Intellectual Merit Criterion

Overall Assessment of Intellectual Merit
Excellent

Explanation to Applicant
The applicant has excellent academic record and relevant research experience through past and current research position. He received a BS in Microbiology from the Northern Arizona University in 2014 and enrolled in the PhD program at the same institution. He has coauthored one peer-reviewed publication and one more is in review. He has multiple presentations in regional and national meetings. He has glowing recommendations from his references attesting to his excellent research and academic aptitude. The applicant proposed to investigate how conservation of species can be informed through diet and microbiota using molecular tools, using jumping mouse as a case study. His has the required skills and resources to complete the proposed work and I am confident that he will be successful in graduate school. However, his proposal demonstrates very methodological approach and he starts describing aims before asking any questions or defining hypotheses about this work. I would recommend taking a step back and think carefully about the questions and hypotheses.

Broader Impacts Criterion

Overall Assessment of Broader Impacts
Excellent

Explanation to Applicant
He is committed to engage students in this research and will use existing collaborations to disseminate results.

Summary Comments
The applicant has excellent academic record, two peer-reviewed publication, glowing letters, and a good proposal. He is committed to engage students in his research. He has required skills and training to finish the proposed research and I am confident that he will be very successful in graduate school.

Intellectual Merit Criterion

Overall Assessment of Intellectual Merit
Excellent

Explanation to Applicant
The candidate has a very strong academic record from Northern Arizona (3.8). Impressively the candidate has supportive letters of recommendation. There are multiple oral and poster presentation and two publications, one win PLOS one. The candidate has provided clear evidence of their previous and current success in the STEM fields and is likely to continue to engage the field and enrich the STEM fields.

Broader Impacts Criterion

Overall Assessment of Broader Impacts
Excellent

Explanation to Applicant
In regards to broader impacts the candidate has a record of achievement in disseminating science and engaging and participating in science events. The presentations and publications are a great first start. However, we also see a record of engaging others in

science and STEM fields and promotion of the field as a whole.

Summary Comments

Overall the candidate presents a very strong record of achievement in regards to intellectual merit and broader impacts. The candidate shows a record of success academically, in letters and in presentations and publications that is likely to continue with support. With regard to broader impacts the applicant has already established a record of community impact and engagement. This application and applicant is competitive in the pool.

Intellectual Merit Criterion

Overall Assessment of Intellectual Merit

Excellent

Explanation to Applicant

This is an interesting proposal that develops tools to help guide management of an endangered species, the meadow jumping mice (Zapus hudsonius luteus) by revealing, using non-invasive molecular techniques, the diet of the species. While I am supportive of the role of management-driven research, I think the proposal would be more in the spirit of a NSF graduate research fellowship if it could be cast more in a framework of basic ecological theory. As is, it seems more like a proposal to develop a method that will have broad ecological applicability. For instance, while the metabarcoding tool will help identify plants consumed, there seems to be no thought to assessing plant species available in the areas of interest, nor in calculating some sort of index of selectivity, both of which seem critical to use the diet information in the way the proposal advocates - i.e., to guide management of habitat to ensure adequate food resources for this endangered species. For future proposals, please keep in mind that strong ecologically-framed hypotheses or hypotheses created in a strong ecological framework, will be more compelling.

Broader Impacts Criterion

Overall Assessment of Broader Impacts

Excellent

Explanation to Applicant

Broader impacts, which include sharing results with appropriate agencies, and mentoring an undergraduate student, are strong.

Summary Comments

This proposal will develop a non-invasive, molecular approach for characterizing the diet of the endangered meadow jumping mouse. The proposal would be stronger if it were developed with a more explicit ecological framework. While the work will undoubtedly be valuable for management of the meadow jumping mouse, and will also have broad applicability beyond that species, a more explicit ecological framework would be more compelling and in the spirit of the NSF graduate research fellowship. Broader impacts, including mentoring and sharing results with several appropriate agencies, are strong.