

ASSESSMENT REPORT 2017 - 2018

Forestry
(Instructional Degree Program)

B.S.
(Degree Level)

Program Mission:

Forestry is the application of scientific principles to the management of forest resources, including non-wood products. The mission of the Forestry Program at NMHU is to provide students the skills needed to excel in a natural resources management field of study by:

- Providing a broad-based undergraduate education in the Liberal Arts and Sciences;
- Promoting study and quality research in forestry and natural resource management and conservation sciences;
- Providing an understanding of the ethical and professional sustainable management of land systems;
- Providing a superior learning experience for students through dedicated teaching, hands-on learning, research, and commitment to the individual student; and
- Providing a combination of state of the art computer and science facilities and close access to a diversity of ecosystems for student experiential learning.

Student Learning Outcome 1:

Effectively describe and implement the process of scientific inquiry.

NMHU Traits Specifically Linked to Student Learning Outcome 1:

- Mastery of Content Knowledge and Skills
- Critical and Reflective Thinking Skills
- Effective Communication Skills

First Means of Assessment for Outcome 1 (SLO1a):

Design an experiment to examine an ecological question in FOR 231 (Terrestrial Ecology) and present this proposal to the class. Students must receive a grade of 70% or higher to be considered passing in this outcome.

Summary of Data:

Number of Students Meeting Criterion:	17	Number of Students Not Meeting Criterion:	3
Total Number of Students Assessed:	20	Percentage of Students Meeting Criterion:	85%

Second Means of Assessment for Outcome 1 (SLO1b):

Successfully design and describe the application of experimental design to a natural resource management problem. This design will be developed and presented in FOR 492 (Applied Forestry Research). Students must receive a grade of 70% or higher to be considered passing in this outcome.

Summary of Data:

Number of Students Meeting Criterion:	3	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	3	Percentage of Students Meeting Criterion:	100%

Third Means of Assessment for Outcome 1 (SLO1c):

Final grade of B or better in FOR 310 (Biometrics and Mensuration)

Summary of Data:

Number of Students Meeting Criterion:	6	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	6	Percentage of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 1:

The percentage of students meeting the criteria for SLO1a and SLO1c increased since the 2016-2017 Forestry outcomes assessment. Although there is still room for improvement in these metrics, these increases suggest that improvements in content delivery and focus in FOR 231 and FOR 310 have translated into improvements in students' abilities to understand, describe, and implement the scientific process. The overall high percentages of students meeting the criteria for Student Learning Outcome 1 suggest a relatively high level of competency among Forestry students with regard to the scientific method, which is critical for the effective management of forests and natural resources. Continued effort is necessary to further improve student abilities in this area, but the improvements observed since last year are encouraging. Overall, students met expectations for Student Learning Outcome 1.

Student Learning Outcome 2:

Effectively communicate scientific and resource management ideas, information, and results, as well as standards of professional ethics, both verbally and in writing, in a way that (1) demonstrates consistent logic; (2) is well organized; (3) states and defends a thesis; and (4) demonstrates competent use of language.

NMHU Traits Specifically Linked to Student Learning Outcome 2:

- Mastery of Content Knowledge and Skills
- Critical and Reflective Thinking Skills
- Effective Communication Skills

First Means of Assessment for Outcome 2 (SLO2a):

Present the results of the capstone project to the FOR 492 Senior Research Project class. A passing grade for this measure is >70%.

Summary of Data:

Number of Students Meeting Criterion:	3	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	3	Percentage of Students Meeting Criterion:	100%

Second Means of Assessment for Outcome 2 (SLO2b):

Grade on final exam in Natural Resource Economics (FOR 305) which requires a comprehensive analysis and presentation of a complicated natural resource valuation and decision problem involving forestry resources. A passing grade for this measure is >70%.

Summary of Data:

Number of Students Meeting Criterion:	9	Number of Students Not Meeting Criterion:	5
Total Number of Students Assessed:	14	Percentage of Students Meeting Criterion:	64%

Third Means of Assessment for Outcome 2 (SLO2c):

Final grade of B or better in Professional Ethics (FOR 426).

Summary of Data:

Number of Students Meeting Criterion:	11	Number of Students Not Meeting Criterion:	1
Total Number of Students Assessed:	12	Percentage of Students Meeting Criterion:	92%

Interpretation of Results for Outcome 2:

The percentages of students meeting the criteria for SLO2b and SLO2c are both slightly lower than last year. In both cases, the decreases are not terribly pronounced, but the results for SLO2b over the past two years suggest substantial room for improvement. Forestry students consistently have difficulty with critical thinking, quantitative reasoning, and mathematical calculations, all of which coincide to make the FOR 305 final exam particularly challenging for them. The Forestry faculty have been discussing moving FOR 305 to occur later in the Forestry curriculum so as to allow students more time and opportunities to develop the required skills and abilities; as such the developing trend of low student achievement on SLO2b, although likely accurately reflective of student ability, likely reflects the need for re-sequencing of the Forestry curriculum rather than the need for changes to FOR 305. Overall, Forestry students perform reasonably well in meeting the overall expectations of Student Learning Outcome 2, although room for improvement remains.

Student Learning Outcome 3:

Effective use of technology by competently using appropriate tools from forestry and its various sub-disciplines.

NMHU Traits Specifically Linked to Student Learning Outcome 3:

- Critical and Reflective Thinking Skills
- Effective Use of Technology

First Means of Assessment for Outcome 3 (SLO3a):

Demonstrated competence in using basic measuring instruments in an introductory field-based course (FOR 200, Field Practices). Final grade in course of C or better.

Summary of Data:

Number of Students Meeting Criterion:	16	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	16	Percentage of Students Meeting Criterion:	100%

Second Means of Assessment for Outcome 3 (SLO3b):

Demonstrated competence in using forest measuring instruments in an intermediate field-based course (FOR 310, Mensuration and Biometrics). Grade in a hands-on practicum exercise of B or better and a final grade in the course of C or better.

Summary of Data:

Number of Students Meeting Criterion:	6	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	6	Percentage of Students Meeting Criterion:	100%

Interpretation of Results for Outcome 3:

Improvement was observed in the percentage of students meeting the criteria for both SLO3a and SLO3b since last year's assessment. Although the improvement in outcomes for SLO3a were slight, they were more substantial for SLO3b as a result of changes in content delivery and focus in FOR 310 that were instituted by Dr. Sloan based upon last year's outcomes assessment. The technical ability of Forestry students is consistently quite good, and it may be appropriate to expand or alter our assessment methods so as to make them more rigorous so as to present more of a challenge for both students and faculty. Overall, students are meeting the Forestry Program's expectations for Student Learning Outcome 3.

Student Learning Outcome 4:

Mastery of Forestry knowledge and skills.

NMHU Traits Specifically Linked to Student Learning Outcome 4:

- Mastery of Content Knowledge and Skills
- Critical and Reflective Thinking Skills
- Effective Communication Skills

First Means of Assessment for Outcome 4 (SLO4a):

Take a final comprehensive Forestry Exit Exam that includes questions from the four SAF core competency areas. A passing grade will be 70%. This exam will not impact student graduation but will be used for assessment purposes and will provide students the opportunity to provide feedback on the Forestry Program to Faculty. This Exit Exam will be accompanied by a debriefing with graduating students.

Summary of Data:

Number of Students Meeting Criterion:	2	Number of Students Not Meeting Criterion:	2
Total Number of Students Assessed:	4	Percentage of Students Meeting Criterion:	50%

Second Means of Assessment for Outcome 4 (SLO4b):

Final grade of B or better in Forest Management (FOR 410).

Summary of Data:

Number of Students Meeting Criterion:	1	Number of Students Not Meeting Criterion:	2
Total Number of Students Assessed:	3	Percentage of Students Meeting Criterion:	33%

Third Means of Assessment for Outcome 4 (SLO4c):

Final grade of B or better in Applied Forestry Research (FOR 492).

Summary of Data:

Number of Students Meeting Criterion:	3	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	3	Percentage of Students Meeting Criterion:	100%

Fourth Means of Assessment for Outcome 4 (SLO4d):

Final grade of B or better in Natural Resource Law and Policy (FOR 330) or Geologic Resources, Law, and Environmental Policy (GEOL 412).

Summary of Data:

Number of Students Meeting Criterion:	1	Number of Students Not Meeting Criterion:	0
Total Number of Students Assessed:	1	Percentage of Students Meeting Criterion:	100%

Fifth Means of Assessment for Outcome 4 (SLO4e):

Final grade of B or better in Dendrology (FOR 313).

Summary of Data:

Number of Students Meeting Criterion:	4	Number of Students Not Meeting Criterion:	2
Total Number of Students Assessed:	6	Percentage of Students Meeting Criterion:	67%

Interpretation of Results for Outcome 4:

The percentage of students meeting the criteria for SLO4a and SLO4b decreased substantially since the last outcomes assessment; however, rather than suggesting a significant decrease in student ability, this is likely a reflection of a new faculty member having taken over the grading which underlies these metrics resulting in far more rigorous expectations than for previous assessments. As such, these outcomes are not likely validly comparable with their counterparts from previous assessments. Nonetheless, despite this apparent explanation, it is evident that Forestry students have a great deal of room for improvement in their ability to apply knowledge and skills from throughout the Forestry curriculum to complex and comprehensive resource management problems. The results for SLO4c and SLO4d, on the contrary, indicate that students are sufficiently knowledgeable and capable with regard to their applied problem solving abilities and knowledge of natural resources law and policy. The results for SLO4e suggest room for improvement in students' knowledge of taxonomy and plant identification. This is consistently a difficulty of Forestry students, but the knowledge and skills acquired in FOR 313 are essential for Foresters and this shortcoming must be addressed. Overall, students are meeting the Forestry Program's expectations for Student Learning Outcome 4.

Utilization of Results:

These outcome results suggest the program is generally meeting its goals. The strong performance of all of the students in the final capstone course is evidence that the program is meeting its mission goals and providing a high quality forestry education that meets SAF standards. An ongoing challenge which is at the core of some deficiencies is weak applied math, communications, and critical thinking skills. These weaknesses are particularly evident in courses such as FOR 305 and FOR 410 (SLO2b and SLO4b, respectively). This was the second year Forestry implemented an exit exam and a student debriefing session as part of the capstone course. This was again a valuable tool for understanding what students perceived as the strongest and weakest aspects of the program. Hands-on field experiences were again at the top of their

lists, and we continue to work toward incorporating more of these into the overall curriculum. This has resulted in both logistical and budgetary challenges that must be addressed through improved planning and curriculum mapping. Another recurring discussion item with students was sequencing of courses in the curriculum. To address course sequencing issues, the Forestry program has moved FOR 310 to the fall semester, FOR 402 to the spring semester, and FOR 410 to the fall semester.

Changes to Program Based on Results:

Although all students are required to pass calculus or applied calculus in the Forestry program, many students struggle with basic math and quantitative skills and applying those skills to taking and interpreting measurements. Similarly, students consistently underperform in the areas of applied critical thinking and communications. Due to the importance of these skills to succeed in courses and professionally, the Forestry program has begun a curriculum mapping process to focus on developing and reinforcing these skills throughout the Forestry curriculum. Due to its scope, the completion and implementation of this curriculum mapping approach will likely require several years to accomplish. Additionally, to facilitate improved course sequencing, the Forestry program intends to revise the prerequisites for its courses during the upcoming year.

Retention Strategies:

The Forestry Program will revisit and revise course scheduling, curriculum changes (e.g., course numbering and offerings) and curriculum advising to create a more efficient and clear path for new and transfer students to complete the forestry curriculum in a timely manner. We will be proposing a second set of revisions this year that are aimed at creating a more coherent progression of knowledge and skills, provide clearer guidance on prerequisites, and encourage student cohorts in multiple classes. Additionally, more frequent communications and consultation between students and academic advisors is being encouraged.