Implementation Report on the 2017-2018 Cyclical Review of the programs in the Department of Biology

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INTRODUCTION

This is the first implementation report for the Department of Biology cyclical review that took place in 2017-2018. For each recommendation, the full language from the External Reviewers' Report has been included, along with the corresponding information about implementation from the Final Assessment Report. For each recommendation, the unit has provided an update on the progress or action made toward the implementation of that recommendation, followed by comments from the relevant dean(s) and the Program Review Sub-Committee. Taking into account the updates provided by the unit and the comments from the dean(s), the Program Review Sub-Committee will review the report and determine if all recommendations have been implemented satisfactorily or if a subsequent report will be required.

RECOMMENDATIONS PRIORITIZED FOR IMPLEMENTATION IN FINAL ASSESSMENT REPORT

Full Recommendation from External Reviewers' Report: Establish tools and metrics to assess learning outcomes in BA and BSc programmes.		
Recommendation to be Implemented (from Final Assessment Report)	**Responsibility for Implementation**	**Anticipated Completion Date**
Recommendation #1: Establish tools and metrics to assess learning outcomes in BA and BSc programmes.	Department	May 2020

Unit Update: The department still agrees that this recommendation is important, but progress has been modest for several reasons. The report of the task force formed by the Canadian Council of University Biology Chairs was presented in Fall 2019, and provided an overview of the structure, content and learning outcomes of almost 40 Biology programs from across the country. The report was useful in that it provided evidence that our programs align very well with other Biology programs across Canada. Although the report identified common themes in program-level learning outcomes, it did not discuss best practices or provide recommendations related to assessing the learning outcomes. Also in the Fall of 2019, the department undertook a series of curriculum changes beginning with 1st and 2nd year courses. These changes took effect in Fall 2020, and involved converting a required 2nd-year course (BI296) into a required 1st-year course (BI196), and introducing a new required 2nd-year course to fill a gap in the curriculum (BI206 – Ecology). Introducing a new 2nd year Ecology course necessitated additional changes to 300- and 400-level courses for which the new BI206 – Ecology course became the pre-requisite. Subsequently, a series of other changes to 300- and 400-level BI courses were proposed in Fall 2020 for

implementation in Fall 2021 (a suite of changes to the Applied Water Science program were proposed at the same time; although that program is not covered by this review, the changes are relevant to BI programs because it is common for BI students to take WASC courses). These changes resulted from mini-curriculum mapping exercises that were completed by small groups of faculty who teach courses related to Biology's three Concentrations (Micro, Molecular, Cell Biology & Genetics, Ecology, Evolution & Biodiversity, and Anatomy & Physiology), and involved shifting content between courses, and merging other courses to minimize duplication/overlap of content. The final phase of changes will be proposed this fall for implementation in Fall 2022, and will involve revising how some lab content is delivered in upper year courses. We will also likely re-visit the decision to convert BI296 into BI196, as this change has proved complicated and challenging, in particular for students who transfer into Biology after first year.

From the department's perspective, an important first step in examining the tools and metrics used to assess learning outcomes is to generate an updated curriculum map for the program. We undertook a curriculum mapping exercise several years ago (and some "mini-mapping" exercises at the Concentration level more recently, as mentioned above), but given the series of curriculum changes described above, we felt that it was important to fully implement the changes and have the experience of teaching the revised courses/curriculum at least once before re-visiting the curriculum map. Our plan to generate an updated curriculum map in spring 2021 was derailed by the pandemic; by the end of the Winter 2021 term, no one in the department had the energy to undertake this task. Furthermore, the timing didn't seem right given the final suite of changes that will be proposed this fall. Therefore, the curriculum mapping exercise has been postponed until Spring 2022. Once the curriculum mapping is complete, we will be in a better position to confirm our Program-Level Learning Outcomes, and then begin to examine how best to assess those outcomes, all of which will take time to complete. Therefore, while we continue to agree that this recommendation is important, have made some progress and intend to follow-through, we don't anticipate being in a position to complete it before spring 2023 at the earliest, at which time it will help to inform the next periodic program review.

FOS Decanal Comments: The Department has taken this recommendation very seriously and consequently embarked on a thorough review of its programmes to develop the tools and metrics it will use to assess future success. Whereas progress has been halted due to the pandemic, they are committed to this exercise and I am confident that the task will be completed within their proposed timeframe. Hence, no further reporting is required.

Program Review Sub-Committee Comments: The committee appreciates the thoroughness of the department's response, outlining the actions that have been taken toward the implementation of this recommendation thus far, as well as the pandemic-related challenges that have slowed further progress. The committee encourages the department to complete its curriculum mapping and outcomes assessment planning in advance of its next cyclical review, but is not requiring further reporting on this recommendation. A Curriculum Developer will soon be joining the Quality Assurance Office, and once hired, this person could support the department in its curriculum work.

Full Recommendations from External Reviewers' Report: In light of increasing enrolments in the Biology programmes, the department is encouraged to raise entrance requirements for the Honours BSc and BA.			
Recommendation to be Implemented (from Final Assessment Report)	**Responsibility for Implementation**	**Anticipated Completion Date**	**Additional Notes**
Recommendation #2: In light of increasing enrolments in the Biology programmes, the department is encouraged to raise entrance requirements for the Honours BSc and BA.	Department of Dean of Science Office	May 2019	Department should continue to work alongside the Dean of Science Office in examining entrance requirements for the program, including minimum cut offs.

Unit Update: As indicated in the department's original response, the average cut-off was raised 1 percentage point that year. Interest and registration in Biology programs has remained strong and steady, and intake into Biology programs is typically very close to target, indicating that current entrance requirements are appropriate. The total number of students admitted to Biology programs over the last 3 years (2019, '20, '21) have been 135, 135 and 99. It is also important to note that more students now enter Biology programs after 1st year, in large part due to the introduction of Core Sciences. In the past, many students would receive alternate offers to the BA Biology program if they weren't admitted to their first-choice program. Now students are offered alternative admission to Core Sciences; many switch to a Biology program in 2nd year, but this change has led to lower and more variable 1st-year intakes into the BA Biology program in particular. The total number of students registered in all Biology programs in all years as of August 2021 is 604. The department remains open to the possibility of revisiting entrance requirements in consultation with the Dean of Science on an on-going basis, but is also keenly aware of keeping our cut-off(s) comparable to Biology programs at other universities. We feel comfortable with our current requirements, given the steady and strong number of students in our programs, and therefore feel that further adjustments are not required at this time.

FOS Decanal Comments: The Department immediately took action to address this recommendation, and they have now established a suitable position for student entry into their programs. It is also apparent that they will continue to pay attention to this issue in the future. This recommendation has been completed.

Program Review Sub-Committee Comments: The committees appreciates the context provided by the department as to how and why it has approached the implementation of this recommendation. It is clear that the program admission requirements is something that both the department and dean are paying attention to, and so for reporting purposes, this recommendation is considered to be completed.

Full Recommendations from External Reviewers' Report: In light of the growing success of the graduate programmes in Biology, the department is encouraged to raise minimum entrance requirements for MSc.			
Recommendation to be Implemented (from Final Assessment Report)	**Responsibility for Implementation**	**Anticipated Completion Date**	**Additional Notes**
Recommendation #3: In light of the growing success of the graduate programmes in Biology, the department is encouraged to raise minimum entrance requirements for MSc.	Department, Dean of Graduate and Postdoctoral Studies	May 2019	Examine past GPAs for entering students to determine if any changes are warranted.

Unit Update: The department remains open to examining MSc program entrance requirements in consultation with FGPS. However, we are also aware that there is significant competition for a relatively small applicant pool, and we are therefore mindful that increasing requirements could result in a dip in applications and intake, which could negatively impact research productivity. Over the last 3 years the number of students admitted to the MSc in Integrative Biology program has remained consistent; the total number of admissions to the MSc program in 2019, 2020 and 2021 were 16, 10 and 15, respectively (we believe the low 2020 intake was a direct result of Covid-19). Given the somewhat modest size of the program, and the overall strength of the students that we have been able to attract (students in the program regularly receive OGS, and occasionally NSERC CGS-M awards), we feel that the current entrance requirements are appropriate and do not require adjustments at this time.

FOS Decanal Comments: I agree with the Department's position to not adjust their entrance requirements to their MSc program at this time. No further reporting is required.

FGPS Decanal Comments: This is an appropriate response by the unit. Encouraging applications, as opposed to imposing further barriers or restrictions at this time is wise, especially given the competitive environment. Scholarship success is an important metric that indicates that the unit is attracting high quality graduate students. No further reporting is required.

Program Review Sub-Committee Comments: It is clear from the comments provided that everyone involved believes that the current entrance requirements for the MSc program are appropriate, and that no further changes are warranted at this time. No further reporting is required.

Full Recommendations from External Reviewers' Report: Explore the feasibility of accreditation for the BSc in Environmental Science (discussed on p. 98 of report). This involves examining whether the current programme courses align with the general requirements of accreditation (contact ECO Canada)			
Recommendation to be Implemented (from Final Assessment Report)	**Responsibility for Implementation**	**Anticipated Completion Date**	**Additional Notes**

Recommendation #7: Explore the feasibility of accreditation for the BSc in Environmental Science (discussed on p. 98 of report). This involves examining whether the current programme courses align with the general requirements of accreditation (contact ECO Canada)	Department, Dean of Science, Milton subcommittee	May 2020	Work with various units on campus to accredit the BSc in Environmental Science at the Milton campus

Unit Update: Since this recommendation was made, a campus in Milton was taken "off the table" by the provincial government, and only recently has again become a reality. Although a BSc in Environmental Science would align well with the "Planetary Health" theme planned for the Milton campus, it is not among the programs currently being considered initially, in part because we understand that there is a desire to not duplicate programs already being offered in Waterloo or Brantford. The BSc Environmental Science program in Waterloo remains a relatively small program; intake over the last 3 years has remained modest, with 6, 11 and 8 students entering in 2019, '20 and '21. As of August 2021, there were a total of 36 students in the program across all years. The department acknowledges that accreditation might increase interest in the program, and we have explored the accreditation process; but we feel that there are other challenges related to course availability, sequencing and scheduling that need to be addressed together with our partner departments (Geography & Environmental Studies and Chemistry & Biochemistry) before accreditation can be considered. The recent affiliation of GES with the Faculty of Science might help facilitate addressing these issues in the near future. Even so, the department does not feel that seeking accreditation for the BSc Environmental Science program is a high priority at this time. In addition to the structural challenges of the program that need to be addressed, we expect that much of Biology's time and attention over the next few years will be focused on developing some of the new programs that have been proposed for the Milton campus (e.g. Environmental Health Sciences, Computational and Systems Biology, Climate Change Management), thereby taking away time that could otherwise be used to seek accreditation of the BSc Env Sci program in Waterloo. Furthermore, the program's accreditation status doesn't affect students' ability to work toward their own professional accreditation, so those students who are interested can still seek accreditation even if the program itself is not accredited. Once the structural challenges of the program have been addressed, and related programs at Milton have been developed, the department would be interested in exploring the possibility of accreditation for the Environmental Science program in more detail; but we feel that now is not the time for this. Perhaps accreditation can be considered again when this program is next reviewed (in 2023-24) together with Water Science and Environmental Health.

FOS Decanal Comments: I agree with the Department's position to not seek accreditation of their Environmental Science program at this time. No further reporting is required.

Program Review Sub-Committee Comments: The committee understands the department's position on the value of seeking accreditation for this program at this time, and recognizes that there will be several opportunities to explore this possibility in the near future, including the recent transition of Geography and Environmental Studies into the Faculty of Science, the development of new programming for Laurier's Milton

campus, and the upcoming (2023-2024) cyclical review of the Environmental Science and Water Science and Environmental Health programs. A discussion of whether or not accreditation for the program should be sought could be purposefully incorporated into the cyclical review process. Since the Dean of Science is supportive of the department's decision not to seek accreditation at this time, no further reporting on this recommendation is required.

Full Recommendations from External Reviewers' Report:

Recommendation #17: The department, in collaboration with the relevant support unit(s) on campus, is encouraged to track alumni satisfaction. This will likely require leadership at the institutional level. The Alumni Association could help in facilitating the gathering of such information for Biology.

Recommendation #18: As in Recommendation 17 above, alumni satisfaction should be tracked. This will require institutional involvement. The Alumni Association could perhaps help in facilitating the gathering of such information for Biology.

Recommendation to be Implemented (from Final Assessment Report)	Responsibility for Implementation	Anticipated Completion Date	Additional Notes
Recommendation #17 and #18: The department, in collaboration with the relevant support unit(s) on campus, is encouraged to track alumni satisfaction	Department, Dean of Science Office	May 2019	Work with Alumni Relations Officer on creation of alumni satisfaction survey for FoS

Unit Update: The department agrees that tracking alumni satisfaction is a valuable thing to do, and some progress has been made in this regard. For example, testimonials from alumni were sought by the department and have been added to the wlu.ca program landing page(s). In addition to tracking satisfaction, the department sees the value in engaging with our alumni more generally, and has put forth effort to improve in this regard. For example, we worked with Development/Alumni Relations on the Anne Innis Dagg Lecture Series, a Biology initiative aimed at spotlighting women biologists, that ran for the first time in March 2020. Alumni were invited to the lecture, and there were discussions with DAR about using the event to highlight women alumni of the Biology program in a series of web stories leading up to it (although this didn't happen). The Department does not have the resources or expertise to track alumni satisfaction on our own, but would welcome the opportunity to work together with Alumni Relations and the Quality Assurance Office to conduct a survey before our next review. For now, the department feels as though we have done what we can, and that the spirit of this recommendation has been met.

FOS Decanal Comments: This an issue that the University as a whole needs to grapple with given the reporting requirements of the Strategic Mandate Agreement with the Province. Indeed, the Department has made appropriate attempts to address this recommendation recognizing the limitations. No further reporting is required.

FGPS Decanal Comments: The testimonials on the landing pages are an excellent idea to assist with recruitment. I believe these are only listed on the BSc page. Testimonials from students that completed an MSc could be added to the MSc page. Feel free to contact our new FGPS Communications Coordinator, Jessica Hunt (jeshunt@wlu.ca), to help facilitate. No further reporting is required.

Program Review Sub-Committee Comments: The committee appreciates hearing about the initiatives that the department has put into place since the cyclical review to implement this recommendation. Based on the progress that has already been made by the department in implementing this recommendation, as well as the shared perspectives of the deans, no further reporting on this recommendation is required. In advance of the next cyclical review, the committee does encourage the department to reach out to the FGPS Communications Coordinator, as suggested by the Dean of FGPS, to facilitate the collection and sharing of MSc alumni testimonials on the program webpage. The Quality Assurance Office is happy to support the department in developing and administering an alumni survey at anytime, as the collection of this type of feedback has become embedded into the cyclical process more widely since the department's last cyclical review.

ADDITIONAL COMMENTS

Unit: None of the recommendations provided in 2018 necessitated significant curriculum changes to any of our programs. Nevertheless, as a result of regular reflection and discussion amongst faculty (during regular faculty retreats, for example), the department undertook a series of changes to address some perceived gaps in the curriculum and content overlap in some courses (identified at the Concentration level following mini curriculum-mapping exercises by small groups of faculty who teach courses within each concentration). These changes needed to be introduced in stages, and are still being proposed and implemented. Therefore, the department is on track to be in a position to undergo a curriculum mapping exercise as early as Spring 2022. The next logical steps will be to update program-level learning outcomes and subsequently establish tools and metrics for assessing those PLOs. This should help inform the department's next periodic review. While progress toward this recommendation is still ongoing, the department feels that all other recommendations have been adequately met.

FOS Dean: The Department is to be commended for thoughtfully considering each the specific recommendations and addressing them appropriately, as well as planning to update their program-level learning outcomes. Again, I have no doubt they will complete the task of establishing the tools and metrics for their assessment.

FGPS Dean: I concur with the FOS Dean. The very few recommendations associated with the graduate program have been addressed.

Program Review Sub-Committee: The committee appreciates the information and examples shared throughout this report addressing how the Department has worked towards implementing the recommendations prioritized in the 2017-2018 cyclical review. The committee concurs with the deans that all of the recommendations prioritized either have been completed, or have sufficiently progressed to not require any further reporting. No additional Implementation Reports will be required in advance of the department's next cyclical review, scheduled as part of the 2024-2025 review cycle.

Subsequent Report Required: No

Next Cyclical Review: 2024-2025