

## Department of Ecology Assessment Report for the Undergraduate Degree in Biology

### With Options Including:

Biology Teaching  
Conservation Biology & Ecology  
Fish & Wildlife Ecology & Management  
Organismal Biology

October 2022

### 1. Assessment Plan, Schedule and Data Source.

During the Fall Semester of 2021, the Ecology Department began implementing a new assessment plan. Prior to fall 2021, the Department assessed student learning among its biology majors by asking instructors of selected courses to provide examples of student responses to questions that assessed the learning outcomes for each degree option. The new assessment plan will collect data from incoming and graduating students in two 0-credit assessment courses that are now required for all students. This new plan gives the department the freedom to ask whatever questions it desires and will provide data regarding what students know as they graduate. Implementing this plan required changing the graduation requirements of biology majors. These changes only apply to students who began after the new requirements were in place.

Starting last fall, the department assessed the scientific reasoning skill of incoming students with 24 multiple-choice questions (Appendix 1). The department continued this work this fall, and 113 out of 123 of incoming students (92%) in the four biology options listed above completed the department's scientific reasoning test. The next stage of the department's assessment plan will be to assess all of the learning outcomes for its biology majors as they graduate. The first cohort of students to be assessed this way are expected to graduate Spring 2025.

The assessment committee is using the time between now and Spring 2025 to collect baseline data for its students and to identify challenges to students as they work towards their biology degree. The Department has met with MSU's Office of Planning and Analysis and has obtained anonymized data from biology majors for all of their coursework at MSU during the past six years. These data will be used to calculate basic metrics of student success for demographic groups among our majors such as retention and graduation rates so that these numbers can be evaluated annually to look for trends. The data will also be used to look for warning signs that correlated with failure to graduate. Such warning signs might be poor grades in introductory biology courses or poor grades in mathematics courses. These data will also be useful for examining how the sequence or timing of courses is correlated with performance in later courses. The assessment committee will present a preliminary analysis of these data to the department Spring 2023 and will ask for feedback.

### 2. What Was Done

Scientific reasoning data were collected from 113 (92%) of incoming students Fall 2022 using a Qualtrics survey (see the Appendix of this report for a summary of responses). The primary purpose of this data

collection is to assess how much the scientific reasoning skills of these students improves as they study biology. That analysis will be completed as students graduate.

In early September, the Department of Ecology's assessment committee obtained anonymous grades from all students majoring in its biology options for the past six years.

### **3. What Was Learned**

The Department of Ecology is just beginning its new assessment program and does not have substantial findings to report.

### **4. How we responded**

Conversations with faculty in the Ecology Department have been useful for designing the assessment program described here. For example, the strategy of performing assessment outside of specific courses was selected after faculty objecting to using class time or class materials for assessment. Also, the analysis of (anonymous) student transcripts to identify courses to collect baseline data was motivated by input from faculty.

### **5. Closing the Loop**

The goal of this assessment program is to create an iterative cycle of assessment and curricula revision whereby data collected by the assessment team leads to changes in instruction that are later evaluated for additional suggested modification based upon what is learned in the analysis. The assessment team is making progress towards this goal. To get there, the team will need more data to present to the faculty. This will begin in Spring 2023 when the preliminary analysis of student transcripts is presented to the department.