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*Chair of the Assembly of the Academic Senate
Faculty Representative to the Regents
University of California
1111 Franklin Street, 12th Floor
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March 23, 2017

**AIMÉE DORR
PROVOST AND EXECUTIVE VICE PRESIDENT
UNIVERSITY OF CALIFORNIA**

Re: Approval of Master of Conservation and Restoration Science (MCRS) Degree at UC Irvine

Dear Aimée:

In accordance with the *Universitywide Review Processes For Academic Programs, Units, and Research Units* (the “Compendium”), and on the recommendation of CCGA, the Academic Council has approved UC Irvine’s proposal to establish a self-supporting Master of Conservation and Restoration Science (MCRS) degree program.

Because this is a new degree, and the Assembly of the Academic Senate is not meeting within 30 days of CCGA’s approval, Council must approve the program per Senate Bylaw 125.B.7.

I am enclosing CCGA’s report on its review of the new degree, and respectfully request that your office complete the process of obtaining the President’s approval.

Sincerely,

A handwritten signature in blue ink that reads "Jim Chalfant".

Jim Chalfant, Chair
Academic Council

Cc: Academic Council
Senate Director Baxter
Senate Executive Directors



COORDINATING COMMITTEE ON GRADUATE AFFAIRS (CCGA)

Kwai Ng, Chair
kwng@mail.ucsd.edu

ACADEMIC SENATE

University of California
1111 Franklin Street, 12th Floor
Oakland, California 94607-5200

March 6, 2017

ACADEMIC COUNCIL CHAIR JIM CHALFANT

Dear Jim,

At its March 1, 2017 meeting, the Coordinating Committee on Graduate Affairs (CCGA) voted to approve the proposal for setting up a self-supporting graduate program leading to a Master of Conservation and Restoration Science (MCRS) degree within the Department of Ecology and Evolutionary Biology in the Francisco J. Ayala School of Biological Sciences, University of California, Irvine (UCI). The proposal was approved unanimously by the CCGA members who attended the meeting. Two campus representatives, including UC Irvine's campus representative (who would have abstained) and UC Riverside's representative, were unable to attend the meeting.

The MCRS program targets working professionals and recent baccalaureate graduates who want to advance their knowledge, skills, and careers in the area of environmental management, conservation, restoration and sustainability. MCRS's two-year program of study will consist of a four part curriculum: a first year sequence of core topic and professional development classes, a summer research/policy internship, a second-year of elective courses, and a team-based capstone project. The summer internship and capstone experience are focused on the stakeholder-engaged science coordinated through the UCI Center for Environmental Biology (CEB) with community partners, where students will be embedded in real-world conservation and restoration settings. As this program is designed to be interdisciplinary, skills-based, and oriented towards training current and future practitioners, several short-courses and specialty workshops will be taught by external partners from non-profit land management, agency, for-profit consulting firms, and environmental policy settings.

External reviewers solicited by CCGA's Lead Reviewer Donald Smith praised the quality of the faculty, particularly in the area of conservation ecology. Reviewers recognized the need for the proposed MCRS program and believed there likely would be sufficient demand to sustain the program, even with the presence of a couple of disciplinarily similar programs in the UC system (The Master of Environmental Science and Management program at UC Santa Barbara, and the Master's Degree in Environmental Science program at UC Riverside). The program is expected to attract enough students to achieve self-supporting status. The program's curriculum also compares very favorably in breadth and content with some of the top conservation and restoration programs in the country. Upon completion of the program, students will be able to lead and collaborate in the planning, design, implementation, and management of complex, large-scale environmental conservation and restoration activities, in agency, non-profit, and for-profit settings.

While reviewers were generally positive about the rigor of the program, they raised concerns about the limited expertise of the faculty in restoration ecology. In light of this singular concern raised by

reviewers, CCGA asked the proposers to address the apparent lack of faculty specialized in restoration ecology. Upon the request of CCGA, the Ayala School Dean has agreed to commit to a future FTE hire in restoration ecology. The hire is contingent upon favorable program growth. This FTE will be hired starting in Year Three of the program, which coincides with its scheduled review as a SSGPDP. Hiring an additional FTE in the third year would allow the program to include criteria in the search associated with the teaching needs identified, the specific mentoring needs of students as they develop different capstone research experiences, and the emerging opportunities associated with the community stakeholders for scholarship areas enhancing local restoration efforts.

Prior to this hire in the third year, key existing UCI staff and qualified outside practitioners will collectively provide content in courses on restoration methods. The proposers are confident that by pulling together the talents of existing staff and visiting scholars, they can bridge the beginning of the program to the time when a new ladder-rank faculty in restoration ecology joins the program.

This self-supporting MCRS program will charge a total of about \$49,500 (all inclusive) per student. This cost structure is based on market analyses, similar costs of comparative programs in the U.S., and the cost of mounting and sustainably offering the program. Based on UCPB analysis, the budget appears adequate for the program to sustain itself, assuming student demand and enrollments achieve the projected levels. Financial aid will be provided via “return-to-aid” from the program’s revenue for competitive need-based and diversity fellowships in the second year of the program at \$40,000 (at enrollment target of 35) students. The financial aid will be increased to \$60,000 in the third year of the program (enrollment target of 45 students).

CCGA recommends the UCI Graduate Council 1) monitor student demand and enrollments closely, possibly at a mid-cycle review after 3 years, in order to assess the realism of the program’s admission plan. The recommended review, CCGA believes, would contribute to the continued sustainability of the program as a SSGPDP. And 2) monitor, again possibly at a mid-cycle review, whether the benefits and effects of the MCRS enrollments on PhD students for the shared core courses are as positive and productive as expected.

As you know, CCGA’s approval is usually the last stop of the Academic Senate side of the systemwide review and approval process except when a new degree title must be approved by the Assembly of the Academic Senate (or the Academic Council if the Assembly is not meeting within 30 days of CCGA’s approval). Given its status as a new graduate program title on the Irvine campus, CCGA submits its approval of the Master of Conservation and Restoration Science degree program for formal approval by the Assembly of the Academic Senate. For your information, I have included our lead reviewer’s final report as an enclosure.

Respectfully submitted,



Kwai Ng
Chair, CCGA

cc: Shane White, Academic Council Vice Chair
CCGA Members
Hilary Baxter, Academic Senate Executive Director
Michael LaBriola, Academic Senate Analyst
Kimberly Peterson, Academic Planning Analysis Manager

Chris Procello, Academic Planning and Research Analyst
William Parker, Irvine Division Senate Chair
Natalie Schonfeld, Irvine Division Senate Executive Director
Adriana Collins, Irvine Division Senate Analyst

Enclosures: (1)

Draft Report for the UC Irvine (UCI) Proposal for a Self-Supporting Graduate Program leading to a Master of Conservation and Restoration Science degree

Donald Smith, Lead Reviewer
March 6th, 2017

The proposal is to establish a new, self-supporting graduate program leading to a Master of Conservation and Restoration Science (MCRS) degree within the Department of Ecology and Evolutionary Biology in the Francisco J. Ayala School of Biological Sciences, University of California, Irvine (UCI). The MCRS program targets working professionals and recent baccalaureate graduates who want to advance their knowledge, skills, and careers in the area of environmental management, conservation, restoration and sustainability. MCRS's two-year program of study will consist of a four part curriculum: a first year sequence of core topic and professional development classes, a summer research/policy internship, a second-year of elective courses, and a team-based capstone project. The summer internship and capstone experience will focus on stakeholder-engaged science coordinated through the UCI Center for Environmental Biology (CEB) with community partners, where students will be embedded in real-world conservation and restoration settings. As this program is designed to be highly interdisciplinary, skills-based, and oriented towards training current and future practitioners, several short-courses and specialty workshops will be taught by external partners from non-profit land management, agency, for-profit consulting firms, and environmental policy settings. Upon completion of the program, students will be able to lead and collaborate in the planning, design, implementation, and management of complex, large-scale environmental conservation and restoration activities, in agency, non-profit, and for-profit settings.

The program will be administered through CEB staff, with courses taught by Ecology and Evolutionary Biology faculty holding CEB affiliations. The program will initially have a small number of service courses from Earth System Science and Planning, Policy, and Design. The MCRS proposes to develop alternative curriculum delivery, beginning with courses offered during alternative time-periods, continuing with significant portions being offered online, and finally including an accelerated program for current professionals that reduces the length of the program to a single year. The proposers indicate that no additional faculty need to be hired for this degree program, *however there were comments from all four outside reviewers that the CEB faculty and staff lacked sufficient expertise in restoration ecology (discussed more below)*. The program will make use of existing facilities in the School of Biological Sciences.

Degree requirements:

The MCRS program will admit up to 25 students annually and is aimed at a maximum of 50 students across two cohorts. The program is a Plan II (capstone) Master's and will consist of six quarters with 12 units planned per quarter and require a total of 72 units for the program. Required coursework includes core content courses (N=5, 18 units), electives (N=4, 16 units), technical and professional skills courses (N=6, 18 units), technical and professional workshops (N=4, 8 units), and the group capstone project (12 units) for a total of 72 units over two years. In addition, a summer internship program will be developed – the internship will be highly recommended for completion during the summer between years 1 and 2. The group capstone project will be completed during their second year in the program; for this, groups of 3-6 students will complete a project involving community-engaged scholarship in collaboration with a local partner/stakeholder to address a current management need and/or solve a real environmental problem.

Relationship with other UCI programs, and comparison to other existing programs outside UCI:

This program will not be in direct competition with any current programs in EEB or the Ayala School, though the MCRS will rely on a first year core curriculum that leverages two courses currently taught

within the Ph.D. program in EEB, other existing undergraduate courses in the curriculum, and new courses to be developed by CEB faculty.

There are not comparable programs within the University of California, although there are two degree programs that the proposers anticipate to have a similar target audience. The Master of Environmental Science and Management program at UC Santa Barbara, and the Master's Degree in Environmental Science program at UC Riverside. The UCSB program is a two-year professional Master's that offers seven specializations within the degree; one of these specializations is Conservation Planning, and is likely to appeal to the same target audience as the proposed MCRS degree program at UCI. The UCSB program receives ~400 applicants each year, of which ~80 are admitted – so while there may be some programmatic overlap with the UCI program, they are not expected to significantly compete for the same students. Similarly, the UC Riverside program offers a focus area in Environmental Sciences and Management. The UCR program is two-year thesis/research based M.S., and is not expected to significantly compete with the MCRS professional program.

Outside UC there are several MS based programs in conservation and/or restoration ecology. These include programs at Duke University, Yale University, the University of Wisconsin, and the University of Central Florida – comparisons with these programs were noted in the market analysis. The UCI MCRS program is not likely to compete directly with these programs. Another program noted by one of the reviewers was the W.A. Franke College of Forestry and Conservation at the University of Montana, which offers a graduate degree in conservation and restoration. This program offers a Master's in forestry with an emphasis in restoration, and likely will not compete with the UCI MCRS program.

Program Faculty, Workload and Faculty Compensation

Program Faculty will initially be comprised of current EEB department faculty and CEB faculty affiliates. State supported faculty will be compensated by the program where MCRS student fees will cover the costs. It is suggested that there will be little impact on the workload for faculty participating in this curriculum, namely the potential increase in grading time due to increased student enrollment in courses. However, course development may increase faculty workload. Faculty can choose one of the two ways to get compensated: a course buy out or being paid a flat fee on an overload basis.

Program Cost and Financial Aid for Students:

This self-supporting MS program will charge students ~\$49,500 (all inclusive). This cost structure is based on market analyses and similar costs of comparative programs in the U.S., and the cost of mounting and sustainably offering the program. They provide a comprehensive comparison of costs charged by other comparative programs, which substantiates that the proposed cost structure is somewhat higher than (versus the UCSB program) or generally competitive with these programs.

Based on UCPB analysis, the budget appears adequate to ensure a self-supporting program, assuming student demand and enrollments achieve the projected levels. Nonetheless, CCGA recommends that the UCI Graduate Council monitor student demand and enrollments closely, possibly at a mid-cycle review after 3 years, in case they do not meet enrollment expectations.

Financial aid will be provided via “return-to-aid” from the program's revenue for competitive need-based and diversity fellowships in the second year of the program at \$40,000 (at enrollment target of 35) students. The financial aid will be increased to \$60,000 in the third year of the program (enrollment target of 45 students). The funding will be increased \$20,000 each year up to \$100,000. The budget has been developed to offer fellowships, either as year-long scholarships or as supplements on a quarter basis, in order to recruit and retain a diverse student body. Additional financial aid is expected to come from “development funds” received from partners or stakeholder groups and private donors.

Strengths and need of the proposed program highlighted by the four external reviews:

1. There was unanimous recognition by the reviewers that the proposed MCRS program would fill a need and likely be in sufficient student demand to justify the program, even with the presence of several other disciplinarily similar programs in the UC. Thus, there was generally strong support for the both the need and benefit (to professionals) for the proposed program. In general, the reviewers thought that graduates of the program would be sufficiently qualified to further advance their professional careers in the conservation field, though some concerns were raised as well (on the restoration side of the program, as addressed below).
2. The program's curricula compares very favorably in breadth and content with some of the top conservation and restoration programs in the country.
3. All four reviews praised the quality of the faculty, particularly in the area of conservation ecology. There were concerns raised by all four reviewers about the limited expertise of the faculty in restoration ecology. This was addressed by the proposers by securing a commitment from dean for a new faculty FTE in restoration ecology after the first two years of the program (see below).

Challenges and weakness pointed out by the reviewers and proposers' responses (responses from the UCI proposers were received February 20, 2017):

1. There was general recognition by all four reviewers that the participating faculty are very strong on the ecological conservation side, but concerns were raised about the limited faculty expertise in restoration ecology. One reviewer noted "As a restoration ecologist, I was surprised, however, that UCI is proposing a masters with "restoration" in the title since to my knowledge there are not any tenure-track faculty at UCI with a focus in restoration ecology...", "...I would think that UCI would need to hire at least one tenure-track restoration ecologist to mount a master's program in this field."

Another reviewer noted "...I would expect that for a University to establish a Master's program in a field they would have more faculty expertise in that area [restoration] to guide the program and help advise the many capstone projects proposed."

Another reviewer noted "...I am concerned about a lack of expertise in terms of ecological restoration." "...Given that half of the program is dedicated to restoration, that lack seems like a pretty big gap in expertise. ... It is essential that if a new hire is made that the new person will have a background in ecological restoration."

Finally, a fourth reviewer noted, "Many of the listed faculty have little experience in applied restoration ecology, and this may mean that for the program to produce truly excellent students, they will need to hire additional faculty."

Response: In their initial response, the proposers indicated they would "*leverage our external partners and non-senate UCI Ph.D.-level staff to assist in teaching as we grow faculty expertise in restoration. These individuals will also provide efficiencies assisting our faculty in advising. We are confident of the likelihood of success of this strategy because of the efforts we have placed in our department's development. We have (1) identified the faculty hiring needs through careful planning, (2) fostered robust partner networks to evolve our current faculty's capacity, (3) hired permanent personnel committed to supporting research and student training, (4) developed a partner network including high-performing scientists working in applied settings, (5) grown our faculty recently as*

foundation for this strategic area of growth, and (6) provided sufficient financial resources to carry out these activities.

In the opinion of the CCGA lead reviewer, this response did not sufficiently alleviate the concerns raised by the four outside reviewers. As follow-up, the CCGA lead reviewer expressed this continued concern with the proposers, who then met with dean LaFerla to secure a commitment for a new faculty FTE in restoration ecology after the first two years of the program. Dean LaFerla noted in his February 28, 2017 letter to proposers Drs. Huxman and Pratt “...I am pleased to commit a faculty FTE, allocated for a position aligned with your program needs and the priorities of Ecology and Evolutionary Biology surrounding this topic [restoration ecologist]. I anticipate allocating this position in the third year of this program, where we can work together over the first two years of operations to insure sufficient student growth, graduation, and placement indicative of a strong, developing program with the opportunity to maintain consistent enrollment and where we can make educated decisions about the nature of the new faculty's area of scholarship and how it contributes best to the program.” This outcome satisfactorily addresses the concerns of the four outside reviewers and the CCGA lead reviewer.

2. On balance, the reviewers seem to support the plan to mix the MCRS and PhD students in key core courses. However, in discussion of the reviews at CCGA, some members raised concern over this as well. CCGA asks that in the near-term the proposers explicitly address measures to ensure that the relatively large MCRS enrollments will not negatively impact the course/training environment for the doctoral students in those classes. In addition, CCGA will ask that UCI's Graduate Council monitor this at some mid-cycle review (e.g., 3 yrs.) to assess whether the benefits and effects on the MCRS and PhD students are as positive and productive as expected.

Response: *We agree with this concern, despite our belief in the pedagogical benefits, and have thus built in several aspects of the program to be responsive. First, we have identified enrollment thresholds (5 or 10 students) for triggering the opening of stand-alone sections of the two key classes for which student populations might be mixed in order to maintain quality. Second, we originally modified the program to accelerate the use of alternative forms of content delivery so as to provide options for the MCRS students beyond the classroom setting. Yet we are trying to preserve the many other opportunities for interaction associated with activities where the PhD students and MCRS student may connect. See – section 2.3 program of study. We will gladly report to the UCI Graduate Council on this issue during the first few years of the program.*

3. A clear plan for return to aid (RTA) was described in the proposal, though it was not clear to the CCGA reviewer how specifically the RTA will be used to enhance student diversity. Can you address this?

Response: *We plan on offering both merit based and need based fellowships based on the best practices of a successful program and fellowships aimed at enhancing diversity. We plan to work with existing self-supporting programs on campus to understand the best practices at making these awards and working closely with graduate division to understand our diversity needs.*

4. The program should consider a wider range of undergraduate majors among the applicants, beyond the stated students with backgrounds in social ecology, public health, or environmental policy

Response: *We agree and have added this in the program requirements. We altered the descriptions of undergraduate degree programs in the proposal to include a broader, more encompassing description of the range of appropriate undergraduate majors (our catch-phrase used in the proposal was not sufficiently inclusive and we have changed it; section 2.1)*

5. Several reviewers commented that the quality and academic rigor of the proposed MCRS program is very high and commensurate with UC standards, however, several reviewers also raised some concerns with the quality/structure of the program, with one reviewer commenting that “the idea that the extremely minimal requirements for the program, including a 3.0 GPA, a year each of biology and chemistry, and a course in math or statistics, could be modified or dropped based on work experience, honestly makes it feel like an extension program rather than one that seeks to provide the best possible training for the best and brightest in the region.”

Response: *While it is our hope that all students meet this minimal requirement, the flexibility we feel this rule allows us is the ability to recruit a student that completed an undergraduate program 10-15 years ago, having performed poorly, yet who has since demonstrated significant excellence in their continued activity in their field. We anticipate this to be quite rare and have clarified this in the proposal.*

6. It would be good to offer a course in grant and project proposal writing since those are skills that nearly every environmental professional needs, but perhaps that is covered in the project management class.

Response: *We agree, and currently we plan to deliver this content in the Technical Writing Course. In addition, the curriculum offered in the Conservation Biology and Restoration Ecology courses will contain exercises in that contribute to these issues above, including at minimum a grant proposal and a habitat restoration and monitoring plan. Our plan for the Technical Writing Course is to modify our current graduate writing course that uses a workshop approach to developing writing skills.*

7. One reviewer commented that he/she was not sure that a strong academic core course and the lives of working professionals dovetail well together. Programs like the summer workshops, which are recommended but not required, are not well defined, particularly in how these will be both rigorous and yet fit in with a working person’s schedule.

Response: *It is important to note that the rigor of the summer internship relies on the depth of the partner involvement in the program. We will be hiring an internship coordinator whose job it is to establish meaningful experiences (and leveraging the four Ph.D. level staff in CEB we identified earlier in our response) to create meaningful relationships with the partners. At the same time, the internship is explicitly not required because the professional experience associated with students identified as ‘working individuals’, would likely come from their continued employment.*

8. Reviewers commented “More than one course should be required in environmental law, planning, and economics. Any land manager who works in the California coastal zone will tell you that permitting is one of the most challenging aspects to implementing a restoration project”. And that “...the MCRS program would benefit from the inclusion of a soil science course and a course on design”.

Response: *We agree that most individuals need multiple courses in what we identify as Elective Category A. However, based on our incoming student backgrounds, individuals may differentially plan their six elective courses. For soil science – we agree! We will work to add this course to our offerings in time and have included it in the listing of “to be developed” electives in the proposal.*

9. Concern was raised about student funding for the summer internship.

Response: *We agree. In our current partnership with our key organizations we've been successful at developing paid internships. One has just committed to offering experiences at the graduate level to programs at UCI (Irvine Ranch Water District – <https://ess.uci.edu/node/11676>).*

10. "The curricular depth for the capstone course and potentially for the workshops was not clear, going on to comment "...the summer workshops, which are recommended but not required, are not well defined, particularly in how these will be both rigorous and yet fit in with a working person's schedule."

Response: *We have worked to better describe the process of assessment, review, and requirements for the capstone experience, of which we envision three required components. See details in proposal section 2.3f Program of Study.*

11. Concern was raised about the practicality of developing 7 of 11 new courses core courses and several new workshops in a single year. It seems like a large undertaking even for two lecturers. Can you please address this workload issue?

Response: *As an update, we spent this year developing these seven courses (syllabi, learning goals, and assignment/assessment structure) to be on the books for next year. This is now updated with the newly assigned course numbers in proposal section 2.3.d.*

12. As a professionally-oriented degree program, there seemed to be general acceptance that the program could be self-supporting. However, some concerns were raised about the cost to students, how the costs compared to other similar programs, and whether the relatively high overall cost of the program might affect student demand. Thus, while the budget appears adequate to ensure a self-supporting program, assuming student demand and enrollments achieve the projected levels, CCGA recommends the UCI Graduate Council monitor student demand and enrollments closely, possibly at a mid-cycle review after 3 years, in case they do not meet expectations.

Response: *We welcome this review.*

In summary, the proposed program is intellectually strong and the program faculty well qualified to deliver it, especially with the committed future restoration ecologist faculty hire. Reviewer and UCPB concerns have been adequately addressed in the revised proposal. I have no further questions or issues with the proposal and commend the proposers for being very responsive to the reviews. I recommend its approval.