too low.

As a means to improve TA training and support, it was suggested that a “merit-based” TA budget be implemented from funds from Fraser International College. We are in agreement that TA duties from course to course must be equitable, and some means to track the amount of time spent in the lab, prep time, marking, etc., must be formalized to ensure TA workload is equivalent in all BISC courses.

At a meeting with Dean Parkhouse we suggested that application costs for the graduate program be funneled directly back into the program and used for travel awards or to host graduate-student-sponsored seminars. The topic of too many graduate students also came up in discussion, but it would be imprudent to suggest a cap, especially given NSERC’s mandate to train HQPs. Finally, the committee recommends the need to have a member of the graduate and undergraduate committees act as an assistant to the chairs of said committees, where the assistant is of the opposite gender to that of the chair. Having this policy in place would ensure students, regardless of gender, would always have an avenue to draw attention to and discuss sensitive issues.

Postdoctoral Fellows

Representatives from different labs expressed similar concerns regarding their tenure at SFU. All were in agreement that there was a lack of interaction between PDFs in the Department. Space was also mentioned, and again it was a health and safety issue. There was, however, no consensus when asked if separate offices for PDFs were necessary. Another common complaint was the lack of information available to incoming PDFs. We were told the “tips and tricks” sheet needs to be updated, and we recommend that a handbook, not unlike the one proposed for undergraduates, be organized and updated on a regular basis. We also recommend the need for a better liaison between PDFs and graduate students. The latter group will greatly benefit from the life skills already learned by their more senior colleagues.

Professional development. PDFs expressed interest in the opportunity to teach. The committee agrees that this is a very good idea, as well as a necessary skill to acquire if they intend to pursue an academic position. We commented that acquiring good teaching habits comes only from practice and mentoring, but to be cognizant that it can usurp precious time away from research and manuscript writing – absolute prerequisites to get on the short list of potential hires. We therefore recommend that PDFs be allowed to do limited lecturing, e.g. 5 lectures, and that they be evaluated using the same score sheets as those used for faculty member evaluations. These metrics will be an invaluable addition to their c.v.

Finally, PDFs expressed concern that unlike students, they were not entitled to a bus pass or subsidized public transit. In fact, one even mentioned he often considered saving money by working from home. This, and the need to have an office and personnel that deal specifically with PDF issues, was brought up in conversation with Dean Parkhouse. Thus, some creative thinking is required to meet the needs of these individuals who we now feel contribute

to the individual PI and his/her research operation and little to the Department as a whole.

Teaching Faculty & Lab Technicians

The teaching faculty and lab technicians noted the collegiality between groups and that they enjoy the autonomy in their courses. They also reported that they receive considerable support from the Department, and we as a committee felt that the overall sense was that the Department in general is greatly concerned about teaching. Several requests by the teaching faculty, however, were brought to our attention. One was the need for improved curriculum planning. A case in point was BISC 101 and the repeated efforts to reform the course. Coordinating DUCC, CPG and individual faculty members would improve communication. The teaching faculty presented their own recommendations for the Chair-Elect, and we would suggest that these details be brought directly to Dr. Elle's attention.

Workload was also on the minds of the lab technicians, who were overtly loyal in their support of the Department and passionate about student needs and undergraduate education. They were troubled nevertheless by the loss of positions, the reduction in the number of lab courses and the fact that all are working at maximum, often donating time to get the job done. The committee was sympathetic to their needs and would recommend that they not "train" TAs, which is of course the responsibility of the course coordinator. We also heard that when some labs exceeded the period allotted to them, the TAs had to shut things down because the technician, having worked the prescribed number of hours, was not present to do so. Thus, there is a definite need to downsize some labs. In addition, these technicians face unpredictable workload issues, and there does not appear to be a mechanism in place to cover someone's duties when one or more people are off work. We understand there is a union issue, but we recognize that a continuance of the current system will lead to an eventual total breakdown.

Another request was made in regards to the imminent retirement of Mr. S. Halford, the teaching lab and museum technician. We were told that undergraduate courses use museum specimens and that the facility houses specimens from the Burgess Shale, a national treasure that the committee strongly feels needs "protection" when Mr. Halford retires. Dr. Bennet had suggested that since the specimens are used for Outreach programs, the Department should seek a half-time position from "Science in Action." The other committee members were in agreement and had one other recommendation pertaining to Dr. Dave Carmean, the departmental computer systems consultant. The committee felt that Dr. Carmean was being underutilized and his talent could be best served in digitally cataloguing all the specimens. When approached, he was agreeable to the undertaking. We also suggested creating a museum website that could be used online for teaching and Outreach purposes, as well as showcasing specimens outside the Department's main office, similar to what the Chemistry department has done with the Periodic Table.

The teaching faculty members were fully aware of the push for Biological Sciences, MBB and BPK to plan a core "Life Science" curriculum that would satisfy the needs of students in

years one and two. There was, however, concern that restructuring would alter their status as members of Biological Sciences. Overall, it was our impression that most members of Biological Sciences are amenable to adopting this core, and we heard that informal dialogue between departments has begun. Despite this, we perceived that the teaching faculty was not being fully engaged in the process, and since they are quite proactive on this issue, we would recommend that any planning of a core curriculum involve representatives from the teaching faculty and technicians. We strongly recommend that the development of this core curriculum be initiated as soon as possible, as it will likely become a major factor in alleviating the teaching overload in lower level courses.

Finally, the teaching faculty requested a stronger presence in Departmental decision-making policy, specifically that one of their members serve on the Strategic Planning committee. We concur.

Office Staff

Details of the meetings with individuals not considered office staff, *i.e.*, technicians, undergraduate advisor, graduate program assistant, computer systems consultant, *etc.*, have been covered elsewhere. Essentially, we found that the office staff had few complaints, but workload was an issue, and they had devised a mechanism by which members, including the receptionist, Mr. M. Cheng, would assist others at certain times during the semester. The committee felt that this was inadequate and would put undue stress on members, especially if a member was unable to attend to his/her duties during these periods. We recommend that an assistant be hired not only to help out with some of these duties, but also to contribute to the graduate program, since one person responsible for tracking 150+ students was deemed insufficient. The office staff also recommended that the appointed Chair and members of the graduate program serve a 3-year instead of the current 2-year term, and we thought this was a logical request based on our experiences elsewhere. In addition, we thought more emphasis should be placed on cohort building between office staff and faculty. Almost the entire Department felt that the office staff was performing an admirable job and was an integral part of the undergraduate, graduate and research programs. We felt there was room for improvement, however, by having regular staff (and this includes all staff) appreciation days, highlighting their achievements and accolades. We also recommend that offices for the chairs of the graduate and undergraduate program be placed in the general office, and to establish a workload committee for the staff and tasking them, along with the Chair, to annually review job descriptions. This committee would also be charged with developing and implementing policy regarding managerial accountability, and to bring complaints, should they arise, directly to the Chair or the Associate Chair.

Summary

The overall administrative system at SFU gives a great deal of financial and academic authority to departments, resulting in upper levels of administration that are weaker than at many other Canadian universities. The campus appears to be in the process of shifting to a situation in

which the Deans and other higher officers have more power. This shift could make it easier to solve some problems, such as the complexities of undergraduate instruction and the decrepit nature of some of the facilities. Any such changes will need to be made with sensitivity to the stresses that arise when an administrative structure is revised.

Specific Recommendations

- Reduce workload in areas noted above
- Replace the facilities
- Integrate MET and MPM into EEC
- Hire in CDBG
- Hire sessional instructors
- Develop a core curriculum
- Work on the 4-year undergraduate graduation rate
- Rethink the roles of laboratory and support staff to streamline workload

Acknowledgments

We greatly appreciate the enormous effort that went into compiling the vast amount of data and facts for the background on the Department and the University. Special mention goes to Drs. Felix Breden, Chair, and Elizabeth Elle, Chair-Elect, who we understand did the lion's share in preparing the Self-Study document for this review. In addition, we would also like to thank Ms. Bal Basi, Office of the Vice-President, Academic, for making the travel arrangements and hotel accommodations and for serving as our contact person. We greatly appreciate the trouble Ms. Basi went through to make our trip very enjoyable. We would like to acknowledge also Ms. Tiina Klasen, whose impeccable organization skills kept everyone on a tight schedule, and for going out of her way to make our visit quite memorable. Finally, we would be remiss if we did offer a sincere thank you to all the faculty, staff, postdoctoral fellows, research associates, graduate students, research assistants and undergraduate students, who took the time to speak with us and/or provide information that has helped us to craft this review.

EXTERNAL REVIEW – ACTION PLAN

Section 1 – To be completed by the Responsible Unit Person e.g. Chair or Director

Unit under review	Date of Review Site visit	Responsible Unit person,	Faculty Dean
Biological Sciences	April 3-5, 2013	Elizabeth Elle	Claire Cupples

***Note:** It is not expected that every recommendation made by the Review Team be covered by this Action Plan. The major thrusts of the Report should be identified and some consolidation of the recommendations may be possible while other recommendations of lesser importance may be excluded. Should an additional response be warranted, it should be attached as a separate document.*

1. PROGRAMMING

1.1 Action/s (description what is going to be done):

1.1.1 Undergraduate:

- Address concerns about course access and time to degree completion by:
 - a. Improving communication regarding our normal 2-year cycle of course planning.
 - b. Determine mechanisms to improve orientation of first year students to SFU and the Biology program. Improved orientation should address long completion times when they occur for reasons other than student uptake in our excellent Co-Op program.
 - c. Improving course availability in our popular Cells, Molecules, and Physiology stream. We will determine if we can streamline our curriculum to improve availability of essential upper-division offerings with no additional hires, and whether hiring sessionals or a lecturer to assist with the teaching of lower division courses could improve availability of research faculty to teach in the upper division.
 - d. Working with other Life Sciences Departments to improve and streamline the delivery of the lower-division core and increase cross-Department access to upper-division courses.
- We currently include student representatives from the Biology Student Union (BSU) on our Undergraduate Curriculum Committee, co-organize socials with the BSU, and consulted with the BSU during a recent lecturer hire. We will continue to engage with undergraduates in the BSU and will consult with them about other ways to support their endeavors.

1.1.2 Graduate:

- We commit to ongoing review of our unique professional Master degrees in Pest Management (MPM) and Environmental Toxicology (MET), to ensure these degrees are of the highest quality.
- We will continue to improve our graduate curriculum, and among other actions will consider making BISC 800 (our “Basic Skills for a Career in Science” course) mandatory and integrating aspects of our orientation program within it, and implementing a

core course structure specific to each of our two broad subdisciplines (Ecology/Evolution/Conservation and Cell/Development).

- **We will improve advising and student-supervisor relationships in the Department. This will include consideration of how to enhance ongoing efforts to communicate policies, procedures, and mechanisms for dealing with conflict with our students.**
- **The ERC noted that our salaries for graduate students are in line with other universities, but given the cost of living in Vancouver, and the requirement that students pay tuition from their stipend, the amount was too low. At the request of our graduate students, the Department will investigate, with the upper Administration, the possibility of tuition reduction or remission for graduate students.**

1.1.3 Post-doctoral:

- **Determine how we can better integrate PDFs into the Department, and consider their professional development alongside that of our graduate students.**

1.2 Resource implications (if any):

- **The External Review team suggested we needed to hire more sessionals to address imbalances in our undergraduate program and uneven workloads of faculty. Should an analysis of our program (and possible streamlining/reconfiguring) suggest we need additional teaching support, we argue that students would benefit more by having an additional lecturer as a permanent member of our faculty, rather than sessionals. Either way there are clearly resource implications if additional instructors are needed.**
- **Ongoing discussions with other Life Science Departments regarding the undergraduate curriculum have no resource implications beyond those addressed by the INSPIRE program of the Dean of Science.**
- **Changes in the graduate curriculum should have no major resource implications, and neither should any efforts to better integrate and engage students and postdocs.**

1.3 Expected completion date/s:

- **Some actions (communication-related for instance) can happen immediately, and in fact have been ongoing.**
- **Revision of the curriculum will have a timeline of 2-3 years at the graduate level, and 3-5 years at the undergraduate level.**

2. RESEARCH

2.1 Action/s (what is going to be done):

- We are a broad-based Biology Department, with some overlap in teaching and research focus with other, more narrowly defined units on campus. Some recommendations of the External Review Committee suggest they did not understand the breadth of our mandate. We will clarify and better articulate our identity as a Department.
- The Department strongly supports our current hiring plan, which prioritizes faculty renewal in Toxicology, followed as soon as possible with our planned hire in Development.
- We will evaluate and implement mechanisms to raise the profile of our small but excellent Cell and Developmental Biology group.
- Facilities are in dire need of replacement, as they are inadequate to support modern biological research. We will continue to work with the Administration to find ways to fund facilities renewal.
- We recognize that there is an imbalance in the teaching load between faculty associated with our two undergraduate streams. This imbalance can have an impact on research productivity, primarily in our Cell and Developmental Biology Group. We will evaluate faculty teaching workload as associated with undergraduate enrollment, and consider solutions to any imbalance. Solutions could include any combination of changes in the faculty complement, stacking of teaching, streamlining of the curriculum, and collaboration with other Life Sciences Departments to improve course access and curriculum delivery.

2.2 Resource implications ((if any):

- Clearly a new or renovated building has major resource implications and it is impossible to suggest a completion date.
- As noted under programming, the hiring of a lecturer or sessionals has resource implications (salaries). Stacking of teaching does not have resource implications, nor does it have any cost for the curriculum if implemented wisely.

2.3 Expected completion date/s:

- Clarification of our Departmental identity is ongoing but we expect new focus prior to the midterm report.
- The implementation of our current hiring plan is ongoing. The Environmental Toxicology hire was approved in 2013 and we have struck a search committee.
- Changes to raise the profile of our Cell and Developmental Biology Group: 1-3 years to decide on actions (such as whether we should form a Centre for Cell Biology) and implement them.
- Renovations are outside of the Department's control and the timeline cannot be predicted.
- A careful analysis of our curriculum and our teaching needs and how we can address imbalance between undergraduate streams in faculty workload will occur over the next 1-2 years.

3. ADMINISTRATION

3.1 Action/s(what is going to be done) :

- We will implement changes in our Appointments Committee structure to give our teaching faculty greater voice in Departmental decision making.
- We will review position descriptions of office staff (see “Working Environment”) to better understand workloads. If warranted, we will make the case for either re-configuring job descriptions or hiring of additional staff.
- We have begun consultation with our technical staff regarding workload, and are actively exploring ways to address occasional workload issues that are consistent with union regulations.

3.2 Resource implications(if any):

- None for Appointments Committee.
- If more support staff are determined to be required after a careful review, this has resource implications.

3.3 Expected completion date/s:

- 1 year to a) update our Constitution and b) complete a workload review for both office and technical staff.

4. WORKING ENVIRONMENT

4.1 Action/s(what is going to be done) :

- The review strongly recommends major renovations to improve our physical space. The condition of our facilities negatively impacts our teaching and research, and aspects of the deterioration cause health and safety concerns.
- As noted under “Administration”, we will review the position descriptions and workload of office and technical staff to ensure they are reasonable and equitable. We will be proactive about instituting changes should they be required.
- Continue and expand our tradition of celebrating successes and contributions by all members of the Department.

4.2 Resource implications(if any):

- Clearly renovations are costly.
- If a review of position descriptions and workloads suggests we are under-staffed, there will be resource implications associated with new hires.

4.3 Expected completion date/s:

- Physical space: unknown
- Review of workloads: 1 year

5. FACULTY RENEWAL

5.1 Action/s:

- The Department strongly supports a hire in Environmental Toxicology, the top priority of our hiring plan. We disagree with the External Review Committee that we change our hiring priorities, especially given their acknowledgement of the strength and profile of our Masters in Environmental Toxicology program.
- We agree that we should quickly move ahead with our second planned hire in Development, as supported by the External Review Committee, as there are clear research and teaching benefits for doing so.


5.2 Resource implications(if any):

- Faculty renewal in Toxicology has already been approved by SFU, so no additional resource implications.

5.3 Expected completion date/s:

- We expect to begin the hiring process for an Environmental Toxicologist in summer/fall of 2013.

The above action plan has been considered by the Unit under review and has been discussed and agreed to by the Dean.

Unit Leader (signed) 	Date 17 Sept 2013
Name Elizabeth	Title Dept. Chair

Section 2 - Dean's comments and endorsement of the Action Plan :

The Department of Biological Sciences is the largest department in the Faculty of Science, and arguably the one with the most disciplinary breadth. As the reviewers point out, and the department acknowledges in its response, the need to balance cell and developmental biology (CDBG) disciplines on the one hand with ecology, evolution and conservation (EEC) areas on the other presents challenges for both research and teaching. An additional challenge is the presence of two other life science departments in the faculty: Molecular Biology and Biochemistry (MBB), which split off from Biology 13 years ago, and Biomedical Physiology and Kinesiology (BPK), a fairly recent addition to the faculty. Among them, these three departments produce about 70% of our undergraduate science degrees. The department is to be congratulated on its ability to maintain internal harmony, and on the extent of its collegial interactions with other departments. Nevertheless, the department is under some strain as it contemplates rebalancing its undergraduate curriculum in consultation with other units, while making decisions about future faculty hires that also have an impact on graduate training and research.

Specifically, one of the biggest challenges facing the department is the fact that undergraduate students prefer to study CDBG subjects while graduate students are in EEC fields. Thus, I endorse the department's plan to first address the gaps in the CDBG curriculum by a combination of curriculum revision and collaboration with both BPK and MBB, before contemplating changes in faculty complement. My office has offered substantial financial and personnel assistance to facilitate the curriculum revision process. At the same time, I welcome proposals from departments, including Biology, on how to adjust teaching assignments across the Faculty to ensure equity for faculty members and course access for students.

Professional masters programs, such as the MPM and MET, are traditionally popular with students but poorly supported by faculty members. I will work with the department to find a means to maintain these more applied programs without weakening the more academically oriented MSc and PhD programs.

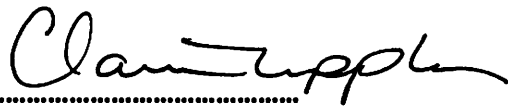
The sorry state of the department's infrastructure is a major concern. This past year, the Faculty has assisted with the purchase of new lab and field equipment, the financing of essential renovations to first year labs, and safety upgrades to the Biology Office. However, as everyone recognizes, these measures are stopgap. Thus, the Dean's Office is working with Facilities Management and the department in planning for substantial renovations, or a new life sciences building – a high priority for the university.

Some of the issues faced by Biology such as course availability, time to degree completion, student advising, graduate student stipends, attracting excellent undergraduate and graduate students, etc. are university- and/or Faculty-wide. In consultation with departmental chairs, the Dean's office is making an effort to address all of these issues across the Faculty; staff reorganization in the office over the last year has resulted in more support for student advising and recruitment, and IT support in particular.

In summary, the Department of Biological Sciences has tremendous strength in both research and teaching. Its recent history of collegiality in problem solving gives me confidence that it will find solutions to the issues identified by the external appraisers, and will continue to build on its strengths.

Faculty Dean

...Claire Cupples.....



Date

.....16 September, 2013.....

Additional Response to the External Review of Biological Sciences, 2013

Events during this past year have been hugely helpful for the Department of Biological Sciences, as the External Review process motivated us to have a retreat where we had a very collegial discussion of our goals, to hold several meetings of Departmental committees and of the entire Department to evaluate our strengths and weaknesses, and to prepare a self-study document that identified our many strengths as well as areas where we are working to improve. We looked forward to receiving the External Review Report (ERR) and have now had a chance to discuss it and to vote on an action plan (Departmental meetings June 17th and July 29th).

Although there were suggestions of merit in the ERR, the Department in general was disappointed with the document. In many cases, the suggestions were vague, and in others, although the suggestions were quite specific, they did not accurately reflect the conversations they were meant to reflect, according to Department members who were present. False statements include the suggestion that our Strategic Planning Committee “voiced reservations” about hiring a Toxicologist, the statement that a priority hire in Pest Management would be one that is shared with Business, and the conclusion that the issues discussed with the technicians indicate our lab system is headed for “eventual total breakdown”. The ERR additionally suggested that our professional Master’s degrees (MET, Master in Environmental Toxicology, and MPM, Master in Pest Management) should be discontinued or brought in line with our Ecology, Evolution, and Conservation undergraduate stream, and that the committee was concerned about the “idea of overlap” with the Faculty of the Environment. These statements demonstrate a fundamental lack of understanding of the scientific basis or strengths of the MET and MPM, in which research spans the breadth of Biological Sciences, from molecules to ecosystems.

Perhaps because the External Review Committee failed to understand the nature of our professional Master’s degrees, their report recommended a change in our hiring priorities. The ERR recommended that we not hire in the area of Toxicology at all, but instead proceed to what was our second priority, Developmental Biology. This recommendation was made despite the indication in the ERR that the External Review Committee considers the MET and MPM to be strong in both the caliber of associated faculty and the rate of employment of graduands. A Toxicologist has been a priority hire for our Department since our last External Review in 2007. We once again discussed our hiring priorities at our June 17th 2013 Departmental meeting, followed by a web ballot, in which the Department indicated strong support for our current hiring plan. Specifically, the Department advocates hiring a Toxicologist immediately, in support of our MET program, as well as other aspects of our undergraduate and graduate programs. We agree with the ERR recommendation that we should then quickly move forward with another hire in support of our Cell and Developmental Biology Group, specifically in the area of Developmental Biology.

Elizabeth Elle
Chair