Dear Search Committee,

I am writing to apply for the position of Head of Ecology, Evolution, and Behavior (EEB). I believe that I could contribute to this already strong department both through my science and my leadership. As the application asks for leadership philosophy, research interests, and educational / mentorship experience, I will address each of these in turn.

Especially in an academic department, leadership means learning from people and listening to their suggestions. This is clearly necessary for an external head coming into a department like yours. A new perspective can suggest new approaches or identify undiscovered problems, but there is a whole web of social interactions, constraints, and past attempts that can be learned from. Part of this is recognizing the scale of the department – there are long serving administrative staff, shorter term postdocs, grad students, undergraduates, and faculty, and I would expect ideas about what to sustain and what to improve should come from all of them, especially in areas relating most to their own lives. One emphasis in the job advertisement was democratic decision making in the department. This aligns very well with my leadership approach, especially if the people influencing decisions include groups beyond faculty. For example, having graduate students serve on committees relating to department policy (with possible exceptions for committees dealing with confidential data of other students) is important. Graduate students generally lack the experience of faculty (though this is not necessarily the case given more diversity in the age in which graduate students start school), and individually stay in a department for far less time than a typical faculty member, but gaining institutional experience is arguably more important for their future careers than it is for already established faculty. From a purely numerical perspective the 60 graduate students outnumber the 41 core faculty in your program, and this pattern will persist even as the individuals rotate through. So, it is essential that representatives of both these groups, and other people in the department, have a voice that is respected. This listening, democratic approach also means that goals are bottom up. In other words, I would not come in with a view that "UMN EEB must be a leader in convergence research in ecological and evolutionary response to climate change" or some similar mission but rather try to find how all the excellent, passionate people in the department can be helped to achieve more of their individual and collective goals.

A key issue in academic leadership, at any level, is awareness of power dynamics. Ecology, evolution, and behavior tend to be outwardly egalitarian. On ant collecting trips with my PhD advisor, we camped in the same place, ate the same food, wore the same sort of clothes, had similar equipment around our necks. But, we were not equals. He had (and still has) far more knowledge about finding ants in the field, their natural history, and their taxonomy, but the overall impression would be of people near the same level. A bad letter from him would have sunk my chances of a good postdoc, and perhaps my chance of getting a faculty position later. Science is rife with these dynamics, often unavoidable. For

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example, non-tenure track faculty member is dependent on those who decide their employment contract by contract, an undergraduate assistant depends on their grad student mentor to put a good word in for them with their faculty member, an assistant professor's tenure depends partly on evaluations from tenured peers at other institutions. None of this is wrong, but it is essential to recognize these dynamics to ensure that the people with less power in the relationship are protected and have effective, trusted ways to seek help. In my current role as an associate department head I have helped resolve situations and have also directed people to internal and external resources. Part of this is also making sure everyone knows the resources available to them. All universities have people who abuse power; a noteworthy aspect of U. of Minnesota is that through some combination of good journalism and university transparency there are public reports of incidents and resolutions (https://academic-sexual-misconduct-database.org/incidents?query=minnesota) that give survivors some indication of how investigation and sanctioning can occur, allowing relevant groups to work to earn their trust. Within my field, I have worked as a member of the code of conduct committee for the three societies that put on the Evolution meeting (Society of Systematic Biologists, Society for the Study of Evolution, and American Society of Naturalists) for the past few years to help create a more welcoming climate. Working with this team, I have helped design and get IRB approval for a survey of hundreds of past attendees, wrote up and presented the results, craft fair enforcement procedures for the meeting code of conduct, wrote transparency reports on events and sanctions, and start the Evo Allies program. These are some of the concrete steps I have taken to make my current department and my field more inclusive so that all people are welcomed and can thrive.

An increasingly important tool in university leadership is the use of metrics, though these can be very easy to abuse. We have all seen the impact of chasing citation counts, US News rankings, and the like. There is even Goodhart's Law in economics: "When a measure becomes a target, it ceases to be a good measure." It is clear that your department has largely avoided this trap. Cedar Creek and Itasca are clearly fantastic places for research and teaching, and have substantial impacts on both (for example, 2500 student papers from Itasca alone), but they are not going to budge U. of Minnesota's overall university rank or attract research spend from NIH. Your department obviously gathers data to use to advocate for and defend these resources, but their value is deeper than those numbers. However, metrics can be important in detecting and correcting issues. For example, in my current department I created a system for graduate student annual reports, where they fill in information on their desired career path, papers published, committee meetings. I wrote software that easily generates a report for the student, their advisor(s), and graduate affairs as well as aggregates information across all students (see Fig. 1). This helps foster discussions about whether students are on track to meet their goals, but it also helps flag problems early enough with automatic warnings to allow for adjustments. For example, like your department, we require Ph.D. students to pass their preliminary written and oral exam by the end of their fifth semester, but

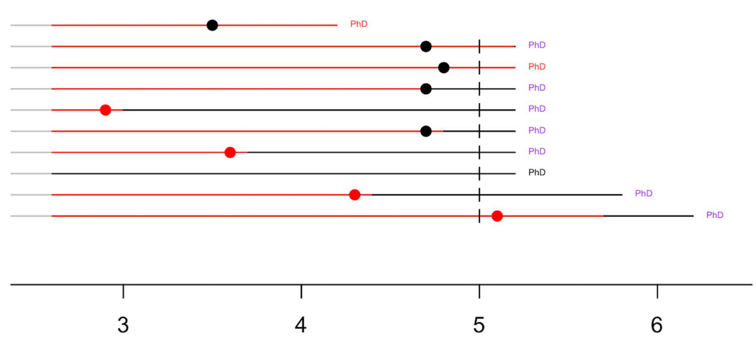


Figure 1: Detail of figure used for graduate progress reporting (with student names removed), generated using a form and software I developed. Student-entered data is processed and individual reports constructed flagging any potential issues; there is also an overview plot showing students who have not taken their qualifying exams on schedule (red lines) and dots showing when their most recent committee meeting was (black dots if within the last year, red otherwise).

this was not happening for all students – this now gets flagged automatically, as do students who have gone over a year without a committee meeting. With 50 (as in our program) or 60 (as in yours), each with a committee and advisor(s), such issues should not slip through, but this provides another check to make sure students are on track. We can also use data to actively push back on metrics. For example, there is substantial peer-reviewed evidence that student numerical evaluations of teaching can be biased against instructors of various backgrounds. We now note this in our evaluation of faculty for retention and promotion and tend to emphasize the more qualitative, but hopefully less biased, assessments of peers. [Note that, based on my reading of your evaluation of teaching policy, it seems you also recognize the importance of peer evaluation and potential issues with student comments (e.g., you allow deletion of "offensive, racist, sexist, homophobic, and other personal comments" in students' rating of teaching before the instructor is evaluated).

My history of leadership positions includes my current position as one of two associate heads in our Ecology and Evolutionary Biology department, head of our graduate admissions committee, service on various college level committees (Dean's advisory council, strategic planning committee), member of our own department head search committee, and similar. I have also been an Associate Director, and thus part of the leadership team, for postdocs at the National Institute for Mathematical and Biological Synthesis (NIMBioS). I have served on the council and as the first communications director for the Society of Systematic Biologists and serve on the Code of Conduct committee for the three evolution societies (SSE, SSB, ASN).

My research addresses key questions in macroevolution for understanding the processes leading to present diversity and disparity across life. I do this through development of new approaches and the implementation of open access software and applying these techniques to compelling biological questions. Particular areas of focus include factors affecting diversification rates, including the effect of traits interacting, including unsampled traits. I also work at the phylogeographic scale, where the distinction between populations and species becomes uncertain but important for conservation. A common theme is on methods that allow discovery. An increasingly frequent approach in evolutionary biology is to compare a model that has an effect someone hypothesizes exists (say, that a pre-specified trait increases speciation rate) with a simpler, uninteresting model (i.e., that the speciation rate is constant through all time), find that the more complex model fits better, and conclude that one's hypothesis is justified. Biologists are generally clever and know their study systems well: it is likely that the hypothesis they are testing is correct, and it is just a matter of having power to reject a null model to find a significant result. But, in my view, this prevents surprise and actual learning. I have seen some of my earlier work, which has methods that allow estimation of rates of evolution, long term evolutionary optima, and other biologically relevant parameters, often be used in dull or trivial hypothesis rejection in this way: are two different groups of organisms (different trophic levels, different life styles, etc.) evolving at exactly the same rate, for example. Darwin's great insight was that variation exists all through life: we know that two different groups are not going to be exactly equal for almost anything, so testing for the presence of difference, while framed as hypothesis testing and rejecting of nulls, does not really tell us much about biology. I have pursued projects that push the field into estimating the magnitude of parameters, which can reveal much more about the underlying evolutionary processes, as well as methods that generate new ideas not just lower p-values.

My current work is in a few different areas. I am working with colleague Jeremy Beaulieu on a newly funded NSF grant on testing a hypothesis about what leads to different amounts of diversity. In paleontology, it has long been known that extinction rate is generally very similar to speciation rate, but with modern data we often find extinction rates much lower than speciation rates. Biologists are cautious about using these inferred extinction rates, but do happily take the difference between speciation rate and extinction rate — the net diversification rate — and study which taxa, and/or which traits, have led to high diversification rates. However, in paleontology, a different question has been looking at species lifespans – how long a species persists. Doing a direct comparison between how "species" survive in the fossil record versus recent species is problematic, as the entities are different: we can more finely divide species in the present given the richness of data on differences in color, song, hybrid fitness, and more which do not fossilize well, and in paleontology a species can disappear because it gradually evolves into a different species, but this is not really an extinction. But the idea that species "lifespan" matters for patterns finds echoes in our observations of modern data: groups like orchids have high speciation rates and high extinction rates (precise pollen placement and specialization on pollinators allows for rapid speciation but also increases extinction risk), while *Amborella*, sister to all other flowering plants, neither speciates nor goes extinct. There are many traits that seem like they would jointly increase speciation and extinction rates: anything that increases reproductive subdivision, such as reduced dispersal (loss of flight, loss of planktonic larvae, gain of precise pollen placement, rapidly evolving courtship signals, living on islands) would have this effect. We have tried to have people examine this by looking at the sum of speciation and extinction rates (turnover rate) in our HiSSE model (Beaulieu & O'Meara, 2016), but with this new work seek to test this hypothesis more generally. An obstacle is that there is widespread, and often justified, concern about speciation extinction models in general and, we believe, uncorrected bias coming from which sets of taxa scientists choose to study, so as part of this we are developing better methods to deal with these concerns. Another ongoing project (funded from a CAREER grant, now winding down) is to develop more flexible comparative methods. Most methods require a mathematical formula in order to calculate the likelihood, and creating that can be difficult. For example, my first major claim to fame was making a Brownian motion model that could allow multiple rates over a tree rather than just one (O'Meara et al., 2006) – it was an important advance that led to answering several compelling biological questions, but it took much work to get essentially a simple expansion in the number of parameters. Approximate Bayesian computation is a way to get the likelihood by simulating – rather than using a formula to calculate the probability of seeing data, you simulate many data sets, find out how often you get your actual dataset, and the proportion of times your simulation results in your empirical dataset is the probability of getting those data under that particular model (there is important nuance in how close a simulated dataset has to be, and how exactly you measure the match, that I am skipping here). This project allows scientists to make a simple idea of how they think their species may evolve in a single time step: "change mean by a certain amount, but in a direction away from close relatives," for example, make a way to simulate this, and then put it into a framework that allows parameters of the model and all the nuance of how to evaluate matches be estimated automatically. I also have ongoing projects on delivering dated trees of life, comparative methods on a phylogenetic network, and more.

One note about my CV: my lab's standard for authorship is high: substantial contribution to papers is necessary. Thus, my research group as a whole has much higher productivity than the work I claim for myself – for example, in 2015-6, people affiliated with my lab (two postdocs and a Ph.D. student) published three papers in *Science* (cichlid jaws leading to cichlid extinction in Lake Victoria; evolution of locomotion on land; evolution of creationist legislation) but I am correctly a coauthor on none of them.

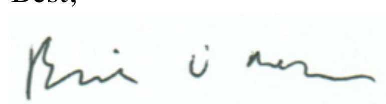
For educational and mentoring experience, I have graduated four Ph.D. students (one of these was coadvised with Susan Riechert). One applied to my lab directly; another joined after his original advisor left; another added me as a coadvisor, then switched entirely to my lab; and a fourth started off entirely in someone else's lab then added me as a coadvisor. This history shows the importance of allowing students to seek new advisors as their interests change (or as they find better advising styles), something your program also allows. Two of my students are pursuing an academic track (one with a postdoc at U. Michigan working on fish phylogeny, one with a postdoc through Los Alamos National Lab (but primarily housed at U. Idaho) working on diversification model adequacy). Two others decided to pursue careers in business, getting a Masters in stats while also pursing their PhD and going on to find jobs they enjoy in areas near family. Academia has long trained people for a variety of careers: for example, of 71 PhD graduates UMN EEB from 1978 to 2012 (this is based on your alumni directory, which last has entries from graduates in 2012), 35% of your graduates are in tenure track academic positions, while nearly 10% are at government positions (such as the US National Forest Service or the EPA), and 8% are at NGOs such as the Lincoln Park Zoo or the Nature Conservancy (plus a large fraction who are reportedly postdocs, though they presumably have moved on to more stable positions). I have thus been working at my current institution to move from having a default path of tenure track academic jobs to ask, and prepare students for, the careers they want (my efforts include writing training grant proposals to NSF, making structural changes like forms asking students for their desired career paths to prompt this discussion with their advisors, and bringing in speakers from a variety of careers. I have also mentored 16 postdocs directly: 7 from my own grants or startup, and 8 as one of two advisors for them for the National Institute for Mathematical and Biological Synthesis (NIMBioS), and one funded from both sources, as well as more general mentoring for more as associate director for postdocs at NIMBioS. An important aspect of mentoring postdocs is getting them ready for the next phase and being available to give them support, especially for those going into academia who must navigate the difficult process of negotiating a position and starting up a new lab.

For teaching, I routinely teach an upper level undergraduate / early graduate course in macroevolution (http://brianomeara.info/eeb464.html) as well as a graduate level course in phylogenetic methods (http://phylometh.info/).)”). The macroevolution class covers everything from game theory to disease evolution to mass extinctions. My objective is to focus on what students will retain a year or more after taking the course. I will provide details, but my main emphasis is on them understanding the as well as broader questions. Classes are a mixture of discussion of students in groups, class-wide discussion, some student presentations, and slides from me to deliver basic facts and inspire discussion. Slides for each class are made freely available online before students arrive, and faculty at other universities have adopted these slides for their classes. I also include student-choice lectures, where the class brainstorms what topics in macroevolution they are most curious about and I then prepare classes on these. These have included evolutionary medicine, evolution of aggression in humans, dinosaur evolution, and more. Opening the class up this way lets students guide it towards topics they find most compelling while making sure they apply macroevolutionary thinking to these topics. The graduate class is a flipped course where students watch short lectures and do readings outside of class and inside class, we work through what was difficult in the background information and exercises. Later in the semester, students start working on projects of developing an approach themselves to answer a question. Sometimes this becomes a part of a student's dissertation; more frequently, it remains as a class exercise only. In biology, graduate students often just use methods as black boxes without understanding the underlying assumptions; by developing their own methods, they realize the compromises one has to make and encourages more skepticism. I also frequently teach at workshops. For many years I have been one of the instructors at Steve Arnold and Joe Felsenstein's Evolutionary Quantitative Genetics course as well as one-off workshops at conferences, and I will be launching a new workshop with collaborator Jeremy Beaulieu this summer on comparative methods.

Overall, I believe I have much to offer your department as its head. I recognize its areas of excellence and would work with the community to identify areas where there could be improvement in a collaborative, democratic process. My incentives align with those of the department: I value compelling research and effective teaching and want to see it continue to thrive, and, as a midcareer scientist with many years until retirement I would want to make sure that, after my term(s) as head conclude, the department I would have helped to tend and grow remains a great one to be in. My research and teaching would complement the work going on the department already; for example, I have collaborated with Jeannine Cavender-Bares in a NIMBioS working group, book chapter, and other work and would have similar synergy with several people in your department. One other note: from our own head search process, I have seen some of the ways this can go awry (though ours fortunately resulted in an excellent head at the end). One issue was candidates who were good on paper, and even in person, but who were only using the process as a means to get a counteroffer from their home department. This is not my goal – I am understandably serious about this great position and will be honest about my thinking throughout the process. That said, I do not want to overpromise anything: without getting into details, my personal views are not the only ones relevant to a decision on a cross country move.

Please do not hesitate to contact me with any questions, and thank you again for this opportunity. Below I have provided contact information for three colleagues that can give added perspective regarding my qualities for this position. Note I am attaching the requested example scientific reference to this document in the HR submission portal.

Best,



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