**Academic Program Review (APR) Exit Meeting Presentation**

Part I: Cover Page

Program/Department: Department of Biology

Exit Meeting Date: April 14, 2017

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Part II: Body

**Overall Program Strengths**

The Department of Biology at the University of New Mexico (UNM) is a strong, vibrant department with a tradition of excellence in teaching, research, and service in areas of great strategic importance to the institution and the State of New Mexico. Our Academic Program Review (APR) team heard from the faculty as a whole, Distinguished Professors, untenured faculty, lecturers, staff, graduate students, and museum personnel. Almost to a person, we heard of a collegial, mutually supportive department that enables individuals to excel. The department currently enjoys strong internal leadership, and the morale *within* the department is excellent.

The department serves about 1700 Biology majors, as well as many other undergraduates who take biology courses as pre-requisites for other majors (e.g., Biochemistry), as requirements for other health-related majors (e.g., Physical Therapy and Nursing), or to meet UNM general core curriculum requirements. The department’s faculty and UNM’s upper administration all recognize the importance of the undergraduate teaching done by the department in service of the institutional mission, and by all accounts, the department is doing an excellent job. The involvement of many of the tenured/tenure-track faculty in teaching the four courses that constitute the core curriculum of the Biology major and in thoughtful core course redesigns is commendable. The department also has a strong, cohesive team of full-time lecturers to complement the teaching by tenured/tenure-track faculty and assist with serving the needs of non-majors. With just one or two notable exceptions, the instructional laboratory spaces are in good shape.

The department’s graduate program is flourishing. The 69 PhD students and 23 master’s students provide a critical mass that support collaboration and exchange of ideas. During our visit, we attended an outstanding brown bag presentation by one of the doctoral students. This lively and very well attended event was indicative of a thriving graduate program in which students receive ample opportunities and encouragement to excel.

The quality and productivity of the faculty in research is exceptional. The department had over $11 million in grant expenditures in FY16, making it one of the top funded UNM departments. The faculty are publishing well, with publications and citations per faculty member that are on par over the past four years with the department’s aspirational peers. The faculty includes multiple prominent senior figures in the field (in addition to a recently retired member of the National Academy of Sciences) as well as several outstanding newly hired assistant and associate professors. The productivity of the faculty is strong across all ranks.

The UNM Museum of Southwestern Biology and Sevilleta Field Station are internationally known. Both are extremely important strategic assets for the Department of Biology, the institution, and its diverse stakeholders. UNM has hosted a Long-Term Ecological Research (LTER) site at the Sevilleta since the inception of that core NSF program (1988); it is a highly productive research hub that attracts an international community of leading scientists. It is also a statewide center for education and outreach in the biological sciences. It maintains strong ties to the Sevilleta National Wildlife Refuge and Visitors' Center, which receives >13,000 visitors per year. The Museum of Southwestern Biology (MSB) has similarly established an outstanding reputation within the research community. Its particularly deep collections in the fauna and flora of the American Southwest have helped the museum’s curators, and the department more generally, develop strong ties to state government agencies – an important consideration at state-supported institutions. Further assessments of the strengths and needs of the Sevilleta LTER and the MSB are discussed under Criteria 6 and 9.

The department is extremely well regarded, and as a general biology department, it is competitive nationally. In ecology, the department’s strongest area of emphasis, its performance is equivalent or stronger to the performance of our home departments at the University of Arizona, University of Minnesota, and University of Oklahoma. While we note several areas in the subsequent sections of this report where the program needs investment and support to remain on this positive trajectory, it is clear that the Department of Biology is one of the University of New Mexico’s true gems. With continued and appropriate support, we are confident in the program’s ability to continue performing at a very high level.

Executive summary of external reviewer recommendations:

While this is clearly a very strong department, the Academic Program Review (APR) team notes several areas, discussed in subsequent sections of this report, where actions are needed to keep this high-performing department on a positive trajectory in teaching, research, and service. Some of the issues needing attention can be addressed by the department alone. However, it is important to note that others are outside of the department’s control and would require actions by the College of Arts and Sciences and/or the UNM upper administration. For convenience, these recommendations are summarized briefly below:

1. The UNM and the Department of Biology need to develop a viable plan and budget for funding the start-up packages needed to replace retiring or departing faculty with the high-quality hires needed to sustain the department’s current research productivity and extramural grant funding. The start-up amounts in the plan should be calibrated to the national marketplace for faculty hiring in the discipline.
2. The department needs to develop a comprehensive strategic plan for future faculty hiring. It should capitalize on the department’s historical success related to its desert southwest location, its internationally renowned assets (museum and field station). It should honor the department's strong reputation in ecology and evolutionary biology while accommodating the curricular needs of undergraduate students, the majority of whom are seeking predominantly pre-medicine/pre-health-careers.
3. The UNM and its departments, including but not exclusively the Department of Biology, need to work together to achieve the goal of a service-oriented culture in the pre-award office. The Controller’s department and college departmental leadership should meet in person to discuss strategies for reform.
4. The possibility of differential tuition for STEM disciplines should be explored.
5. Salary inequities can lead to serious morale problems. We recommend eliminating the "promotion penalty" for lecturers - promotion currently results in lecturers being worse off financially. In addition, we recommend that care be taken to adjust faculty salaries across the department when new hires are made or faculty members retained.
6. The College of Arts and Sciences and UNM need to reform their approach to faculty retention. The university needs to move to a proactive, rather than reactive, stance.
7. The institution should reexamine the strategies being used to provide seed funding for supporting existing and strategically important research assets and for developing new ones.
8. The position descriptions for museum curators should be revised to encourage and reward these faculty members for the work they do to build and maintain research collections.

**Criterion 1 Program Goals**

Overall Findings: Met (M)

The Department of Biology’s stated mission is threefold: (1) to train undergraduate and graduate students, (2) to conduct high-quality, nationally and internationally recognized research, and (3) to serve the community, the University, and the disciplines represented within it.

The department easily meets each of these program goals. We expand on this evaluation in other parts of this report. With regard to the first goal (and as discussed in greater depth under Criteria 2-4), cutting-edge biological science is being transmitted rigorously and creatively to both undergraduates and graduate students. Beyond traditional classroom education, students are afforded ample opportunities to conduct hands-on research. Relevant to the second goal, faculty are conducting exceptionally exciting research and presenting it in top national and international outlets. As a direct consequence, the department continues to maintain a reputation as a top graduate program in many of the fields it covers (see under Criteria 4-5). Finally, there are many indications of departmental excellence with regard to the third goal. Its scholarly excellence clearly serves the disciplines it covers. Further, it is clearly one of the top UNM departments in terms of grants received, and overhead from these funds are used to support other academic units and diverse OVPR initiatives. It also maintains outstanding resources, offering added value to a broad community. These include the Museum of Southwestern Biology, with its extraordinary depositories of biological diversity, and the renowned Sevilleta Long-Term Ecological Research Facility, where biologists are documenting dynamics of unique New Mexico ecosystems. Both facilities, which are described in greater depth under Criteria 6-7, serve the needs of researchers worldwide. However, they are also heavily utilized by University instructors and students, as well as by a much broader community of state residents.

Although the department is doing an exemplary job fulfilling its tripartite mission, it has the potential to do an even better one. This would, however, require that certain constraints it currently faces, most but not all of them financial, be alleviated. We discuss these constraints in depth in the sections that follow.

**Criterion 2 Teaching and Learning: Curriculum**

Overall Findings: Met with concerns (MC)

The Department is meeting most but not all of the evaluation criteria related to curriculum. Below we discuss undergraduate and graduate curriculum issues separately, as the educational needs of these two groups of students are quite different.

*Undergraduate Curriculum*

The department is meeting the curricular needs of an exceptionally large number of majors, and equally strikingly, a broader group of students with exceptionally diverse educational needs. This includes students heading for careers in biology, but also general education students and a large population majoring in health and allied-health programs. It is difficult to design a curriculum that can simultaneously meet the needs of such a wide audience. We concluded that, for the most part, this difficult enterprise is meeting with success.

The committee was impressed by the committed involvement of tenured and tenure-track faculty in the undergraduate curriculum. They mostly handle the mid- to upper-level courses, which appear by all metrics we saw to be successfully delivering cutting-edge material to students. As is appropriate, faculty teach the first courses that biology majors take (the core sequence BIO 201-204, Cell Biology, Genetics, Ecology and Evolution, and Plant and Animal Form and Function). The department’s success at undergraduate education, however, would be impossible without its exceptional cohort of lecturers as well. These individuals handle the very large nonmajors lab classes. We consider it essential to keep this highly trained, valued and respected cohort, many of whom have been with the department for many years, well-remunerated for their activities (see under Criterion 6).

Although not curricular *per se*, opportunities for involvement in ongoing research have become a central criterion for judging excellence in undergraduate education. These engaged experiences provide students with the skills employers want in prospective employees, enhancing their competitiveness and preparing them for their careers ahead. We were pleased to see that UNM biology students have excellent opportunities for hands-on training in faculty labs and at the Museum of Southwestern Biology. About 200 undergraduates each year work in faculty labs, and apparently a remarkable one-third of these authored or co-authored at least one peer-reviewed scientific article based on their research. We urge the department to keep better records documenting the number of undergraduates working in labs and their achievements in research, then advertising it widely; this is an achievement to actively promote. UNM’s aspirational peer institutions are using undergraduate research opportunities as a key selling point to aggressively recruit top students.

Beyond involvement in faculty labs, UNM students have hands-on educational experiences via many training grants, including ones specifically designed to offer opportunities for minorities. The faculty deserve praise for their success in obtaining these highly desirable but often elusive grants. In addition to conveying factual and conceptual information to their students, faculty appear to be focusing their pedagogical efforts on providing undergrads with the opportunity to develop/practice a variety of skills (e.g., critical thinking, working in groups, and processing information) that are highly valued by employers. Another indication of the department’s commitment to the undergraduate teaching mission is that the faculty has been extraordinarily successful in obtaining extramural funding for undergraduate support.

There was general consensus among those we spoke to, however, that the upper-level undergraduate curriculum is badly in need of review. Indeed, this element of the curriculum has not been comprehensively evaluated by the department in over thirty years. Notably, there are few course offerings at all relevant to human biology, which is the focal interest of large numbers of UNM students. The few such 400-level courses are heavily oversubscribed. This weakness risks making the biology major less attractive to these students than it has the potential to be. We can envision exciting new courses that would serve the needs of these students while building on the department’s outstanding strengths in ecology and evolution. These might include, for example, courses on global change and human health, and on the evolution of infectious disease. Strengthening and modernizing the curriculum seems likely to better serve and stem the departure of medically oriented students who don’t currently see the biology major matching their interests and needs.

It is also time for a thorough and critical review of the concentrations that undergraduates can pursue within their biology major. There are currently three of these: Biotechnology, Conservation Biology, and Ecology, Evolution, and Organismal Biology. Concentrations serve to direct students to subsets of courses that meet their particular interests and career orientations. Relatively few students, however, declare a concentration. We found them to be very uneven in conception. The Ecology, Evolution, and Organismal Biology concentration is well-formulated and clearly presented to students. It includes a significant hands-on learning component as well as a comprehensive menu of course offerings. Perhaps this is not surprising, since this concentration is centered in a focal strength of the department. The other two concentrations seem to be less well-structured and, based on the documents we were given, only cursorily presented to students. Updating these concentrations, perhaps adding others (e.g., one attractive to students interested in human health), thoroughly informing the undergraduate advisors about them, then aggressively advertising them on campus could add valuable structure to a program that must serve students with exceptionally diverse needs. Further, a comprehensive review of the concentrations would simultaneously point the department to the most important gaps in course offerings and generate healthy discussion on how these gaps might be filled.

*Graduate Curriculum*

As discussed under Criterion 4, the graduate program in biology as a whole is very strong, with students provided with outstanding opportunities to learn most of the skills they will need to continue professionally in biology.

Students and faculty alike, however, believe that it is time to revisit the structure of the graduate curriculum and its course offerings. There are a number of concerns; most of them have feasible solutions that are already being discussed to good effect in the department. Here we enumerate three of these.

* Graduate students are required to fulfill many hours of courses, but relatively few graduate-level courses are actually offered on a regular basis. This forces students to take classes that are somewhat distant from their research interests, prolonging their time to degree, particularly given simultaneous time constraints due to heavy TA loads. Reasonable solutions include either (a) reducing the number of courses required of them, or else (b) offering more courses. A third and rather simple resolution is strictly a paperwork issue: the numbering of BIO 502, a grab-bag designation for diverse seminars and lab groups, could be changed. Designating these as (for instance) 502a, 502b, and so on would, quite reasonably, allow students to take what are essentially different courses for credit.
* Few courses at present focus on teaching graduate students the core skills they will require as professional biologists. The Assistant Professors reasonably argue that graduate students should be required to take courses in scientific writing, grant writing, and data analysis. Several graduate students we spoke to made the same point. We strongly urge the department to consider the feasibility of adding such offerings, perhaps in seminar format (i.e., included in the BIO 502 umbrella). This issue is discussed in more depth under Criterion 4.
* Course offerings are particularly thin in Cellular and Molecular Biology (CMB), forcing graduate students in this area to look outside the department for training. While we understand the difficulty of developing a curriculum focused on a smaller group of students compared to Ecology and Evolution, this is a circular problem, since a lack of course offerings also risk making this part of the department less attractive to top recruits. We see this as part of a larger issue regarding how the CMB end of the department can be solidified. This is discussed in more detail under Criterion 6.

**Criterion 3 Teaching and Learning: Continuous Improvement**

Overall Findings: Met with Concerns (MC)

The department is meeting the evaluation criteria with respect to continuous improvement in undergraduate teaching and learning. Although not yet put into action, it has concrete plans to satisfy these criteria at the graduate level as well.

Appropriate mechanisms of learning assessment are currently in place for the undergraduate curriculum, consistent with the guidelines of UNM’s Office of Assessment. Learning outcomes in the four core classes for majors are assessed on a rolling basis, and the 100-level courses are assessed every three years. We were told that similar assessment mechanisms will be implemented at the graduate level in the near future. As indicated under Criterion 2, the graduate curriculum seems well overdue for a thorough department-level evaluation. Institution of a formal assessment mechanism will help point the way to the changes that are needed.

Assessment of the undergraduate curriculum has led to some significant and successful adjustments to the lower-level core courses. Notably, the lab for BIOL 203 has been shifted in orientation so that, rather than surveying biological diversity, it focuses on developing quantitative and critical-thinking skills relevant to the core material in ecology and evolution. The department notes in its report that students’ skills in formulating and statistically testing hypotheses has markedly improved since the change was made. More group activities and active learning have been incorporated into two other core courses, BIOL 202 and 204.

Indirect assessments of both the undergraduate and graduate programs are also planned, including exit interviews of departing students. We consider these very important to add and urge that an exit-interview process be designed and implemented as soon as possible.

Classroom teaching of untenured faculty is evaluated periodically by their two mentors in conjunction with the promotion and tenure process. Some junior faculty, however, expressed concerns that they are given relatively little direction with regard to teaching expectations, and mixed messages about the value of developing new course offerings in their areas of expertise. The latter point was also raised by the lecturers, some of whom would very much like to develop new upper-division courses. It was not clear to us whether, for the faculty, teaching is effectively peer-evaluated post-tenure. As discussed under Criterion 5, the department needs to revisit its annual review process, opening the opportunity for a yearly discussion with the Chair with regard to teaching roles, and to consider whether periodic teaching evaluations would be beneficial.

**Criterion 4 Students**

Overall Findings: Met (M)

With regard to undergraduate students, our comments are based on the self-study document, the information imparted by the Vice Provost, and general conversation with the faculty; we did not meet with any students directly. Undergraduate training includes hands-on experiences both in the lab and, for many students, in the field. In addition to developing strength in the discipline, students appear to have the opportunity to develop and practice the transferable skills that are so highly valued by employers today. Perhaps the best indication of the department’s success in producing more holistically-trained students is the fact that undergraduates appear to be moving on successfully to careers in which they use their biology training.

All advising is done by professional College of Arts and Sciences advisors who are physically housed in the Department of Biology’s space. Each advisor meets with students in multiple related majors, facilitating conversations about major choice and appropriate coursework. The college has a difficult time retaining advisors due to the much higher salaries for advisors in other UNM areas (e.g., Nursing). However, it appears that undergraduates in Biology are receiving quality advising.

The department has generally been successful in attracting excellent graduate students. However, this is not true across the entire department. Some faculty have struggled to attract their top candidates when other highly ranked programs nationally can make more attractive offers (e.g., high stipends, more years of fellowship support). Without additional resources, the most likely path to improved recruiting success is marketing. What are the factors that convinced current graduate students to enter the biology graduate program and, now that they are in the program, what are the most positive characteristics of the program, the university, the community, and the state? Similarly, what do alumni from the program value most about their time in the department? Highlighting this information and engaging graduate students and alumni as spokespeople could lead to improved recruitment outcomes.

We do want to comment specifically on the difficulties that the CMB faculty have in recruiting their top students. It appeared to us that the cellular and molecular biology graduate students represented a relatively distinct subdivision of the graduate program. With a small number of faculty, it will be difficult to compete with straight cellular and molecular biology programs. The unique opportunity for these faculty is that they are in a department with very strong ecology and evolution research. The competitive advantage of this department is to recruit students who wish to work at the interface of ecology and evolution with cellular and molecular biology. This would require a change in recruiting strategy and efforts to fully integrate CMB students, who may view themselves as a distinct and isolated group, into the broader graduate program.

We also wish to comment on diversity as it relates to graduate education. The culture in most biological disciplines is to refrain from recruiting or admitting students to the graduate program who receive their undergraduate degree from the same institution. The philosophy is that it is best for these students to go to a different institution to broaden their experiences. There is now growing awareness nationally that this culture results in a bias against diversity. Biology undergraduates from under-represented populations have learned to be successful in their current department. In general, their probability of obtaining a graduate degree is higher in that department than if they go to another institution. With this in mind, we encourage faculty to not automatically assume that discouraging UNM undergraduates from under-represented populations from applying to the department for graduate school is in these students’ best interests.

The graduate students were very pleased with the facilities at their disposal and generally very pleased with their experiences in the Department of Biology. However, there were a few concerns on which we would like to comment.

There was a clear consensus that, outside of learning how to conduct research and communicate their findings, professional development opportunities for graduate students are extremely limited (this issue also discussed in relation to Criterion 2). While this is a common concern across the country, the lack of professional development opportunities in the department seems extreme. As a first step, advisors should encourage students to take advantage of professional development opportunities that are already available through the Office of Graduate Studies and the Office of Effective Teaching. In addition, we encourage the department to consider implementing best practices from other institutions. For example, many institutions are providing graduate students proposal writing training including formal feedback on proposal drafts. This is not only a valuable career skill but frequently results in the students obtaining external grant support which only serves to make them more productive as graduate students. One step that can help in meeting the professional development needs of students is to reconnect with alumni. Tracking the career pathways followed by graduate alumni has become essential for guiding the leadership of a graduate program. Alumni can offer wonderful advice on what professional development should include from their own career perspective. Furthermore, alumni may be able/willing to participate in the professional development process. Making professional development a priority could help with the department’s recruiting efforts. Tracking and highlighting the career success of alumni is also key to recruiting.

While many graduate students are generally happy with their advisors, there are clearly some problem areas. While the graduate students applauded the department chair’s open door policy and felt comfortable bringing issues to him, it was apparent that students who are struggling with their advisor and/or the program are less comfortable approaching him. This is not at all uncommon, and why it is best practice to have an ombudsperson outside of the department to whom students can speak openly. The Graduate School indicated that this is a service they provide; however, the graduate students we spoke to were unaware of any options for raising concerns at other administrative levels. If it exists, then this information clearly needs to be conveyed more effectively to the students. If it doesn’t exist, this is worth adding. It is very costly both to a graduate student, to the faculty advisor, to other graduate students and faculty, and the department as a whole to allow problems to persist and fester.

Graduate students question the value of taking the long list of required courses when it comes at the cost of engaging in research earlier in their graduate career. While this is a rather specific concern (and is also discussed under Criterion 2), we point it out as a means of highlighting student concerns regarding the department culture. It is their understanding that policy changes, such as these course requirements, require unanimous approval by the graduate faculty. This perception, whether correct or not, leads them to conclude that it is pointless for them to suggest ways of improving their program.

**Criterion 5 Faculty**

Overall Findings: Met with Concerns (MC)

The Department of Biology faculty comprises a group of outstanding scholars. Individually and a whole, they are making fundamental contributions to their disciplines. They are a credit to UNM and all efforts should be made (and will need to be made) to retain them.

At present there are nearly 40 tenured and tenure-track professors in biology; the ranks include six Assistant Professors and two Distinguished Professors. Their scholarly scope is broad: they use both empirical and theoretical approaches to study hierarchical scales ranging from the cell to the biosphere, organisms from viruses to mammals, habitats from freshwater to oceanic to desert to polar, and processes from genetic to ecological to macroevolutionary. The department has long been known for its considerable strength in ecology, which is reported to involve about two-thirds of all faculty members. Expertise in ecology and its associated disciplines is augmented by the extraordinary resources of the Museum of Southwestern Biology and the Sevilleta Field Station and associated LTER program that the department manages (see Criterion 6). In recent years, these strengths have been augmented by those brought by newly recruited faculty in cellular and molecular biology. As discussed under Criterion 6 , state-of-the-art core facilities have allowed faculty in these areas to grow their research programs in directions that wouldn’t have been possible at the scale of start-up that the university currently offers.

The self-study report did not synthesize faculty strengths in a way that the committee found helpful. We urge the department to start keeping better records of individual faculty expertise and achievements (publication numbers and venues, awards, prestigious invitations, etc.), rather than pointing evaluators to >40 individual CVs (many of which were only biosketches) and to 27 Google Scholar webpages to obtain this information for ourselves. However, for several reasons we feel confident in concluding that the department’s scholarly breadth and depth meets the university’s expectations. First, we had the opportunity to discuss research with a number of faculty and their graduate students, and to see their facilities first-hand. Second, faculty publications/year has steadily grown since the last review, even as faculty numbers have declined due to departures and the retirement of three highly productive senior professors (including one member of the National Academy of Sciences). Over the past four years, publications and citations per faculty member have been on par with the department’s aspirational peers. We requested additional information that convinced us that most faculty are publishing regularly, some of them prolifically. Third, although grant dollars have declined somewhat in the past five years, most faculty are obtaining federal grants. There are of course individuals with more funding than others, but overall, nearly all faculty are actively seeking funding and succeeding in doing so. Finally, the large majority of faculty currently have graduate students in their labs, with a median of three and a range from zero to nine, suggesting that their research programs are thriving.

The faculty expressed strong enthusiasm for their department. Morale is high. They get along very well, have a strong respect for department chair Will Pockman, find the facilities adequate for their needs, and find the natural setting of the university and of Albuquerque to be a very strong plus for their careers. These, no less than the quantitative metrics, convinced us that this is a thriving group of which the university should be justifiably proud.

Yet, the committee detected a number of worrisome trends that threaten the continued health and stability of this unit. Many of these are linked to lack of university investment in hiring (marked by notably noncompetitive salaries and startup packages) and in retention. These issues are discussed in depth elsewhere in this report. Here we note some of its manifestations, which have led us to rank Criterion 5 as Met with Concerns.

First, faculty size has been static, even as the number of biology majors has dramatically increased. This has meant higher teaching loads for most individuals, just when it is taking more time for faculty nationwide to obtain the same grant dollars as in the past. Without faculty growth, the scholarly excellence of the group as a whole risks some erosion.

Second, the department has struggled to some extent in the hiring process. Compensation and particularly startup packages have not been competitive (discussed under Criterion 6), and a number of top recruits have chosen to go elsewhere. Higher salaries have been offered only when it has been thought to be essential to recruit a top candidate. As a consequence, individuals joining the faculty at nearly the same time have been hired at surprisingly different salaries, an unorthodox policy in our experience that is potentially destructive to morale, particularly among the junior ranks. Meanwhile, we did not see a comprehensive and strategic hiring plan in place. It is not clear when more faculty will be hired, nor what areas of biology the department is most excited about building if such an opportunity should be granted to them.

Third, a slowdown in hiring has been exacerbated by a relatively high frequency of faculty departures. Some faculty shrinkage was the result of expected retirements. We commend the department on retaining its productivity and scholarly excellence after the retirements of three prominent and prolific Distinguished Professors; this speaks to the quality of the new hires and to rapid growth in the research programs of many other individuals. However, other departures have apparently been stimulated by dissatisfaction with compensation packages. Notably, some of these individuals left with no competitive offer; they have moved either to untenured positions or to positions with funding agencies. Finally and most worrisomely, we are aware that some of the strongest faculty, including outstanding Assistant Professors, are fielding highly competitive offers from other institutions, or are beginning to look for such offers.

Taken together, one can make a fairly bleak projection. As discussed in more depth under Criterion 9, unless positive steps are taken in the very near future, the faculty is going to be smaller, older, and less productive by the time the next academic review comes along. It is also likely to be a less happy and functional unit than it is right now.

Securing the stability and healthy growth the department requires actions above the department level: offering salaries that are at least comparable to its peer institutions, offering competitive startup packages, implementing retention efforts that identify faculty at risk of leaving UNM and then proactively offering them incentives to remain, and, ideally, allocation of more faculty lines to biology. These issues are discussed in greater depth under Criteria 6 and 9.

However, the committee did identify actions that the department itself can and should take to foster faculty success and healthy growth.

* The department chair should meet with every faculty member after the annual review for an honest conversation about the past year. At this time the chair can gather information about the small steps that might be taken to prevent the kind of growing unhappiness that leads faculty to start looking elsewhere for employment. Sometimes it takes remarkably little investment to keep this from happening. The department chair also needs to take this face-to-face opportunity for frank discussions about individuals’ classroom teaching and graduate mentorship, which should lead to the development of plans to actively support faculty member goals and address weaknesses.
* The peer mentoring mechanism needs be reviewed, updated, and invigorated. At present its quality is inconsistent. Junior faculty need more feedback than they are getting about their progress towards tenure. The department relies on each individual’s mentors to convey this information, but, although evaluations are conducted in which the mentor is involved, very little is transmitted to the mentee him/herself. Mentors need clear guidelines about how to conduct this critical function. We note an inherent conflict in the mentorship process, as the two assigned mentors are involved in evaluating the mentee for promotion. The department might consider relying to at least some extent upon mentors from outside the department, as well as providing mentorship not only for research but for teaching as well. We urge the junior faculty themselves to develop a proposal for a mentorship program that would be the most use to them, and to initiate departmental discussions about it when ready. However, we believe that annual (or more frequent) meetings with the chair—with an annual letter as a follow-up clearly documenting the individual’s cumulative progress toward tenure—are where the most important guidance to junior faculty should be transmitted. Two of the members of this external review team are former biology department chairs. We have seen how formalized, clear feedback such as this is invaluable to tenure-track faculty and helps to protect units when tenure votes are not clear-cut. We strongly encourage the department to adopt these practices even if not required by the university.
* The promotion and tenure guidelines themselves need to be revisited and written policies put in place. There is considerable anxiety among the junior faculty that they do not know exactly what is expected of them either in terms of research productivity or teaching expectations. Promotion standards seem to be somewhat ad hoc, leaving room for bias.
* Departmental discussions are needed with regard to whether faculty who serve as curators at the MSB should be evaluated for their activities in their curatorial functions. At present, curation falls outside the scope of these evaluations, and indeed to some extent outside these individuals’ work descriptions. Unfortunately, this leads them to question why they are investing time and energy in their curatorial activities. This is not wise if the continued health of the MSB is a major department goal, which this committee feels it should be. This issue is addressed in greater depth under Criterion 9.
* The department needs to agree upon a plan for its next hires. We sympathize with the idea that, since no hiring initiatives are in the offing, there is no pressing need to develop such a plan. However, without one, they are left in a situation where they will not be ready if exciting opportunities do arise, as they sometimes do rather unexpectedly. Hiring plans need to be folded into larger and more consistent efforts to develop strategic plans for the department. Departmental retreats are the usual place for such discussions; however, these have been very few and far between. They should be conducted yearly.
* The department needs to develop a plan for how to recruit and retain more women faculty and more faculty from under-represented populations.

**Criterion 6: Resources and Planning**

Overall Findings: Met with Concerns (MC)

Findings on strengths:

The department has leveraged grant funding to create several enviable core facilities that support research and instruction. These include the Molecular Biology Core Facility, the Cell Biology Core Facility, the Center for Stable Isotopes, the Controlled Environments Core Facility, the Castetter Research Greenhouses, and the Castetter Animal Research Facility, as well as the Sevilleta LTER Field Station and all of the collection-based resources housed at the Museum of Southwestern Biology (MSB). These facilities serve the entire department, including researchers in areas far removed from those that originally helped to establish them. The core facilities also lower start-up costs for new hires by providing centralized, staffed equipment and support that eliminate the need for new investigators to separately create these capabilities (often at greater cost) within individual labs. The department, college, and university should make sure that there are plans in place for preserving and enhancing these core facilities.

UNM has hosted a Long-Term Ecological Research (LTER) site at the Sevilleta since the inception of that core NSF program (1988); it is currently one of only 25 such sites nationwide. LTER sites are productive research hubs that attract an international community of leading scientists. Key features of the NSF-LTER program are its substantial research infrastructure and long-term collection and management of environmental data. These features fuel the success of companion, standard research grants that leverage the LTER infrastructure to accelerate gains in knowledge and scholarly productivity. We were provided with documentation showing that UNM has netted $47,471,753 in research dollars from the Sevilleta LTER, not including the funds from the LTER award itself, which if included push this total to over $65 million. At UNM, the Sevilleta LTER site has attracted new collaborators and collaborative funding ventures from both Los Alamos and Sandia National Labs, as well as New Mexico State University, the Southwestern Indian Polytechnic Institute, the National Radio Astronomy Observatory, US National Park Service, and US Geological Survey. The Sevilleta LTER site is a statewide hub for education and outreach in the biological sciences, with a federally funded Research Experience for Undergraduates Site program, a nationally-recognized Field Station, a flagship K-12 Schoolyard Education program (bringing >3000 students to the field each month), and strong ties to the Sevilleta National Wildlife Refuge and Visitors' Center, which receives >13,000 visitors per year.

In similar fashion, the MSB has established an excellent reputation within the research community nationally. The museum’s collections-based research programs, the collections storage facilities including the liquid nitrogen facility for frozen tissues, and the number of research and collections-support grants received all compare very favorably with the top university research museums in the country. The MSB is a significant asset in attracting top faculty and students in evolutionary biology who in turn help the department deliver undergraduate courses that use a taxonomic focus to help students understand how the various conceptual disciplines in biology intersect. The museum’s collection is naturally very strong in the fauna and flora of the American Southwest. This focus has helped the museum’s curators, and the department more generally, develop strong ties to state government agencies – an important consideration at state supported institutions.

Findings on shortcomings:

Start-up funding. The UNM lacks a viable plan for funding the start-up packages needed to replace retiring or departing faculty with the high-quality hires needed to sustain the department’s current research productivity and extramural grant funding. As we illustrate below, under the current funding arrangements, the numbers simply do not add up.

*Due to the age demographics of the department, it anticipates 5-8 retirements in the next 2-3 years. Faculty on long-term leave also may not return. Let’s assume for this analysis that 6 faculty retire and 1 on leave does not return, resulting in a net loss of 7 faculty. Let’s also assume that they all leave at the same time, after exactly three years, and that faculty replacements are hired in time to start immediately after their departures. To replace these faculty, the university would therefore need to provide seven start-up packages in FY21.*

*For this analysis, we will assume that start-up costs will average $450K per hire, resulting in a total investment of $3.15 million in FY21 (7 startups x $450K each = $3.15 million). This is a conservative estimate. In its self-study, the department notes that start-ups over the past decade have been about $300K, but for the most recent hire the start-up was $425K. In the departments of the external APR reviewers, start-ups are routinely $500K or more, and we have had unsuccessful recruitment attempts with start-up offers exceeding $750K. This is the competitive landscape for hiring the best people. The start-ups reflect rising costs of doing federally funded research, the increasing use of more expensive molecular and genomics techniques in many subfields of biology (e.g., ecology, evolutionary biology, and behavior) and the increasingly difficult funding climate, where it is sometimes necessary to sustain new faculty on start-up for longer periods before they can successfully compete for substantial extramural grant funding. Nevertheless, the equation is still to the benefit of the institution, as a typical successful hire will generate more in F&A on grants over a period of several years than the original start-up investment.*

*Under the current F&A distribution model (branded as “Top Slice”), the department receives 40% of the F&A distribution returned to the College of Arts and Sciences after the OVPR takes it’s cut. We don’t have the exact percentage of the OVPR’s cut at this time, but the department states that this has recently exceeded 65%. For the sake of argument, we’ll assume a conservative figure of 66, and we’ll assume a constant amount of F&A generated by the department, based on the 2015 figure of $2.2 million. With these assumptions, each year the department would be expected to receive $2.2 million x 34% (the college share) x 40% (the amount of the college share returned to the department) = $299K. Over three years, the department would receive $898K. The College of Arts and Sciences would receive $2.2 million x 34% (the college share) x 60% (the amount of the college share retained at that level) x 3 years = $1.346 million.*

*The department provided conflicting information about how much of the F&A received is used for start-up. On page 43 of the self-study report, it says about 45% of the F&A is returned to centers (with negotiated F&A distribution agreements) and to individual PIs, based on a return rate of 25% of the departments F&A distribution. However, the allocations cited for FY16 (page 44) show over 70% of the F&A going back to PIs, centers, etc. A small amount was used to cover I&G-type expenses, and 29% was used for current and future start-ups. However, for the sake of argument, we will take the most conservative position possible and assume that negotiated F&A arrangements would remain in place (~20% of the department’s F&A, according to p. 43 of the self-study) but that the 25% PI portion would be eliminated (reducing funds available for graduate research assistants, research equipment, etc.) to help pay for start-ups in FY21. This would leave $718K (80% of $898K)*

*Under the current Top Slice model, the OVPR does not participate in funding these routine start-ups, and the burden for that falls on the College of Arts and Sciences (60%) and the department (40%). Thus, the college and department shares of the estimated FY21 expenditures of $3.15 million would be $1.89 million and $1.26 million, respectively. The department deficit would therefore be $542K ($1.26 million - $718K), and the college deficit would be $544K ($1.89 million - $1.346 million).*

*In other words, the true amount of funding available for start-ups in FY21 would be $2.064 million ($718K + $1.346 million), or $295K per start-up. However, this is an unrealistically conservative estimate. It relies on sharp cuts to the funding returned to PIs to support their research activities, and it assumes that ALL of the college’s retained portion of the F&A is plowed back into start-ups. Furthermore, start-ups of $295K would be at least $200K below what is competitive with the department’s chosen aspirational peers. It also assumes constant F&A generated by the department as faculty leave or retire, but some of these faculty are very well funded, and this is not a safe bet. As the department loses ground, its ability to fund start-ups after FY21 is likely to be further compromised.*

Based on this analysis, in the very near future, UNM is likely to fall far short of being able to provide the start-up funds necessary to compete effectively for replacement hires. **We strongly recommend that the department, college, OVPR, and provost’s office engage soon in developing a comprehensive, nationally calibrated plan for supporting faculty start-ups for new hiring.** As we discuss under Criterion 9, this funding will be needed retain the department’s nationally competitive position in publications and extramural funding.

Pre-award support: We heard a lot of concerns about current pre-award support for grant applications. These included horror stories about counterproductive actions taken by the institution (e.g., withdrawal of a submitted proposal without consultation with the PI) that have been deeply frustrating to Department of Biology faculty. We note that this is the complete opposite of the situation at our home institutions, where our pre-award offices function effectively and are viewed as extremely important partners by faculty. Many faculty at our institutions go out of their way to thank their pre-award staff for assistance on proposals, and they cite their pre-award support as a selling point for the institution during visits by prospective new faculty. At UNM, we believe that the perception and recent experience of faculty with pre-award has been of a regulatory, sometimes ineffective office rather than a service-oriented one.

The APR team had an excellent discussion with the University Controller, who oversees the pre-award office. We believe the goal is excellent customer service. However, we see multiple factors that appear to be limiting progress on these issues. We heard that the office has a very difficult time retaining pre-award staff, largely due to a very high-stress environment created by interactions with faculty who feel ill-served. Some of this also stems from changes in policies unpopular with faculty that have been set by the OVPR’s office but that must be implemented by the pre-award staff. In addition, there may not be effective enough communication to faculty about the impacts of workload surges near grant deadlines on these staff. Combined, these factors appear to be feeding a vicious cycle, with high turnover in staff leading to more errors, and with a lack of understanding on all sides harming morale.

These are serious issues needing attention, but we believe that they can be addressed. At this point, open dialogue is needed. Faculty and the pre-award office appear to share the same goals, but this may not be widely appreciated. We urge the Controller and departmental leaders to meet in person to discuss strategies for addressing these challenges and reforming the culture.

Strategic planning: The department has a plan for future hiring, but there does not appear to be a comprehensive plan for capitalizing on strategic opportunities and address long-standing challenges. The department, college, and central administration all agree that there is a mismatch between the research expertise of the majority of the faculty (ecology and evolutionary biology) and a large population of students seeking predominantly pre-medicine/pre-health-careers.

The research emphasis of the faculty, which is strong in ecology, makes strategic sense. The department has a strong national reputation in this area, and it has been extraordinarily successful in obtaining research funding for ecological work (e.g., the LTER site and associated research) and at recruiting and training high quality graduate students. The department and university have an outstanding record of success in capitalizing on unique aspects of this desert southwest location with two internationally renowned assets, the Museum of Southwestern Biology and the Sevilleta Field Station, that support ecology and evolutionary biology-related research and instruction.

To balance its strength in ecology and evolutionary biology with the need for faculty in areas that better support instruction of pre-medical and pre-health students (e.g., cell biology, molecular biology, and physiology), the department has attempted to establish a critical mass of cell and molecular biology (CMB) faculty. However, this has been a struggle. Because these faculty are competing for students with much larger CMB programs, which also have more graduate fellowships and higher stipends, the CMB faculty have a much more difficult time recruiting quality graduate students. At the same time, these faculty also face more of the brunt of the teaching needed to meet the demand for pre-health-related courses. All of these factors are likely to have a negative impact on CMB faculty recruitment and retention, and it is hard to see how they can be effectively addressed without dramatically shifting the balance in numbers between these faculty and those in ecology and evolutionary biology.

However, recent changes in the field of biology provide an opening for reconciling these seemingly mutually exclusive needs. More and more, faculty doing work in ecology and evolutionary biology use the same tools as cellular and molecular biologists. Therefore, the department should think hard about what kinds of hires (e.g., people studying how environmental change impacts, or the emergence and spread of infectious disease) might best build upon and contribute to its strength in EEB, while *at the same time* adding the ranks of its faculty who can support pre-health instruction. Ad hoc target of opportunity hires such as spousal accommodations, or hires to replace retiring faculty with people in the same field, may not be able to achieve this goal. The department needs a visionary plan.

Differential tuition: In our discussions with the UNM administration, we heard some interest in consideration of differential tuition, if this is at the level of STEM disciplines in the College of Arts and Sciences. Further exploration of this possible future avenue seems warranted.

Salary disparities among lecturers: UNM is to be commended for its creation of advancement opportunities for lecturers. However, given the current salaries of the Lecturers in biology, which are among the lowest on campus, it appears that the increase in pay associated with promotion will be almost entirely eroded by associated increases in health insurance costs and taxes. These salary issues need to be addressed so that promotions of the lecturers are not promotions in title only.

As noted in Criterion 5, at the tenure-track assistant professor level, there are some differences in compensation that have led faculty to apply for and interview for jobs at other institutions. These compensation issues should be addressed now, not after individuals have received job offers at other institutions. See Criterion 9 for a more general discussion of this issue.

**Criterion 7 – Facilities**

Overall Findings: Met (M)

The Department of Biology encompasses several spaces for research, teaching, program spaces and outreach activities in addition to the core building, Castetter Hall. The facilities description is highlighted on pages 49-52 in the APR Self Study. The External Review Team had the opportunity to tour several components of the facilities in the course of our visit. Additionally, the topic of facilities surfaced in numerous conversations with faculty, staff and students. This summary is based on all of the above input, and is subdivided into predominately teaching, program, and research spaces.

Spaces for teaching are found in several buildings, including Castetter Hall, CERIA and the Math Science Learning Building. Recent renovations have substantially improved conditions for teaching at the graduate and undergraduate levels, including the 2007 completion of the Castetter Hall basement renovation for classrooms and teaching labs and the more recent South and Southeast additions to Castetter Hall. Overall, the teaching facilities available for Biology are excellent. Many labs are new, and scheduling and shared spaces are adequate for the student loads. The undergraduate advisement area is conveniently placed for meeting student needs. The new additions have left older (1950s–1960s) space in core areas of Castetter in need of renovation- in particular the Castetter Animal Research Facility. This facility is operated with some financial support from UNM’s north (medical) campus and is critical for achieving compliance with animal care requirements for both teaching and research. The committee observes that renovating and consolidating all animal care functions into the large space on the eastern side of the basement region would provide optimal resources for care, safety and compliance. This facility is important for the ongoing research and teaching of the Biology Department as well as for meeting the needs of the medical campus

Program spaces for offices and conference rooms are also excellent. The new areas (South and Southeast additions) provide convenient groupings of areas for faculty, staff and graduate students, as well as common areas for conferences and seminars. Renovations in the older areas have also been effective. These areas are meeting the needs of the majority of constituencies.

Spaces predominantly used for research occur in Castetter, CERIA, Northrop Hall (Center for Stable Isotopes) and the Sevilleta Field Station. Institutional investment, and successful garnering of extramural funds by the faculty have provided an excellent facility infrastructure for research. Again, the renovations have provided critical new research lab areas that are highly prized and appreciated by faculty and graduate students. There are some concerns, however. (1) The recent NSF funding of the Sevilleta LTER is a major award, and should help with continued support of the Field Station, its core research facilities and its outreach capabilities. However, the committee heard many discussions on the use of F&A funds under past and present policies, and agree with the viewpoint that enhanced F&A return to the LTER effort would be a strong investment in ancillary research success. (2) Another research facility important to a core of Biology faculty is the Molecular Biology Core Facility (MBCF). The MBCF provides needed access to the tools and techniques of molecular biology for faculty and students and economically avoids duplication among labs as well as support and equipment to classes for teaching. This facility has had baseline funding through CETI awards to senior Biology faculty. However, there is a concern that as this long-term funding stream expires, there will need to be new support. (3) Although computational resources are extremely important to many facets of the biological research efforts, the Center for Advanced Computing Research is utilized as is a college-supported computer staff member, and research computing was not specifically highlighted as problematic. The bioinformation specialist is a staff position covered at present by CETI, so the future of this important piece is a concern. (4) The Museum of Southwestern Biology (MSB) entails a deeply-rooted leadership by core Biology faculty as well as a professional curatorial staff. Issues related to the disparate activities of the MSB are found elsewhere in this report, but the central facilities of the MSB are a core strength. The collections areas, teaching spaces and program areas are well-appointed and modern in design. However, MSB lacks a ‘public face’ at present. Such a space (a public museum) could elevate the recognition of this important research, teaching and outreach component of the department’s regional activities. These activities are important for the State of New Mexico, and elevating the visibility of these activities may help it garner financial support in the future.

**Criterion 8 Program Comparisons**

Overall Findings: Met with concerns (MC)

In our meetings within the department, we received the very clear and consistent message that faculty and staff do not feel that the department is valued by the university. In our meetings with representatives from administrative offices (the Dean, the OVPR, the Provost) we did hear a consistent message that people respected and valued the Department of Biology. That said, we could easily understand some of the concerns raised by the department. On several occasions, administrators we met with seemed to have a difficult time articulating specifics about the department, particularly with respect to its research achievements. We strongly encourage administration at all levels to recognize the gem that is the Biology department and to communicate to the department that this fact is recognized and appreciated.

We were asked to comment on whether institutional services, financial support and staff are sufficient to attract and retain well-qualified faculty. In general, the answer is yes, with two major exceptions (both of which were elaborated upon under Criterion 6). Probably the most disturbing thing we heard in our visit is the relationship between the grants pre-award office and the biology faculty. Here we will only point out that a positive relationship between the pre-award office and faculty is essential to the success not only of that faculty, but of a research university as a whole. Second, we wish to re-emphasize our concern regarding the retention policy of the college. The Department of Biology has been able to attract and support very productive faculty. However, having done so, the department is a target for recruitment. We were told by the faculty and Dean, that the college does not enter into formal discussions to retain faculty members until they have an offer from another institution. In our experience, this is a cost-effective policy when dealing with faculty who are good and who are applying to other institutions to better their current situation. It is definitely not a cost-effective or strategically-effective policy when dealing with outstanding faculty who aren’t actively applying but who are being approached on a regular basis by other institutions. Early intervention in such cases frequently results in a faculty member’s decision to withdraw from consideration after modest adjustments to salary and/or working conditions.

We were very impressed with the research infrastructure in the department. However, our understanding is that much of this is the result of external federal funding obtained by the faculty in the department. As federal funding becomes increasingly difficult, made more difficult by the unresolved pre-awards office issue, the infrastructure on which faculty productivity (publications and grants) depends will be unsustainable. The ability to acquire, maintain, and operate research infrastructure is compromised further by the decision of the OVPR office to change the indirect cost distribution model. This decision represents a disproportionate budgetary cut to one of the most productive and prestigious departments, not to mention of university’s most successful department in bringing in indirect costs.

**Criterion 9: Future Directions**

Overall Findings: Met with Concerns (MC)

Findings on strengths:

The department has a strong sense of shared purpose and community. While faculty morale is very poor regarding if and how the university appreciates the department (see below and under Criterion 8), we were struck by how robust the department is internally. We heard near universal positive comments about the department from graduate students, staff, and faculty at all ranks (from lecturers, to assistant professors, to the senior, distinguished professors).

The department, college, and upper administration all recognize that the Department of Biology fulfills a very important role in serving the university’s teaching mission. In addition to serving a large population of biology majors, the department also offers courses needed for the general education curriculum and for supporting the needs of the large population of students seeking human health-related degrees. It is also widely acknowledged (by faculty and administration) that the department’s success is integral to the success of at least one other unit on campus (the Department of Chemistry and Chemical Biology) due to a strong reliance on the Department of Biology’s course offerings. In addition to its tenure-track/tenured faculty, the departments has a strong, committed team of lecturers who are critical to supporting the department’s teaching mission. The department and the college clearly view their contributions.

The department has an exceptionally strong record of research. All the external reviewers for this APR come from Carnegie R1 institutions with strong reputations in Biology. The UNM Department of Biology meets or exceeds the performance of our home departments in terms of publications, funding, stature, and the size and quality of its graduate program. The current faculty, and recent retirees, including individuals who are some of the most prominent scientists in their fields.

The Sevilleta field station is a large part of the department’s success, and the recent approval of continued LTER funding is a major coup that capitalizes on the department’s historical strengths and strategic location in the desert southwest. The natural history museum is also a nationally recognized museum that is a strategic complement to the department’s traditional research strengths. The department has been very successful with some of its recent tenure-track and mid-level hires.

Findings on shortcomings:

Looking to the immediate feature, all members of the external review team share deep concerns about issues that will need to be addressed soon for the department to avoid a sharp downward trajectory. Without an effective strategic plan and sufficient institutional support and intervention, we think UNM’s Department of Biology is likely to enter a downward spiral in the quality of faculty that it can recruit and retain. Our assessment is based on the following six factors.

First, several members of the department’s faculty will be retiring in the next few years (with 5-8 likely in the next three years). Collectively, these faculty represent approximately one-quarter ($2.6 million) of the active research funding in the department. They are responsible for a large amount of the research activity and graduate student mentorship in the unit, and they provide support for core facilities (the Sevilleta field station and the molecular biology core facility) that are major selling points for faculty recruitment and retention, and for marketing of the graduate program.

Second, several faculty have records that make them highly competitive on the national job market and have been interviewing for positions this year. Others are in the process of leaving (or have very recently left) the institution. Two additional faculty are on long-term leave (with uncertain prospects for their return). The actively departing or on-leave faculty collectively have $900K in active research funding.

Third, as we have emphasized repeatedly, the college and university have a reactive rather than proactive strategy for faculty retention. Instead of identifying factors that may lead top performers to seek positions at other institutions, these faculty appear to be told that they must receive offers from other institutions before UNM will offer a retention package. Furthermore, the interviewing faculty member and department are subjected to a demoralizing polling process to see whether the department wants to keep that individual. This approach is very short-sighted, as faculty who have taken the time to enter the job market already have one foot out the door, and any retention offer at that point is often too late. It is also likely to be more expensive over the long term, because it costs much less to address faculty concerns before the university enters a bidding war with another institution. Given start-up costs, it is also a lot less expensive to retain someone than to hire a replacement.

Fourth, the department has not engaged in serious strategic planning, particularly with respect to hiring. Aside from its accurate self-assessment that it is a high-performing unit, the department has not prepared an effective argument for why future support from the central administration for faculty hiring would be strategic and an excellent return on investment. As part of its strategy to obtain stronger institutional support, the department needs to consider how to better balance the instructional needs of a large population of pre-medical and pre-allied health students (e.g., nursing) with a strategic faculty research strength in ecology. The department may be able to address these *seemingly* mutually exclusive needs by strategically emphasizing hiring that covers both areas, such as those we point to in our discussion of Criterion 6. Such hiring can and should capitalize on the department’s unique strengths and geographical location. Given the department’s excellent record of extramural funding and its very strong national/international reputation, we believe the department could develop a compelling plan.

Fifth, the university has set a course of sharp disinvestment in faculty hiring. The “top slice” program inherited by the current OVPR leadership, and a recent record of poor service by the university pre-award office, has severely damaged faculty morale and faith in the institution. This program was effectively a steep cut in central administration support for faculty start-ups, with the near complete withdrawal of the OVPR’s office from participation in funding start-ups. The unfortunate branding of this budget cut with a catchy name, “top slice”, has only reinforced the faculty perception that the university is out of touch with what is needed for the institution to remain a Carnegie R1 class institution. Based on the current job market nationally (and experiences in our home departments reinforce this point), UNM needs to be prepared to provide $500-$700 per hire to recruit top talent. If the university hires well, these investments will pay off, with the typical successful new hire bringing in more than that amount in F&A support over time. However, if the university continues its divestment in the support of start-ups, the department will not be able to generate the necessary funds to compete for the people capable of performing at that level.

Sixth, the university also appears to have backed away from leveraging a significant portion of its F&A funds to support existing and strategically important assets and to develop new ones. A case in point is the recent (successful) LTER proposal. The previous LTER grant was leveraged into $47 million of additional funding for the university, with $24 million in additional F&A. A relatively small reinvestment of the LTER F&A was a critical piece of that success. However, that support was not provided for the latest LTER grant. We note that the withdrawal of the OVPR’s office from most initiatives that seek to leverage relatively small reinvestments of indirect grant dollars into much greater future returns is completely counter to what each of our institutions is doing. Without an aggressive approach to supporting promising research initiatives, it is hard to see how UNM can continue to compete as effectively as it has for grant funding.

Seventh, while morale is generally positive in the MSB, this was one of the few focal points where we did hear evidence of significant internal dissatisfaction and need for internal departmental reform. As mentioned above, the museum is a tremendous asset for the University and the Department of Biology. The collections attract significant research funding and make it possible to teach about biological diversity in a way that just isn’t possible at institutions that lack a resource of this quality. The taxonomically based courses that are taught using this resource are easy entry points to the biological sciences for many students: they provide field experiences (the ultimate in active learning) and are great for integrating the complex concepts that are taught independently in conceptually-based courses. However, these collections require curation. While collection managers can handle many of the day-to-day collection activities, experiences at other institutions nationally have demonstrated that collections require the involvement of researchers (faculty) if the institution is to realize the benefits of having a collection.

Curatorial searches were conducted, and faculty/curators hired, with the understanding that they would in fact be responsible for curating collections. However, curation is explicitly not part of their job expectation, nor are their curation efforts evaluated as part of annual or promotion performance reviews. This is definitely not considered a best practice in university natural history museums nationwide. The team is unaware of any other university natural history museum with significant collections in which curation is not part of the curators’ job responsibilities. If the current situation persists, it is very likely that it will become difficult to retain these high performing faculty and/or the “curators” will abandon their currently altruistic efforts to do what is best for the collections and museum. In either case, the MSB will likely decline from its current postion of excellence in the coming years.

We view it as essential that the curators have an explicit expectation that they be involved in curation and that the Museum Director be their supervisor for that portion of their effort. Determining how to accomplish this change in job expectations is clearly outside of our charge. The solution will likely arise out of discussions between the MSB, the Department of Biology, and the Dean. We can, however, offer some suggestions from other institutions that might help launch those discussions. At most institutions, curators are evaluated not only according to Research, Teaching and Service, but according to a fourth category, Curation. The percentage effort in Research and Service for a curator is the same as for a faculty member of comparable rank, but the Teaching effort is reduced by 50% and Curation effort is set at the same percentage as teaching effort. Some modification of job expectations to include an explicit requirement that curators spend time on curation is the cleanest solution.

An alternative that could be considered is to pay curators two months of summer salary to curate (while recognizing that curation is actually a year-round activity). This isn’t ideal because it prevents curators from being able to seek summer salary for research activities – effectively disadvantaging them relative to their non-curator colleagues. Another alternative to consider is a salary augment for curators. This approach is preferable to the summer salary approach because it doesn’t prevent curators from seeking summer salary on external grants. However, it does have the drawback that it acknowledges that curators are being asked to do more than their non-curator colleagues. Regardless of the solution that is ultimately decided upon, the future of the MSB depends on curators having an explicit expectation that they will curate, that they will be compensated appropriately for that effort, and that the museum director will be an active participant in their annual and promotion review process.

If left unaddressed, we believe that the above set of seven factors has the potential to create a perfect storm. Currently, the morale *within the department* is very high, and most faculty are not eager to leave. However, morale related to the university’s support of the unit is abysmal, and the unit’s faculty are deeply concerned about the lack of a plan to fund start-ups and to invest in research. The upcoming retirements will soon test UNM’s ability to respond. If the department is unable to hire promising new faculty to replace them, then other current faculty with the ability to jump ship may begin to do so, and with increasing urgency and frequency.

Once a vicious cycle like this begins, UNM may not be able to reverse course, and the department may cease to be a nationally recognized powerhouse with the level of extramural funding that it has now.