



## Academic Program Assessment Report for AY 2023-2024

Program: BS Wildlife and Natural Resources

(Due: **June 1, 2024**) Date report completed: 6-12-2024

Completed by: Trumbo

Assessment contributors (other faculty involved): Ramos, Sandmeier, Diawara, Garcia-Costas

Please describe the 2023-2024 assessment activities and follow-up from prior years for your program below. Please complete this form for each undergraduate major, , and graduate program (e.g., B.A., B.S., B.A.S, M.S., DNP, etc.) as well as stand-alone minors, or certificates in your department. Please copy any addenda (e.g., rubrics) and paste them in this document, save and submit it to both the Dean of your college/school and to the Associate Provost as an email attachment by June 1, 2024. You'll also find this form on the assessment website at <https://www.csupueblo.edu/assessment-and-student-learning/resources.html>. Thank you.

### Brief statement of Program mission and goals:

The Biology Program provides the biological component of the liberal arts education. We promote student understanding of biological concepts relevant to the individual and society, and foster an appreciation of scientific inquiry. Biology is an integral subject for other majors' requirements and the Biology department is committed to fulfilling these service courses and general education for other departments.

The major of Wildlife and Natural Resources leads to a Bachelor of Science (BS) Degree. In addition, supporting courses and general education courses in biology are available to meet a wide range of interests, backgrounds and needs. The Wildlife and Natural Resources Program emphasizes an understanding of fish and wildlife ecology and management with practical skills obtained during laboratory and field exercises. Graduates are prepared for positions with state and federal agencies, tribal departments, and conservation organizations or higher academic degrees. Carefully supervised career planning is provided to all students.

### Program Goals:

- To provide students with the necessary background to successfully pursue graduate study towards a professional career in wildlife and natural resources;
- To prepare students upon graduation to enter field positions in government or private industry; and,
- To supply students with the necessary coursework to obtain professional certification as associate fishery or wildlife biologists.

**I. Assessment of Student Learning Outcomes (SLOs) in this cycle.** Including processes, results, and recommendations for improved student learning. Use Column H to describe improvements planned for 2023-2024 based on the assessment process.

| A. Which of the program SLOs were assessed during this cycle? <b>Please include the outcome(s) verbatim from the assessment plan.</b> | B. When was this SLO <u>last</u> reported on prior to this cycle? (semester and year) | C. What method was used for assessing the SLO? <b>Please include a copy of any rubrics used in the assessment process.</b>  | D. Who was assessed? Please fully describe the student group(s) and the number of students or artifacts involved (N).  | E. What is the expected proficiency level and how many or what proportion of students should be at that level?  | F. What were the results of the assessment? (Include the proportion of students meeting proficiency.)  | G. What were the department's conclusions about student performance? | H. What changes/improvements to the <u>program</u> are planned based on this assessment?  |
|---|---|---|--|---|--|--|---|
| SLO 1: Students will develop a broad-based knowledge of concepts and terminology in organismal, and ecological biology.               | Spring 2023   | To assess knowledge of organismal and ecological biology we will administer the GRE to each class of First Year Seminar (BIOL 171) for baseline assessment and administer the GRE and MFAT exam to each class of Senior Seminar (BIOL 493). For each of these exams, only the organismal and ecological portions should be considered. The MFAT in particular | We evaluated 7 WANR students in Fall 2023 and 5 in Spring 2024 enrolled in BIOL 171, and 3 WANR students in Fall 2023 and 3 in Spring 2024 enrolled in BIOL 493 with the | Our goal is to have 75% of our senior students score at or above 50% of National percentile on the on both the Organisma l portion and Pop. Biology Evolution and | 2 of 3 (66%) of students scored over 50 <sup>th</sup> percentile in Fall 2023 on the GRE in Organismal and Pop. Biology Evolution and Ecology. The other student scored in the 45 <sup>th</sup> percentile. 4 WANR students scored in the 34 <sup>th</sup> percentile, and 2 in the 27 <sup>th</sup> percentile, on the MFAT; which include Cellular and Molecular Biology components. | We did not meet our programmatic goals.                              | We recommend removing the Cellular and Molecular Biology portions of the GRE and MFAT from the WANR student tests, since they do not cover these topics extensively in their curricula. |

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|  |                       | is divided into Cell Biology, Molecular and Genetics, Organismal, & Pop. Biology Evolution and Ecology. The first two are not considered as they are not extensively covered in the WANR curriculum.   | GRE and MFAT Organismal & Ecology questions.  | Ecology portion of the GRE and MFAT exams.   |   |                                    |  |
| SLO 2: Students will know the taxonomy, ecology and natural history of flora and fauna in southern Colorado and the desert southwest | Spring 2023           | The raw score on taxonomy exams in taxonomy classes were used to assess student knowledge of local species.  | We evaluated 100% (17 of 17) of students in BIOL 483 (Mammalogy) in Spring 2024.  | Our goal is for 75% of students to score 70% or better on these exams.   | 100% of students (17/17) scored over 70% on the taxonomy exams in BIOL 483 (Mammalogy).   | We are meeting programmatic goals. | No changes to the program are recommended for this SLO at this time. |
| SLO 5: Students will demonstrate critical thinking and problem solving skills using experimental design and the scientific process.  | Has not been assessed | Critical thinking and problem-solving skills will be assessed in College Biology 1 Lab (BIOL 181L) and in BIOL 493 using a rubric (Appendix 1). In BIOL 181L the second full scientific paper will be evaluated by the instructor. In BIOL 493, the capstone research grant proposal will be evaluated by the faculty. | We evaluated 6 WANR students enrolled in BIOL 493 on their research grant proposals using the attached rubric (Appendix 1). | Our goal is to have 75% of our students in BIOL 493 receive an average score of proficient from the faculty on the attached rubric | 100% of BIOL 493 students (6 of 6) in WANR were scored as 'proficient' or above from faculty on their research grant proposals. | We are meeting programmatic goals. | No changes to the program for this SLO at this time.                 |

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|  |  |  |  | (Appendix 1). |  |  |  |
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**Comments on part I reporting:** WANR students are having trouble passing SLO 1, due to their not taking many classes that cover Cellular and Molecular Biology components in great depth. These are not skills commonly needed in jobs that are pursued by these students, such as wildlife management agencies and other conservation and environmental organizations (e.g., zoos, aquaria, environmental consulting firms). In lieu of these Cellular and Molecular courses, they take more courses in natural resource and endangered species management, natural resource laws & regulations, and conservation and organismal biology and ecology, among others. Therefore we recommend WANR students not be tested in the Cellular and Molecular Biology portions of the GREs and MFAT.

**II. Closing the Loop. Describe at least one data-informed change to your curriculum during the 2023-2024 cycle.** These are those that were based on, or implemented to address, the results of assessment from previous cycles.


| A. What SLO(s) or other issues did you address in this cycle?<br><b>Please include the outcome(s) verbatim from the assessment plan.</b> | B. When was this SLO last assessed to generate the data which informed the change?<br>Please indicate the semester and year. | C. What were the recommendations for change from the previous assessment column H and/or feedback? | D. How were the recommendations for change acted upon?   | E. What were the results of the changes? If the changes were not effective, what are the next steps or the new recommendations?   |
|--|--|--|--|---|
| SLO 5  | Has not been assessed  | Score BIOL 493 studentents from WANR on their research grant proposal capstones using a rubric.    | All Biology faculty were invited to attend the research grant proposal capstone presentations, and given rubrics to score WANR students. | These changes were effective. Now we have data on which senior seminar students (BIOL 493) from WANR are proficient in their presentations. We will continue to use these rubrics (Appendix 1) going forward. |
|  |  |  |  |   |

**Comments on part II follow through:** WANR students will be assessed on their senior seminar (BIOL 493) research grant proposal capstones using an established rubric (Appendix 1) in the future. This was found to be a useful tool in evaluating their proficiency in this area.

**Appendix 1**

***SLOs 4&5: Students will demonstrate critical thinking and problem-solving skills using experimental design and the scientific method BS in Biology Program assessment rubric***

|   | <b>Excellent</b>  | <b>Proficient</b>   | <b>Developmental</b>  | <b>Ineffective</b>  |
|---|---|---|---|---|
| <b>Review of Literature</b>                   | Extensive review of the literature; Clear connection between literature and the research question and/or hypothesis   | Review of Literature; demonstrates basic understanding of how previous literature interacts with proposal   | Review of literature incomplete; lacks complete understanding of how previous literature interacts with proposal  | Review of Literature lacking, poor understanding of how previous literature interacts with proposal   |
| <b>Research Questions and/or Hypothesis</b>   | Hypothesis clearly stated; clearly communicates variables and controls  | Hypothesis stated; communicates variables and controls  | Hypothesis poorly stated; partial or incomplete explanation of variables and controls   | Hypothesis not stated; no discussion of variables and controls  |
| <b>Proposed Experimental Aims</b>             | Aims test the hypothesis  | Aims mostly test the hypothesis   | Aims partially test the hypothesis  | Aims do not adequately test the hypothesis  |
| <b>Proposed Materials and Methods</b>         | Methods appropriately test the aims; justified choice of variables and controls; adequate sample size; superb and clearly communicated experimental design; correct and valid statistical analysis                                | Methods test most of the aims; questionable choice of variables and controls; sample size questionable; adequately communicated experimental design; statistical analysis meets minimum standards for validity            | Methods poorly test the aims; dubious choice of variables and controls; insufficient sample size; partial or incomplete communication of experimental design; questionable or incomplete statistical analysis           | Methods fail to test the aims; poor choice of variables and controls; sample size is deficient; poorly communicated experimental design; invalid or missing statistical analysis                      |
| <b>Interpretation of the Expected Results</b> | - Relates all expected results back to aims and hypothesis; communicates significance of proposed results; appropriate comparisons to literature; proposed experiment extends knowledge in field; additional hypotheses generated | Relates some results back to aims and hypothesis; significance of results implied but not clearly stated; partial comparisons to literature; proposed experiment extends knowledge in field additional hypotheses implied | Results poorly linked to aims and hypothesis; weak communication of significance of results; little comparison to literature; proposed experiment insufficiently adds knowledge in field; no future direction generated | Results not linked to aims and hypothesis; does not communicate significance of results; no comparison to literature; proposed experiment merely repeats previous work; no future direction generated |

|  BS in Biology | Excellent            | Proficient | Developmental | Ineffective |
|---|----------------------|------------|---------------|-------------|
|   | Review of Literature |            |               |             |
| Research Questions and/or Hypothesis  |                      |            |               |             |
| Proposed Experimental Aims  |                      |            |               |             |
| Proposed Materials and Methods  |                      |            |               |             |

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| Interpretation of the Expected Results |  |  |  |  |
|--|--|--|--|--|

Date \_\_\_\_\_

Academic year \_\_\_\_\_

Semester \_\_\_\_\_

**Degree Program Action Plan Update (from last Program Review)**

Program/ Department/Person completing:

Date of last program review:

Date of next program-specific accreditation review (if applicable):

Date of this update:

Dean's approval:

- Briefly summarize annual updates to the program status including major accomplishments and challenges.
- Be sure to include any program accreditation updates, where appropriate.

|   | Program Impact | Proposed actions (if applicable) |
|---|----------------|----------------------------------|
| Accomplishments Description                 |                |                                  |
| Challenges Description                      |                |                                  |
| Program Accreditation updates or challenges |                |                                  |

Indicate progress within the last year(s) on items from the current program action plan.

| Specific Item from Action Plan | Progress made on Action Plan item (indicate when completed) | Recommendations and projected timeline for further action | Resources Needs update (current, reallocation, new) | Person Responsible for further action |
|--------------------------------|---|---|---|---------------------------------------|
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