

**Undergraduate Degree Program Assessment**  
**Department of Forest and Natural Resources Management**

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**Version 1**

## Table of Contents

Mission Statement – College .....	1
Mission, Vision and Goals Statements – Department .....	1
Overview of Undergraduate Degrees.....	2
Forest Ecosystem Science.....	3
Background .....	3
Learning Outcomes and Objectives .....	3
Assessing the Learning Outcomes and Objectives .....	6
Forest Resources Management .....	7
Background .....	7
Learning Outcomes and Objectives .....	7
Assessing the Learning Outcomes and Objectives .....	11
Natural Resources Management .....	12
Background .....	12
Learning Outcomes and Objectives .....	12
Assessing the Learning Outcomes and Objectives .....	16
Appendix A – Forest Ecosystem Science Assessment Tables.....	18
Appendix B – Forest Resources Management Assessment Tables .....	28
Appendix C – Natural Resources Management Assessment Tables .....	38
Forest Ecosystem Science Assessment Data Form.....	48
Forest Resources Management Assessment Data Form .....	49
Natural Resources Management Assessment Data Form .....	50

## **Mission Statement – College**

The mission of the College of Environmental Science and Forestry is to advance knowledge and skills and to promote the leadership necessary for the stewardship of both the natural and designed environments.

## **Mission, Vision and Goals Statements – Department**

The Department of Forest and Natural Resources Management's mission statement is:

*The mission of the ESF Forest and Natural Resources Management programs is to produce and to transmit knowledge about the function and dynamics of forests and related renewable resources to all of our customers; to encourage continual learning about forest and related renewable resources and their role in making people's lives better; and to develop leaders who will manage renewable resources for people on a sustainable basis.*

Our vision of professional resource managers is that they are problem solvers. They have mastered integration of disciplinary knowledge and have the necessary skills to protect and manage forest and natural resources. ESF-educated resource managers are leaders who help people solve the complex problems of the world's natural resources.

Goals—Our Forest and Natural Resources programs have four broad goals:

- ◆ Understand the function and dynamics of forests and related renewable resources
- ◆ Attain the skills to manipulate forests and related natural resource systems and to predict the consequences
- ◆ Monitor citizen and owner values regarding forests and natural resources and respect them
- ◆ Integrate values with scientific facts and know the limits of our knowledge

Professional forestry education at ESF—today's Forest Resources Management degree—began with the opening of the College in 1911. In 2002, a parallel program in Natural Resources Management was added to capture the current breadth of faculty and student interests in renewable resources and their management. Today's resources management programs are based on a clear vision that combines professional competency with a strong foundation in the biophysical sciences, humanities and social sciences.

## **Overview of Undergraduate Degrees**

FNRM offers three different undergraduate degrees:

1. **Forest Ecosystem Science** – The focus of this degree is to provide students an undergraduate education in the sustainable management of forest resources. This program has a higher expectation for students in science-based understanding of biological and ecological systems as compared to Forest Resources Management (NOTE that learning objectives are the same for Forest Ecosystem Science and Forest Resources Management students).
2. **Forest Resources Management** –The program is designed to provide students with a professional degree in forestry. It is accredited by the Society of American Foresters – the specialized accrediting body for forestry educational programs in the United States. The Society of American Forests grants accreditation to specific education curricula that lead to a first professional degree in forestry at the Bachelor’s and Master’s level. SAF accredited curricula are periodically reviewed to ensure they continue to adhere to SAF standards. SAF is recognized as a program accrediting organization by the Council for Higher Education Accreditation. ([www.safnet.org/education](http://www.safnet.org/education))
3. **Natural Resources Management** – The focus of this degree is to provide students an undergraduate education in the sustainable management of natural resources (specifically vegetation, soils, water, wildlife and recreation). It is a more general degree than Forest Resources Management.

## **Forest Ecosystem Science**

### Background

The Bachelor of Science degree program in Forest Ecosystem Science is based on a vision that combines professional competency in forest management skills with an enhanced understanding of ecological sciences. The degree program allows students to obtain the professional skills that employers look for in new employees and a deeper understanding of the scientific basis of those skills. These skills are developed through a combination of core courses focusing on biology, ecology, ecosystems, and management.

### Learning Outcomes and Objectives

- 1) Understand Forests
  - a) Explain and interpret the relationships among flora and fauna including the biological and physical requirements of different plant and animal species within a forested ecosystem.
- 2) Measure Forests
  - a) Plan, conduct, and analyze forest inventories including biological, physical, and social-economic elements using appropriate statistical sampling methods.
  - b) Identify the major species, both flora and fauna, in a given area correctly.
  - c) Project stand and forest development using computer based and non-computer based growth and yield models.
- 3) Manipulate Forests
  - a) Describe alternative ways to change or maintain forest structure.
  - b) Prescribe, justify, and implement treatments in accord with owner objectives.
- 4) Manage Forests
  - a) Evaluate tradeoffs among biological sustainability, economic feasibility, and social acceptability with respect to alternative forest management plans.
  - b) Describe and apply appropriate decision-making tools and techniques (e.g., investment analyses) to evaluate alternative forest management practices.
  - c) Specify and implement management practices appropriate to ownership objectives.
- 5) Analyze Policy
  - a) Explain policy making processes at national, state, and local levels, for both large and small organizations as these processes affect forest management.
- 6) Communicate
  - a) Explain forest development, manipulation, and management to a variety of audiences in both written and oral form.
  - b) Describe technical forestry terms to a variety of audiences using consistent and accurate terminology.
- 7) Demonstrate Ethical Behavior
  - a) Act in an honest and credible manner.
  - b) Take responsibility for the work of a team and individual actions.
  - c) Exhibit tolerance for different viewpoints and opinions.
  - d) Recognize values and value systems used to reach decisions and to take actions.
- 8) Solve Problems

- a) Define a problem.
  - b) Determine cause of the problem.
  - c) Identify, prioritize and select alternatives for a solution (e.g., strategic, tactical and operational planning).
  - d) Implement a solution.
  - e) Explain the conceptual framework of each problem-solving step.
  - f) Facilitate a team through a systematic process for problem-solving.
- 9) Lead
- a) Recognize and explain the union between leading and following.
  - b) Demonstrate effective teamwork skills.

Each one of the learning objectives are addressed by the core courses listed in Table 1. Table 2 shows the mapping of the degree requirements to the learning objectives for upper division (300- and 400-level course only, excluding electives), within-Department (FOR\_\_\_) courses.

Table 1. List of professional education core courses in the Forest Ecosystem Science degree program.

<b>PROFESSIONAL EDUCATION CORE</b>	<b>Credits</b>
Dendrology	3
Orientation Seminar: Forest and Natural Resources Mgt.	1
Adirondack Field Studies	4
Forest Mensuration	3
Forest Biometrics	3
Geospatial Information Technologies	3
Forest Ecology	3
Silviculture	4
Introductory Soils	3
Natural Resources Policy	3
Integrated Resource Management	3
Advanced Biology Electives	6
Ecosystems/Ecology Electives	9
Management Electives	7
Human Dimensions Elective	3
	<hr/>
	<b>58</b>
	<hr/>
Free Electives	12
	<hr/>
<b>Total Required for Graduation</b>	<b>128</b>

Table 2. Mapping of the Departmental, core 300- and 400-level courses in the Forest Ecosystem Science degree requirements to the learning outcomes.

Required Courses	Learning Outcomes								
	Understand Forests	Measure Forests	Manipulate Forests	Manage Forests	Analyze Policy	Communicate	Demonstrate Ethical Behavior	Solve Problems	Lead
APM391 Introduction to Probability and Statistics		X						X	
ESF300 Introduction to Geospatial Information Technologies		X				X		X	
FOR296 Adirondack Field Studies in FNRM	X	X				X	X	X	X
FOR322 Forest Mensuration		X	X			X		X	X
FOR323 Forest Biometrics		X	X			X		X	
FOR332 Forest Ecology	X	X				X		X	
FOR334 Silviculture	X	X	X	X		X	X	X	X
FOR345 Introduction to Soils	X	X				X		X	
FOR360 Principles of Management				X	X	X	X	X	
FOR465 Natural Resources Policy					X	X	X	X	X
FOR490 Integrated Resources Management	X	X	X	X	X	X	X	X	X

## Assessing the Learning Outcomes and Objectives

Table 2 provides an outline of the core, professional-level courses required for the degree and identifies which courses meet specific learning outcomes and associated objectives. Subsets of courses are used to assess each of the nine learning objectives (see Tables A1-A9 in Appendix A).

Assessment of the Forest Ecosystem Science degree program is both formative and summative. Formative assessment is based on individual faculty evaluating the body of students in their class for achievement of learning objectives using a formal survey instrument (Appendix D). Each principal faculty in a course completes the survey form with reference to a set of learning objectives. The Undergraduate Studies Coordinator collects the forms each semester. Once every 3 years an ad hoc committee of faculty is organized to assess the degree program and lead (possibly) the development of curriculum changes. The completed survey forms are provided to this ad hoc committee so that they can use the semester-by-semester learning objectives assessment information. Summative assessment is achieved via a capstone course: FOR 490. FOR 490 is a student team, project-oriented course which mixes one hour of lecture and six hours of lab time each week. At the beginning of the course, the principal faculty solicits feedback from students on what they know and remember from earlier classes in their degree program. Students complete a major project which is specific to their degree program. A written and oral report accompanies each project, and faculty evaluate the projects.

## **Forest Resources Management**

### Background

Professional forestry education has been featured at ESF since the College's founding in 1911. Today's Forest Resources Management program is based on a clear vision that combines professional competency with a strong foundation in the biophysical sciences, humanities, and social sciences to meet society's needs for forest managers.

Forest Resources Management is an integration of forest ecology and biology, forest measurements, forest policy and administration, and courses to predict and evaluate the effects of manipulation. Timber, water, recreation, wildlife, and a broad array of environmental values and services, such as biodiversity and healthy forest systems, are important results of effective management. This major prepares students to be well-rounded generalists who can practice forestry and succeed as professionals in a variety of allied natural resource management fields.

The educational program in Forest Resources Management leads student to a first professional degree in forestry. It is accredited by the Society of American Foresters (SAF). SAF is recognized by the Commission on Recognition of Postsecondary Accreditation as the specialized accrediting body for forestry in the United States. The Forest Resources Management program was first accredited by SAF in 1935, was last accredited in 2005, and will be assessed for accreditation in 2015.

### Learning Outcomes and Objectives

- 1) Understand Forests
  - a) Explain and interpret the relationships among flora and fauna including the biological and physical requirements of different plant and animal species within a forested ecosystem.
- 2) Measure Forests
  - a) Plan, conduct, and analyze forest inventories including biological, physical, and social-economic elements using appropriate statistical sampling methods.
  - b) Identify the major species, both flora and fauna, in a given area correctly.
  - c) Project stand and forest development using computer based and non-computer based growth and yield models.
- 3) Manipulate Forests
  - a) Describe alternative ways to change or maintain forest structure.
  - b) Prescribe, justify, and implement treatments in accord with owner objectives.
- 4) Manage Forests
  - a) Evaluate tradeoffs among biological sustainability, economic feasibility, and social acceptability with respect to alternative forest management plans.
  - b) Describe and apply appropriate decision-making tools and techniques (e.g., investment analyses) to evaluate alternative forest management practices.
  - c) Specify and implement management practices appropriate to ownership objectives.
- 5) Analyze Policy

- a) Explain policy making processes at national, state, and local levels, for both large and small organizations as these processes affect forest management.
- 6) Communicate
  - a) Explain forest development, manipulation, and management to a variety of audiences in both written and oral form.
  - b) Describe technical forestry terms to a variety of audiences using consistent and accurate terminology.
- 7) Demonstrate Ethical Behavior
  - a) Act in an honest and credible manner.
  - b) Take responsibility for the work of a team and individual actions.
  - c) Exhibit tolerance for different viewpoints and opinions.
  - d) Recognize values and value systems used to reach decisions and to take actions.
- 8) Solve Problems
  - a) Define a problem
  - b) Determining the cause of the problem
  - c) Identify, prioritize and select alternatives for a solution (e.g., strategic, tactical and operational planning)
  - d) Implement a solution.
  - e) Explain the conceptual framework of each problem-solving step.
  - f) Facilitate a team through a systematic process for problem-solving.
- 9) Lead
  - a) Recognize and explain the union between leading and following.
  - b) Demonstrate effective teamwork skills.

Each one of the learning objectives are addressed by the core courses listed in Table 3. Table 4 shows the mapping of the degree requirements to the learning objectives for upper division (300- and 400-level course only, excluding electives), within-Department (FOR\_\_\_) courses.

Table 3. List of professional education core courses in the Forest Resources Management degree program.

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<b>PROFESSIONAL EDUCATION CORE</b>	<b>CREDITS</b>
Adirondack Field Studies	4
Dendrology	3
Geospatial Information Technologies	3
Silviculture	4
Forest Ecology	3
Introductory Soils	3
Forest Resource Measurements	6
Timber Management	4
Managerial Economics	3
Forest Operations	4
Outdoor Recreation	3
Natural Resources Policy	3

Wildlife Management elective	3
Vegetation Management elective	3
Water Resources elective	3
Forest Health/Protection elective	3
Integrated Resource Management	3
Freshman Orientation: Forest and Natural Resources Mgt.	1
<b>Minimum core credit hours</b>	<b>59</b>
Free electives	12
<b>Total required for graduation</b>	<b>129</b>

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Table 4. Mapping of the Departmental, core 300- and 400-level courses in the Forest Resources Management degree requirements to the learning outcomes.

Required Courses	Learning Outcomes								
	Understand Forests	Measure Forests	Manipulate Forests	Manage Forests	Analyze Policy	Communicate	Demonstrate Ethical Behavior	Solve Problems	Lead
APM391 Introduction to Probability and Statistics		X						X	
ESF300 Introduction to Geospatial Information Technologies		X				X		X	
FOR296 Adirondack Field Studies in FNRM	X	X				X	X	X	X
FOR322 Forest Mensuration		X	X			X		X	X
FOR323 Forest Biometrics		X	X			X		X	
FOR332 Forest Ecology	X	X				X		X	
FOR333 Natural Resources Managerial Economics	X		X			X	X	X	X
FOR334 Silviculture	X	X	X	X		X	X	X	X
FOR345 Introduction to Soils	X	X				X		X	
FOR360 Principles of Management				X	X	X	X	X	
FOR370 Timber Management	X	X	X	X		X	X	X	X
FOR372 Fundamentals of Outdoor Recreation		X	X	X	X	X	X	X	X
FOR373 Forest Operations		X	X	X	X	X	X	X	X
FOR465 Natural Resources Policy					X	X	X	X	X
FOR490 Integrated Resources Management	X	X	X	X	X	X	X	X	X

## Assessing the Learning Outcomes and Objectives

Table 4 provides an outline of the core, professional-level courses required for the degree and identifies which courses meet specific learning outcomes and associated objectives. Subsets of courses are used to assess each of the nine learning objectives (see Tables B1-B9 in Appendix B).

Assessment of the Forest Resources Management degree program is both formative and summative. Formative assessment is based on individual faculty evaluating the body of students in their class for achievement of learning objectives using a formal survey instrument (Appendix D). Each principal faculty in a course completes the survey form with reference to a set of learning objectives. The Undergraduate Studies Coordinator collects the forms each semester. Once every 3 years an ad hoc committee of faculty is organized to assess the degree program and lead (possibly) the development of curriculum changes. The completed survey forms are provided to this ad hoc committee so that they can use the semester-by-semester learning objectives assessment information. Summative assessment is achieved via a capstone course: FOR 490. FOR 490 is a student team, project-oriented course which mixes one hour of lecture and six hours of lab time each week. At the beginning of the course, the principal faculty solicits feedback from students on what they know and remember from earlier classes in their degree program. Students complete a major project which is specific to their degree program. A written and oral report accompanies each project, and faculty evaluate the projects.

## **Natural Resources Management**

### Background

Natural resource management education has been featured at ESF since 2002. Today's Natural Resources Management program is based on a vision that combines professional competency in management skills with a strong foundation in the social and biophysical sciences. Natural Resources Management is an integration of natural resources ecology and biology, measurements, policy and administration, and courses to predict and evaluate the effects of manipulation. Vegetation, soils, water, recreation, wildlife, and a broad array of environmental values and services, such as biodiversity and healthy natural systems, are important results of effective management. This major prepares students to be well-rounded generalists who can practice natural resources management and succeed as professionals in a variety of allied fields.

### Learning Outcomes and Objectives

- 1) Understand Natural Environments
  - a) Explain and interpret the relationships among organic and inorganic resources, including the biological and physical requirements of different plant and animal species, within forest and watershed ecosystems, and how humans interact with these resources.
- 2) Measure Natural Resources
  - a) Identify the major species, both flora and fauna, in a given area correctly.
  - b) Assess the extent of human impacts on forests, watersheds, and other natural areas.
  - c) Plan, conduct, and analyze forest and watershed ecosystem and/or natural area inventories, including biological, physical, and social resources.
  - d) Describe and apply different statistical sampling methods to user groups, forests, watersheds and/or natural areas.
- 3) Manipulate Natural Resources
  - a) Describe alternative ways to manage forest and watershed ecosystems and natural areas for recreation, and/or watershed protection / restoration / enhancement purposes.
  - b) Prescribe, justify, and implement management strategies for forest and watershed ecosystems and natural areas in accord with owner objectives.
- 4) Manage Natural Resources
  - a) Evaluate tradeoffs among biological sustainability, economic feasibility, and social acceptability with respect to alternative natural resource management plans.
  - b) Describe and apply appropriate decision-making tools and techniques to human and / or natural resource management practices.
  - c) Specify and implement management practices appropriate to ownership objectives.
- 5) Analyze Policy
  - a) Explain policy making processes at national, state, and local levels, for both large and small organizations as these processes affect the management of stakeholder groups and natural resources.

- 6) Communicate
  - a) Explain forest, watershed, recreation, and/or natural area development, manipulation and management to different audiences in both written and oral form.
  - b) Describe related technical terms to many different audiences using consistent and accurate terminology.
- 7) Demonstrate Ethical Behavior
  - a) Act in an honest and credible manner.
  - b) Take responsibility for the work of a team and individual actions.
  - c) Exhibit tolerance for different viewpoints and opinions.
  - d) Recognize values and value systems used to reach decisions and to take actions.
- 8) Solve Problems
  - a) Define a problem
  - b) Determining the cause of the problem
  - c) Identify, prioritize and select alternatives for a solution (e.g., strategic, tactical and operational planning)
  - d) Implement a solution.
  - e) Explain the conceptual framework of each problem-solving step.
  - f) Facilitate a team through a systematic process for problem-solving.
- 9) Lead
  - a) Recognize and explain the union between leading and following.
  - b) Demonstrate effective teamwork skills.

Each one of the learning objectives are addressed by the core courses listed in Table 5. Table 6 shows the mapping of the degree requirements to the learning objectives for upper division (300- and 400-level course only, excluding electives), within-Department (FOR\_\_\_) courses.

Table 5. List of professional education core courses in the Natural Resources Management degree program.

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<b>PROFESSIONAL EDUCATION CORE</b>	<b>CREDITS</b>
Adirondack Field Studies	4
Introductory Soils	3
Watershed Hydrology	3
Forest Ecology and Silviculture	3
Accounting or Finance elective	3
Managerial Economics	3
Geospatial Information Technologies	3
Outdoor Recreation	3
Wildlife or Fisheries elective	3
Natural Resources Policy	3
Writing for Scientific Professionals	3
Human Dimensions elective	3
Natural Resources Agencies and Administration	3

Integrated Resource Management	3
Orientation: Forest and Natural Resources Mgt.	1
<b>Minimum core credit hours</b>	<b>44</b>
Free electives	21
<b>Total required for graduation</b>	<b>122</b>

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Table 6. Mapping of the Departmental, core 300- and 400-level courses in the Natural Resources Management degree requirements to the learning outcomes.

Required Courses	Learning Outcomes								
	Understand Natural Environments	Measure Natural Resources	Manipulate Natural Resources	Manage Natural Resources	Analyze Policy	Communicate	Demonstrate Ethical Behavior	Solve Problems	Lead
APM391 Introduction to Probability and Statistics		X						X	
ESF300 Introduction to Geospatial Information Technologies		X				X		X	
FOR296 Adirondack Field Studies in FNRM	X	X				X	X	X	X
FOR321 Forest Ecology and Silviculture		X	X			X		X	X
FOR340 Watershed Hydrology		X	X			X		X	
FOR333 Natural Resources Managerial Economics	X		X			X	X	X	X
FOR345 Introduction to Soils	X	X				X		X	
FOR360 Principles of Management				X	X	X	X	X	
FOR372 Fundamentals of Outdoor Recreation		X	X	X	X	X	X	X	X
FOR465 Natural Resources Policy					X	X	X	X	X
FOR488 Natural Resources Agencies and Administration					X	X	X	X	X
FOR490 Integrated Resources Management	X	X	X	X	X	X	X	X	X

## Assessing the Learning Outcomes and Objectives

Table 6 provides an outline of the core, professional-level courses required for the degree and identifies which courses meet specific learning outcomes and associated objectives. Subsets of courses are used to assess each of the nine learning objectives (see Tables C1-C9 in Appendix C).

Assessment of the Natural Resources Management degree program is both formative and summative. Formative assessment is based on individual faculty evaluating the body of students in their class for achievement of learning objectives using a formal survey instrument (Appendix D). Each principal faculty in a course completes the survey form with reference to a set of learning objectives. The Undergraduate Studies Coordinator collects the forms each semester. Once every 3 years an ad hoc committee of faculty is organized to assess the degree program and lead (possibly) the development of curriculum changes. The completed survey forms are provided to this ad hoc committee so that they can use the semester-by-semester learning objectives assessment information. Summative assessment is achieved via a capstone course: FOR 490. FOR 490 is a student team, project-oriented course which mixes one hour of lecture and six hours of lab time each week. At the beginning of the course, the principal faculty solicits feedback from students on what they know and remember from earlier classes in their degree program. Students complete a major project which is specific to their degree program. A written and oral report accompanies each project, and faculty evaluate the projects.

**APPENDIX A**

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## Appendix A – Forest Ecosystem Science Assessment Tables

Table A1. Forest Ecosystem Science Assessment Table – Learning Objective 1.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>1. UNDERSTAND FORESTS:                      - Explain and interpret the relationships among flora and fauna including the biological and physical requirements of different plant and animal species within a forested ecosystem.</p>	<p>FOR296                      FOR332                      FOR334                      FOR345                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 2 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Forest Ecosystem Science degree program will be formally assessed by a faculty ad hoc committee in 2009-2010, and every 3 years thereafter.</p>

Table A2. Forest Ecosystem Science Assessment Table – Learning Objective 2.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>2. MEASURE FORESTS:                      - Identify the major species, both flora and fauna, in a given area correctly.                      - Plan, conduct, and analyze forest inventories including biological, physical, social.                      - Describe and apply different statistical sampling methods used in measuring forests.                      - Project stand and forest development using computer-based and non-computer-based growth and yield projection models.</p>	<p>FOR296                      ESF300                      FOR322                      FOR323                      FOR332                      FOR334                      FOR345                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 2 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Forest Ecosystem Science degree program will be formally assessed by a faculty ad hoc committee in 2009-2010, and every 3 years thereafter.</p>

Table A3. Forest Ecosystem Science Assessment Table – Learning Objective 3.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>3. MANIPULATE FORESTS:                      - Describe alternative ways to change or maintain forest structure.                      - Prescribe, justify, and implement treatments in accord with owner objectives.</p>	<p>FOR322                      FOR323                      FOR334                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 2 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Forest Ecosystem Science degree program will be formally assessed by a faculty ad hoc committee in 2009-2010, and every 3 years thereafter.</p>

Table A4. Forest Ecosystem Science Assessment Table – Learning Objective 4.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>4. MANAGE FORESTS:                      - Evaluate tradeoffs among biological sustainability, economic feasibility, and social acceptability with respect to alternative forest management plans.                      - Describe and apply appropriate decision-making tools and techniques (e.g., investment analyses) to evaluate alternative forest management practices.                      - Specify and implement management practices appropriate to ownership objectives.</p>	<p>FOR334                      FOR360                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 2 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Forest Ecosystem Science degree program will be formally assessed by a faculty ad hoc committee in 2009-2010, and every 3 years thereafter.</p>

Table A5. Forest Ecosystem Science Assessment Table – Learning Objective 5.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>5. ANALYZE POLICY:                      - Explain policy making processes at national, state, and local levels, for both large and small organizations as these processes affect forest management.</p>	<p>FOR360                      FOR465                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 2 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Forest Ecosystem Science degree program will be formally assessed by a faculty ad hoc committee in 2009-2010, and every 3 years thereafter.</p>

Table A6. Forest Ecosystem Science Assessment Table – Learning Objective 6.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>6. COMMUNICATE:                      - Explain forest development, manipulation, and management to different audiences in both written and oral form.                      - Describe technical forestry terms to many different audiences using consistent and accurate terminology.</p>	<p>FOR296                      FOR322                      FOR323                      FOR332                      FOR334                      FOR345                      FOR360                      FOR465                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 2 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Forest Ecosystem Science degree program will be formally assessed by a faculty ad hoc committee in 2009-2010, and every 3 years thereafter.</p>

Table A7. Forest Ecosystem Science Assessment Table – Learning Objective 7.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>7. ETHICAL BEHAVIOR:                      - Act in an honest and credible manner.                      - Take responsibility for the work of a team and individual actions.                      - Exhibit tolerance for different viewpoints and opinions.                      - Recognize values and value systems used to reach decisions and to take actions.</p>	<p>FOR296                      FOR334                      FOR360                      FOR465                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 2 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Forest Ecosystem Science degree program will be formally assessed by a faculty ad hoc committee in 2009-2010, and every 3 years thereafter.</p>

Table A8. Forest Ecosystem Science Assessment Table – Learning Objective 8.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>8. SOLVE PROBLEMS:</p> <ul style="list-style-type: none"> <li>- Define a problem.</li> <li>- Determine the cause of a problem.</li> <li>- Identify, prioritize and select alternatives for a solution (e.g., strategic, tactical and operational planning).</li> <li>- Implement a solution.</li> <li>- Explain a conceptual framework of each problem solving step.</li> <li>- Facilitate a team through a systematic process for problem solving.</li> </ul>	<p>FOR296 FOR322 FOR323 FOR332 FOR334 FOR345 FOR360 FOR465 FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):</p> <ul style="list-style-type: none"> <li>- course-by-course evaluations made by principal instructors</li> <li>- most courses require students to complete projects that draw upon learning outcomes in previous courses</li> <li>- faculty evaluate the projects or other within course elements</li> </ul> <p>Summative Assessment Method (FOR490 only):</p> <ul style="list-style-type: none"> <li>- project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week</li> <li>- students complete a major project (group projects)</li> <li>- a written and oral report accompanies each project, and faculty evaluate the projects</li> </ul>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p>	<p>There have been approximately 2 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Forest Ecosystem Science degree program will be formally assessed by a faculty ad hoc committee in 2009-2010, and every 3 years thereafter.</p>

Table A9. Forest Ecosystem Science Assessment Table – Learning Objective 9.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>9. LEAD:                      - Recognize and explain the union between leading and following.                      - Demonstrate effective teamwork skills.</p>	<p>FOR296                      FOR322                      FOR334                      FOR465                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p>	<p>There have been approximately 2 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Forest Ecosystem Science degree program will be formally assessed by a faculty ad hoc committee in 2009-2010, and every 3 years thereafter.</p>

**APPENDIX B**

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## Appendix B – Forest Resources Management Assessment Tables

Table B1. Forest Resources Management Assessment Table – Learning Objective 1.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>1. UNDERSTAND FORESTS:                      - Explain and interpret the relationships among flora and fauna including the biological and physical requirements of different plant and animal species within a forested ecosystem.</p>	<p>FOR296                      FOR332                      FOR333                      FOR334                      FOR345                      FOR370                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p> <p>Ecological knowledge was generally less than expected/needed for upper division coursework (see assessment results from FOR334).</p>	<p>Require all students to take a new "Natural Resources Ecology" and a revised Forest Ecology course (FOR332) (new FRM curriculum developed 2008-2009).</p> <p>Require all students, including Ranger School transfers, to take FOR334 in fall semester of junior year (new FRM curriculum developed 2008-2009).</p> <p>Add a new technical elective on wood technology / science / products, per the 2005 SAF accreditation assessment (new FRM curriculum developed 2008-2009).</p> <p>The Forest Resources Management degree program is currently being formally assessed by a faculty ad hoc committee (2008-2009). It will be assessed again in 2011-2012, and every 3 years thereafter.</p>

Table B2. Forest Resources Management Assessment Table – Learning Objective 2.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>2. MEASURE FORESTS:                      - Identify the major species, both flora and fauna, in a given area correctly.                      - Plan, conduct, and analyze forest inventories including biological, physical, social.                      - Describe and apply different statistical sampling methods used in measuring forests.                      - Project stand and forest development using computer-based and non-computer-based growth and yield projection models.</p>	<p>FOR296                      ESF300                      FOR322                      FOR323                      FOR332                      FOR334                      FOR345                      FOR370                      FOR372                      FOR373                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Forest Resources Management degree program is currently being formally assessed by a faculty ad hoc committee (2008-2009). It will be assessed again in 2011-2012, and every 3 years thereafter.</p>

Table B3. Forest Resources Management Assessment Table – Learning Objective 3.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>3. MANIPULATE FORESTS:                      - Describe alternative ways to change or maintain forest structure.                      - Prescribe, justify, and implement treatments in accord with owner objectives.</p>	<p>FOR322                      FOR323                      FOR333                      FOR334                      FOR370                      FOR372                      FOR373                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p> <p>Silvicultural knowledge and skills were generally lacking in transfer students (see assessment results from FOR490).</p>	<p>Require all transfer students, including Ranger School transfers, to take FOR334 in fall semester of junior year (new FRM curriculum developed 2008-2009).</p> <p>The Forest Resources Management degree program is currently being formally assessed by a faculty ad hoc committee (2008-2009). It will be assessed again in 2011-2012, and every 3 years thereafter.</p>

Table B4. Forest Resources Management Assessment Table – Learning Objective 4.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>4. MANAGE FORESTS:                      - Evaluate tradeoffs among biological sustainability, economic feasibility, and social acceptability with respect to alternative forest management plans.                      - Describe and apply appropriate decision-making tools and techniques (e.g., investment analyses) to evaluate alternative forest management practices.                      - Specify and implement management practices appropriate to ownership objectives.</p>	<p>FOR334                      FOR360                      FOR370                      FOR372                      FOR373                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p> <p>Silvicultural knowledge and skills were generally lacking in transfer students (see assessment results from FOR490).</p>	<p>Require all transfer students, including Ranger School transfers, to take FOR334 in fall semester of junior year (new FRM curriculum developed 2008-2009).</p> <p>The Forest Resources Management degree program is currently being formally assessed by a faculty ad hoc committee (2008-2009). It will be assessed again in 2011-2012, and every 3 years thereafter.</p>

Table B5. Forest Resources Management Assessment Table – Learning Objective 5.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>5. ANALYZE POLICY:                      - Explain policy making processes at national, state, and local levels, for both large and small organizations as these processes affect forest management.</p>	<p>FOR360                      FOR372                      FOR373                      FOR465                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Forest Resources Management degree program is currently being formally assessed by a faculty ad hoc committee (2008-2009). It will be assessed again in 2011-2012, and every 3 years thereafter.</p>

Table B6. Forest Resources Management Assessment Table – Learning Objective 6.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>6. COMMUNICATE:                      - Explain forest development, manipulation, and management to different audiences in both written and oral form.                      - Describe technical forestry terms to many different audiences using consistent and accurate terminology.</p>	<p>FOR296                      FOR322                      FOR323                      FOR332                      FOR333                      FOR334                      FOR345                      FOR360                      FOR370                      FOR372                      FOR373                      FOR465                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Forest Resources Management degree program is currently being formally assessed by a faculty ad hoc committee (2008-2009). It will be assessed again in 2011-2012, and every 3 years thereafter.</p>

Table B7. Forest Resources Management Assessment Table – Learning Objective 7.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>7. ETHICAL BEHAVIOR:                      - Act in an honest and credible manner.                      - Take responsibility for the work of a team and individual actions.                      - Exhibit tolerance for different viewpoints and opinions.                      - Recognize values and value systems used to reach decisions and to take actions.</p>	<p>FOR296                      FOR333                      FOR334                      FOR360                      FOR370                      FOR372                      FOR373                      FOR465                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Forest Resources Management degree program is currently being formally assessed by a faculty ad hoc committee (2008-2009). It will be assessed again in 2011-2012, and every 3 years thereafter.</p>

Table B8. Forest Resources Management Assessment Table – Learning Objective 8.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>8. SOLVE PROBLEMS:</p> <ul style="list-style-type: none"> <li>- Define a problem.</li> <li>- Determine the cause of a problem.</li> <li>- Identify, prioritize and select alternatives for a solution (e.g., strategic, tactical and operational planning).</li> <li>- Implement a solution.</li> <li>- Explain a conceptual framework of each problem solving step.</li> <li>- Facilitate a team through a systematic process for problem solving.</li> </ul>	<p>FOR296 FOR322 FOR323 FOR332 FOR333 FOR334 FOR345 FOR360 FOR370 FOR372 FOR373 FOR465 FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):</p> <ul style="list-style-type: none"> <li>- course-by-course evaluations made by principal instructors</li> <li>- most courses require students to complete projects that draw upon learning outcomes in previous courses</li> <li>- faculty evaluate the projects or other within course elements</li> </ul> <p>Summative Assessment Method (FOR490 only):</p> <ul style="list-style-type: none"> <li>- project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week</li> <li>- students complete a major project (group projects)</li> <li>- a written and oral report accompanies each project, and faculty evaluate the projects</li> </ul>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Forest Resources Management degree program is currently being formally assessed by a faculty ad hoc committee (2008-2009). It will be assessed again in 2011-2012, and every 3 years thereafter.</p>

Table B9. Forest Resources Management Assessment Table – Learning Objective 9.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>9. LEAD:                      - Recognize and explain the union between leading and following.                      - Demonstrate effective teamwork skills.</p>	<p>FOR296                      FOR322                      FOR333                      FOR334                      FOR370                      FOR372                      FOR373                      FOR465                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Forest Resources Management degree program is currently being formally assessed by a faculty ad hoc committee (2008-2009). It will be assessed again in 2011-2012, and every 3 years thereafter.</p>

**APPENDIX C**

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## Appendix C – Natural Resources Management Assessment Tables

Table C1. Natural Resources Management Assessment Table – Learning Objective 1.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>1. UNDERSTAND NATURAL ENVIRONMENTS:                      - Explain and interpret the relationships among organic and inorganic resources, including the biological and physical requirements of different plant and animal species, within forest and watershed ecosystems, and how humans interact with these resources.</p>	<p>FOR296                      FOR321                      FOR333                      FOR340                      FOR345                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Natural Resources Management degree program was formally assessed by a faculty ad hoc committee in 2007-2008. It will be assessed again in 2010-2011, and every 3 years thereafter.</p>

Table C2. Natural Resources Management Assessment Table – Learning Objective 2.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>2. MEASURE NATURAL RESOURCES:</p> <ul style="list-style-type: none"> <li>- Identify the major species, both flora and fauna, in a given area correctly.</li> <li>- Assess the extent of human impacts on forests, watersheds, and other natural areas.</li> <li>- Plan, conduct, and analyze forest and watershed ecosystem and/or natural area inventories, including biological, physical, social resources.</li> <li>- Describe and apply different statistical sampling methods to user groups, forests, watersheds and/or natural areas.</li> </ul>	<p>FOR296 ESF300 FOR321 FOR345 FOR372 FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):</p> <ul style="list-style-type: none"> <li>- course-by-course evaluations made by principal instructors</li> <li>- most courses require students to complete projects that draw upon learning outcomes in previous courses</li> <li>- faculty evaluate the projects or other within course elements</li> </ul> <p>Summative Assessment Method (FOR490 only):</p> <ul style="list-style-type: none"> <li>- project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week</li> <li>- students complete a major project (group projects)</li> <li>- a written and oral report accompanies each project, and faculty evaluate the projects</li> </ul>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Natural Resources Management degree program was formally assessed by a faculty ad hoc committee in 2007-2008. It will be assessed again in 2010-2011, and every 3 years thereafter.</p>

Table C3. Natural Resources Management Assessment Table – Learning Objective 3.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>3. MANIPULATE NATURAL RESOURCES:                      - Describe alternative ways to manage forest and watershed ecosystems and natural areas for recreation, and/or watershed protection / restoration / enhancement purposes.                      - Prescribe, justify, and implement management strategies for forest and watershed ecosystems and natural areas in accord with owner objectives.</p>	<p>FOR321                      FOR333                      FOR372                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Natural Resources Management degree program was formally assessed by a faculty ad hoc committee in 2007-2008. It will be assessed again in 2010-2011, and every 3 years thereafter.</p>

Table C4. Natural Resources Management Assessment Table – Learning Objective 4.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>4. MANAGE NATURAL RESOURCES:</p> <ul style="list-style-type: none"> <li>- Evaluate tradeoffs among biological sustainability, economic feasibility, and social acceptability with respect to alternative natural resource management plans.</li> <li>- Describe and apply appropriate decision-making tools and techniques to human and / or natural resource management practices.</li> <li>- Specify and implement management practices appropriate to ownership objectives.</li> </ul>	<p>FOR321 FOR360 FOR372 FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):</p> <ul style="list-style-type: none"> <li>- course-by-course evaluations made by principal instructors</li> <li>- most courses require students to complete projects that draw upon learning outcomes in previous courses</li> <li>- faculty evaluate the projects or other within course elements</li> </ul> <p>Summative Assessment Method (FOR490 only):</p> <ul style="list-style-type: none"> <li>- project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week</li> <li>- students complete a major project (group projects)</li> <li>- a written and oral report accompanies each project, and faculty evaluate the projects</li> </ul>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Natural Resources Management degree program was formally assessed by a faculty ad hoc committee in 2007-2008. It will be assessed again in 2010-2011, and every 3 years thereafter.</p>

Table C5. Natural Resources Management Assessment Table – Learning Objective 5.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>5. ANALYZE POLICY:                      - Explain policy making processes at national, state, and local levels, for both large and small organizations as these processes affect the management of stakeholder groups and natural resources.</p>	<p>FOR360                      FOR372                      FOR465                      FOR488                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Natural Resources Management degree program was formally assessed by a faculty ad hoc committee in 2007-2008. It will be assessed again in 2010-2011, and every 3 years thereafter.</p>

Table C6. Natural Resources Management Assessment Table – Learning Objective 6.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>6. COMMUNICATE:                      - Explain forest, watershed, recreation, and/or natural area development, manipulation and management to different audiences in both written and oral form.                      - Describe related technical terms to many different audiences using consistent and accurate terminology.</p>	<p>FOR296                      FOR321                      FOR333                      FOR340                      FOR345                      FOR360                      FOR372                      FOR465                      FOR488                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Natural Resources Management degree program was formally assessed by a faculty ad hoc committee in 2007-2008. It will be assessed again in 2010-2011, and every 3 years thereafter.</p>

Table C7. Natural Resources Management Assessment Table – Learning Objective 7.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>7. ETHICAL BEHAVIOR:                      - Act in an honest and credible manner.                      - Take responsibility for the work of a team and individual actions.                      - Exhibit tolerance for different viewpoints and opinions.                      - Recognize values and value systems used to reach decisions and to take actions.</p>	<p>FOR296                      FOR321                      FOR333                      FOR360                      FOR372                      FOR465                      FOR488                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p> <p>Assessment forms will be reviewed and compiled by the Undergraduate Education Coordinator at the end of each semester and made available to a Departmental Committee (ad hoc) that will review the materials in preparation for assessing each program for revision.</p> <p>Each undergraduate degree program will be formally assessed for revision once every three years (NRM in 2007-2008, FRM 2008-2009, FES 2009-2010).</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Natural Resources Management degree program was formally assessed by a faculty ad hoc committee in 2007-2008. It will be assessed again in 2010-2011, and every 3 years thereafter.</p>

Table C8. Natural Resources Management Assessment Table – Learning Objective 8.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>8. SOLVE PROBLEMS:</p> <ul style="list-style-type: none"> <li>- Define a problem.</li> <li>- Determine the cause of a problem.</li> <li>- Identify, prioritize and select alternatives for a solution (e.g., strategic, tactical and operational planning).</li> <li>- Implement a solution.</li> <li>- Explain a conceptual framework of each problem solving step.</li> <li>- Facilitate a team through a systematic process for problem solving.</li> </ul>	<p>FOR296 FOR321 FOR333 FOR345 FOR360 FOR372 FOR465 FOR488 FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):</p> <ul style="list-style-type: none"> <li>- course-by-course evaluations made by principal instructors</li> <li>- most courses require students to complete projects that draw upon learning outcomes in previous courses</li> <li>- faculty evaluate the projects or other within course elements</li> </ul> <p>Summative Assessment Method (FOR490 only):</p> <ul style="list-style-type: none"> <li>- project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week</li> <li>- students complete a major project (group projects)</li> <li>- a written and oral report accompanies each project, and faculty evaluate the projects</li> </ul>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Natural Resources Management degree program was formally assessed by a faculty ad hoc committee in 2007-2008. It will be assessed again in 2010-2011, and every 3 years thereafter.</p>

Table C9. Natural Resources Management Assessment Table – Learning Objective 9.

LEARNING OBJECTIVE	WHERE ADDRESSED IN PROGRAM OF STUDY	HOW ASSESSED: GOALS AND METHODOLOGY	DATA COLLECTION PLAN	ASSESSMENT RESULTS	RESPONSE TO ASSESSMENT RESULTS
<p>9. LEAD:                      - Recognize and explain the union between leading and following.                      - Demonstrate effective teamwork skills.</p>	<p>FOR296                      FOR321                      FOR333                      FOR372                      FOR465                      FOR488                      FOR490</p>	<p>Formative Assessment Methods (all courses, except FOR490):                      - course-by-course evaluations made by principal instructors                      - most courses require students to complete projects that draw upon learning outcomes in previous courses                      - faculty evaluate the projects or other within course elements</p> <p>Summative Assessment Method (FOR490 only):                      - project oriented course which mixes, on average, one hour of lecture and six hours of lab time per week                      - students complete a major project (group projects)                      - a written and oral report accompanies each project, and faculty evaluate the projects</p>	<p>Assessment forms completed by the Principal Instructor at the end of each semester. Each course will be used for assessment once every 3 years, except FOR296 and FOR490 which will be used each year.</p>	<p>There have been approximately 15-20 students in program each year.</p> <p>Generally positive feedback (informal--new assessment tool [evaluation form] has been used since fall 2008) received from the faculty on the projects from their classes.</p>	<p>No anticipated changes in the curriculum based on the assessment of this learning objective.</p> <p>The Natural Resources Management degree program was formally assessed by a faculty ad hoc committee in 2007-2008. It will be assessed again in 2010-2011, and every 3 years thereafter.</p>

**APPENDIX D**

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## Forest Ecosystem Science Assessment Data Form

Date: \_\_\_\_\_

Instructor: \_\_\_\_\_ (Print)

Instructor: \_\_\_\_\_ (Signature)

Course Number and Name: \_\_\_\_\_

Assessed Project or other Course Element: \_\_\_\_\_

Respond to each of the following items by circling the number on the scale to the right as follows: -1 = Unsatisfactory (**U**), 0 = Satisfactory (**S**), 1 = Exceptional (**E**).

<b>Learning Objectives</b>	<b>U</b>	<b>S</b>	<b>E</b>
1. Understand Forests	-1	0	1
2. Measure Forests	-1	0	1
3. Manipulate Forests	-1	0	1
4. Manage Forests	-1	0	1
5. Analyze Policy	-1	0	1
6. Communicate	-1	0	1
7. Demonstrate Ethical Behavior	-1	0	1
8. Solve Problems	-1	0	1
9. Lead	-1	0	1

The benchmark for each of the Learning Outcomes is Satisfactory (**S**).

**Comments** (strengths, areas for improvement, suggestions for improvement, insights):

## Forest Resources Management Assessment Data Form

Date: \_\_\_\_\_

Instructor: \_\_\_\_\_ (Print)

Instructor: \_\_\_\_\_ (Signature)

Course Number and Name: \_\_\_\_\_

Assessed Project or other Course Element: \_\_\_\_\_

Respond to each of the following items by circling the number on the scale to the right as follows: -1 = Unsatisfactory (**U**), 0 = Satisfactory (**S**), 1 = Exceptional (**E**).

<b>Learning Objectives</b>	<b>U</b>	<b>S</b>	<b>E</b>
1. Understand Forests	-1	0	1
2. Measure Forests	-1	0	1
3. Manipulate Forests	-1	0	1
4. Manage Forests	-1	0	1
5. Analyze Policy	-1	0	1
6. Communicate	-1	0	1
7. Demonstrate Ethical Behavior	-1	0	1
8. Solve Problems	-1	0	1
9. Lead	-1	0	1

The benchmark for each of the Learning Outcomes is Satisfactory (**S**).

**Comments** (strengths, areas for improvement, suggestions for improvement, insights):

## Natural Resources Management Assessment Data Form

Date: \_\_\_\_\_

Instructor: \_\_\_\_\_ (Print)

Instructor: \_\_\_\_\_ (Signature)

Course Number and Name: \_\_\_\_\_

Assessed Project or other Course Element: \_\_\_\_\_

Respond to each of the following items by circling the number on the scale to the right as follows: -1 = Unsatisfactory (**U**), 0 = Satisfactory (**S**), 1 = Exceptional (**E**).

<b>Learning Objectives</b>	<b>U</b>	<b>S</b>	<b>E</b>
1. Understand Natural Environments	-1	0	1
2. Measure Natural Resources	-1	0	1
3. Manipulate Natural Resources	-1	0	1
4. Manage Natural Resources	-1	0	1
5. Analyze Policy	-1	0	1
6. Communicate	-1	0	1
7. Demonstrate Ethical Behavior	-1	0	1
8. Solve Problems	-1	0	1
9. Lead	-1	0	1

The benchmark for each of the Learning Outcomes is Satisfactory (**S**).

**Comments** (strengths, areas for improvement, suggestions for improvement, insights):