

**Final Report
to the
National Commission on
Science for Sustainable Forestry**

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NCSSF Research Project A.4 Add-On

**Nontimber Forest Products
Curriculum Development Project**

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Abstract

Nontimber forest products (NTFPs), such as wild foods, medicinal plants and floral greens, are often overlooked in natural resource management and policy, despite their widespread presence and use. However, increasing attention to ecosystem management, the conservation of biological diversity, sustainable forestry, and economic diversification in rural communities has meant a growing interest in nontimber forest products. Universities, extension programs and professional continuing education programs are now seeking to include information regarding the complex issues surrounding NTFP management in their curricula.

In response, the Institute for Culture and Ecology has developed a **NTFP Curriculum Workbook**. The workbook is a set of over 100 lesson plans, handouts, and homework assignments that provide college students, managers, scientists, and extension agents with an opportunity to learn about the ecological, cultural, political and economic importance of NTFPs. Due to the interdisciplinary nature of forest management, the workbook is relevant to students and professionals from a wide range of disciplines—including forestry, environmental studies, ecology, anthropology, economics, political science, and history. The geographic focus of the workbook is on the United States, although the exercises can easily be adapted to scale-up to the international arena or to scale-down to focus on species and issues of regional or local importance.

The workbook consists of seven modules – each including detailed lessons plans, activities, evaluation tools, and ready-to-use teaching aids, such as PowerPoint presentations and handouts. Each module has a specific disciplinary orientation (history, culture, economics, ecology, policy) to facilitate easy adoption within those different disciplines. The curriculum encourages critical thinking about NTFP issues and their relationship to overall forest health, sustainability and biodiversity conservation. This is accomplished through interactive classroom and field activities. Both theoretical frameworks and research methods are introduced and there is an emphasis on building effective communication and collaboration skills.

Faculty are encouraged to integrate individual lesson plans into their existing courses or use the workbook materials as the foundation for a new course or workshop. In addition, the Institute for Culture and Ecology is available to facilitate a set of workshops and courses based on the materials (See www.ifcae.org for more information).

This project was funded by the National Commission on Science for Sustainable Forestry. The NTFP Curriculum Workbook contributes directly to NCSF's mission of improving the scientific basis for U.S. sustainable forestry practices by providing critically needed educational materials designed to give natural resource managers the capacity to manage forest lands for greater biodiversity.

Introduction

In June 2002, the Institute for Culture and Ecology (IFCAE) received an 18-month grant from the National Commission on Science for Sustainable Forestry (NCSSF) to assess the relationships between forest management practices, nontimber forest products (NTFPs), and biodiversity in the U.S. The objectives of this research were to: 1) synthesize data regarding the impact of nontimber forest products management on forest ecosystem sustainability and biodiversity; and 2) directly support the ability of U.S. forest managers to assess nontimber forest product sustainability.

In this study we found that nontimber forest products (NTFPs), such as wild foods, medicinal plants and floral greens, are often overlooked in natural resource management and policy, despite their widespread presence and use. As one forest manager revealed, “I was trained to cruise timber, not ferns.” However, increasing attention to ecosystem management, the conservation of biological diversity, sustainable forestry, and economic diversification in rural communities has meant a growing interest in nontimber forest products. Universities, extension programs and professional continuing education programs are now seeking to include information regarding the complex issues surrounding NTFP management in their curricula.

To address this need, we recommended the development of new interdisciplinary curricula for forestry schools and management training programs to provide students, managers, scientists, and extension agents with knowledge regarding: a) the ecological, cultural and economic importance of NTFPs; and b) the role of NTFPs in ecosystem management. We proposed to create curriculum materials that university forestry professors, as well as educators in other disciplines and programs, could easily incorporate into their already existing courses or use as the foundation of new courses. In June 2004, the Institute for Culture and Ecology (IFCAE) received a 12-month grant from the National Commission on Science for Sustainable Forestry (NCSSF) to complete this curriculum development project.

Purpose

The goal of this project was to develop interdisciplinary curriculum materials that instructors can use to provide college students, land managers, scientists, and extension agents an opportunity to learn about the ecological, cultural and economic importance of nontimber forest products.

Approach

Phase One: Identification of Advisors and Collaborators

In Fall 2004 we began by developing an email invitation that was circulated to our faculty contacts at Universities throughout the United States. Our objectives were to: 1) identify existing NTFP courses in the U.S.; 2) gauge interest in integrating NTFP issues into existing courses; 3) gauge interest in teaching a new NTFP course; and 4) identify a core team of faculty interested in participating as either advisors or collaborators to our curriculum development project.

Once we identified our team of advisors and collaborators, we developed a simple needs assessment survey. In this survey we asked our team about the courses they teach and what types of materials would be most useful to them. The goal was to involve faculty from the beginning to ensure that the curriculum materials would be relevant, useful, and easy to use.

Phase Two: Curriculum Material Development

In Winter-Spring 2005 we developed the NTFP Curriculum Workbook. This entailed developing seven modules, each of which contains detailed lessons plans, evaluation tools, and ready-to-use teaching aids such as PowerPoint presentations, handouts and homework assignments that faculty can use in their classrooms. We used a modular approach to make it easy for professors across academic disciplines to introduce NTFPs into their existing courses. Modules can be used independently for a class or workshop session or combined to create a course. Throughout this phase our team of advisors reviewed the materials for completeness, accuracy, clarity, and usefulness.

Although field-testing the materials was above and beyond the scope of the Statement of Work, we felt it was an important element to ensure the successful adoption of these materials into relevant undergraduate classes. Given the limited time frame and budget of the project, we anticipated working with perhaps three to five faculty members who would provide feedback on the materials and test them in their classes. However, the initial response we received was overwhelming, with 34 faculty members from campuses around the country expressing interest in participating in the project. Participation included everything from responding to our needs assessment, reviewing some or all of the lesson plans, providing input on lesson plan design and readings, sharing existing lessons to be adapted for inclusion in this curriculum, to taking the lead on developing new materials. Field-testing of the materials has begun and will continue into the next year. The project also created some excitement among a broader range of stakeholders about the possibilities for developing stand-alone workshops for various audiences. We are currently seeking funding to enable us to respond to these requests and to ensure the dissemination and implementation of the workbook materials.

Summary of Results / Deliverables

Needs Assessment

Through the informal needs assessment process described above, we learned that our team of advisors and collaborators was interested in integrating NTFP materials into a diverse set of courses (e.g. General Ecology, Environmental Science, Environmental Anthropology, Conservation Issues, Development and Management of Protected Areas, Ecological Ethnobotany, Introduction to Forestry, Issues in Agriculture, etc.). These courses ranged in size from small seminars of 15 students to large lectures of 450, although most classes involved between 20 to 30 students. The responses also clearly articulated that the materials would need to be adaptable for all levels, from freshmen to graduate students.

In regards to content, our team of advisors was interested in materials that addressed cultural, economic and management issues, including agroforestry. Other items of interest included historical background regarding NTFPs, information on Native Americans gathering rights, and certification of NTFPs. In regards to classroom pedagogy, faculty requested interactive small group activities, homework assignment ideas, in-class discussion questions, and PowerPoint presentations. Other less requested items included video, fieldtrips, on-line references, and NTFP use in National Parks and other protected areas.

NTFP Curriculum Workbook

Overview

The NTFP Curriculum Workbook is a set of over 100 lesson plans, handouts, and homework assignments that provide college students, managers, scientists, and extension agents with an opportunity to learn about the ecological, cultural, political and economic importance of NTFPs. Due to the interdisciplinary

nature of forest management, the workbook is relevant to students and professionals from a wide range of disciplines- including forestry, environmental studies, ecology, anthropology, economics, political science, and history. The geographic focus of the workbook is on the United States, although the exercises can easily be adapted to scale-up to the international arena or to scale-down to focus on species and issues of regional or local importance.

The workbook consists of seven modules – each including detailed lessons plans, activities, evaluation tools, and ready-to-use teaching aids, such as PowerPoint presentations and handouts. Each module has a specific disciplinary orientation (history, culture, economics, ecology, policy) to facilitate easy adoption within those different disciplines. The curriculum encourages critical thinking about NTFP issues and their relationship to overall forest health, sustainability and biodiversity conservation. This is accomplished through interactive classroom and field activities. Both theoretical frameworks and research methods are introduced and there is an emphasis on building effective communication and collaboration skills.

Module Format and Overview

Each module contains an assortment of lesson plans, which can be incorporated individually into existing courses or used together as the foundation for a new course. Although the lessons are presented in a logical order, no imperative exists to use the lessons in the order presented. Therefore, we encourage faculty to approach this workbook like they would a salad bar – where they can pick and choose from the variety of lesson plans that best fit with their own course objectives and the needs and interests of their participants. To facilitate this ‘salad bar approach’, most lesson plans stand alone and do not require completion in any particular order. The few exceptions are noted in the lessons and generally involve fieldtrips that build on previous in-class preparation.

The first lesson plan in each module provides an overview of the key themes of the module, using a writing exercise, a PowerPoint presentation and small group discussions. It can be used: 1) at the beginning of the module to provide an introduction and overview of the content to be explored in the module; 2) at the end of the module or class as a way to summarize and reinforce key concepts that were presented; or 3) as a stand alone overview of the issues, if your existing syllabi allow for only one session on that particular NTFP theme. Background materials and discussion questions are included in the PowerPoint notes, which faculty can print and use as lecture guides.

The remaining lesson plans involve small group activities, group discussions, role plays, skits, debates and other interactive techniques to engage participants in critical thinking about the materials being presented. Each module also contains at least one lesson plan that introduces a social and natural science research method- including participant observation, interviewing, transects, and various participatory methods.

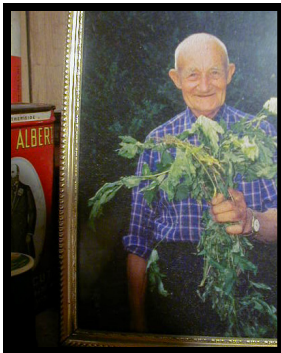
In conclusion, we have found that exploring the theme of nontimber forest products provides an opportunity to grapple with complex economics, multi-faceted politics, and diverse cultural traditions- including the ancient practices of Native American, the introduced plants and gathering traditions of immigrants, as well as the newly emerging traditions of people seeking to reconnect with the natural world. In essence, the topic demands holistic and interdisciplinary thinking—that is what makes studying NTFPs so rewarding. We hope you find the materials useful and we welcome your feedback.

Module 1: Introduction to the Diversity of NTFPs

This module contains eight lesson plans and eight homework assignments designed to introduce participants to the wide diversity of species considered to be nontimber forest products (NTFPs). The first lesson includes a PowerPoint presentation that provides a general overview and the second lesson introduces participants to two NTFP databases. The remaining lesson plans each explore a different NTFP sector – including wild foods, medicinal plants, floral greens, saps and other exudates, and plants used in arts and crafts.



Module 2: The History of Gathering



This module contains seven lesson plans and five homework assignments designed to give participants a historical perspective of gathering in the United States. Beginning with a ‘long look’ back, participants learn about the use of plants in prehistoric times and then how these uses have changed – and remained the same – over time. Participants then learn about effective interviewing skills and explore how their own family has interacted with wild plants in the past. The next two lessons look specifically at the relationships between Native American tribes and the U.S. government and provide a historical understanding of reserved gathering rights and management mechanisms such as the use of cultural use zones for protecting these rights. The module concludes with a look at the creation and evolution of the Forest

Service, in order to provide participants an understanding of the overarching context of forest management in the United States in which gathering practices have been embedded.

Module 3: Contemporary Harvesting Cultures

This module contains eight lesson plans, one homework assignment, five case studies, and one fieldtrip – all of which are designed to introduce participants to the cultural diversity of people involved in gathering activities. The overarching goal is for participants to develop an understanding of why it is important to consider cultural variables in forest planning and management. In the first set of lesson plans participants learn about harvesting directly from harvesters, who share their experiences and concerns about harvesting in different regions of the U.S. Complementing this, participants next gain an appreciation for contemporary Native American perspectives by reading several poems by well-known Native American poets. In regards to research methods, this module introduces two methods: 1) the seasonal calendar, which is a tool that can assist land managers and others to understand seasonal variation in NTFP harvesting activities, and 2) participant observation, which is the foundation of ethnographic research. Theory is included with an exploration of political ecology, which provides a useful framework for critically examining nontimber forest product management issues. The module concludes with lessons about traditional ecological knowledge. The accompanying fieldtrip provides an opportunity to build participant observation skills and deepen understanding of NTFP issues first-hand.



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Module 4: The Economics of Harvesting

This module contains eight lesson plans and four homework assignments designed to introduce the economics of nontimber forest product harvesting. Understanding the informal nature of NTFP markets and the organization of NTFP commodity chains can assist land managers and policy makers in making sound management and policy decisions. Developing an understanding of the market forces influencing NTFP harvesting patterns, as well as a sense of the values and quantities of NTFPs possible on the landscape, will give land managers and policy makers the information needed to promote resource sustainability and income opportunities for rural communities.

Module 5: Ecological Considerations

This module contains eleven lesson plans and five homework assignments that provide an introduction to ecological considerations relevant to nontimber forest products. This includes a focus on using inventory and monitoring data to determine sustainable harvest levels, determining best practices and certification systems for nontimber forest products. The remaining lesson plans focus on the current and potential role of nontimber forest products in agroforestry systems, restoration efforts, and fire adapted systems.



Module 6: The Politics of Harvesting



This module contains eight lesson plans and three homework assignments designed to introduce a range of federal laws and policies relevant to NTFP harvesting and commerce. This module focuses primarily on federal laws and policies because they frequently affect land management practices across many land ownerships, and because a body of readily accessible literature on federal NTFP laws and policies has emerged over the past decade. Homework assignment options encourage students to learn more about state-level NTFP policies. This module also provides a series of handouts – including a timeline of key policy and laws, information on Section 339 and Executive Order on Environmental Justice.

Module 7: Testing Your Understanding

This module contains four lesson plans that provide ideas for interactive ways to review the course materials. Also provided are course supporting materials, including ideas for group projects, evaluation forms and exam questions.

Lesson Plan Format

Each lesson plan contains the following components:

Time:	Overall time required to complete the lesson plan.
Overview:	Provides a quick overview of the activity.
Rationale:	Articulates why land managers need to understand the material presented.
Learning Objectives:	Identifies what knowledge and/or skills participants will gain in the activity. These objectives then serve as the evaluation criteria.
Required Reading:	Notes any reading that is required before beginning the activity. The main text used is <i>Nontimber Forest Products in the United States</i> by Jones, McLain and Weigand, eds. (2002). Other readings are included to complement and deepen the discussion of key themes.
Materials Needed:	Provides a list of materials needed to do the activity. All handouts that are mentioned are provided at the end of the lesson plan, unless otherwise noted.
Activity Description:	Provides step-by-step instructions for facilitating the activity. Time allotments for each step of the activity are included. These are estimates and can be adjusted according to the objectives of your course, the interests of your group, and the time you have available. Variations to the activity are sometimes provided which include alternate procedures that might appeal to different audiences, learning styles or situations. Anticipated answers to discussion questions are included, but because the questions are written to encourage critical thinking and application, most do not have a single response. Thus, the answers provided are meant to be useful guidelines, rather than a comprehensive list of 'right' answers. Facilitators are encouraged to bring their own experiences and understanding of the materials to the discussions.
Evaluation:	The section, entitled "Gauging Understanding," provides questions that can be used as the foundation for a group discussion, in-class writing assignment, homework, or as quiz or exam questions. The goal is to evaluate understanding of the key points from the activity and reading materials, and determine if the learning objectives were accomplished. Anticipated answers to the questions are included, but because the questions are written to encourage critical thinking and application, most do not have a single response. Thus, the answers provided are meant to be useful guidelines, rather than a comprehensive list of 'right' answers. Facilitators are encouraged to bring their own experiences and understanding of the materials to the discussions.
Additional Reading and Resources:	These materials and websites provide valuable background information and are recommended sources of information for participants working on group projects, research papers, or simply wishing to explore the topic more in-depth. They can also be assigned as additional reading before or after the activity to reinforce key concepts.
Handouts:	Handouts used in the classroom activities as well as Homework Handouts are included at the end of the lesson plan.

Excerpts from Peer Reviews

“I have read through the Module 2 materials and all I have to say is WOW – what a tremendous accomplishment – super collection of materials that I will certainly use in my courses!!! Thanks for this amazing body of work.”

“The modules are great! I plan to incorporate parts into all of my classes and maybe develop a new class for our Environmental Studies program. I’ve shared it around, and two others are considering using parts in their courses.”

“First off...Great job! I really enjoyed reading through these materials and I see them as being very useful. I think having these engaging and insightful lessons prepared for educators will help introduce many of these concepts to audiences that would have never been exposed to many of these ideas. I especially like the blending of social science theory, methodology, and ‘real-world’ grounded issues in the case studies.”

“Overall, I really like these materials and you have a well-developed set here. This will be very valuable. I will spread the word!”

“I have no particular suggestions, and commend you on the effort.”

“I just finished reading through Module 6 and am very impressed. I really have no critical comments. In a couple of places I noted something that should have been included or expanded. However, in each case that topic was covered later on. It is really good! ... The exercises are great and it is organized well.”

“Nice stuff. The whole class looks very comprehensive. Wish it was offered when I was going to school.”

“Well, after perusing the document and accompanying slide show off-and-on for the past weeks I really have nothing to say except WELL DONE! I wish I could be of more critical assistance but I really do think you folks have done a fine job with this and I look forward to the others.”

“Overall, this is once again very good and it is ready for classroom use immediately...More than the other modules I have read so far, this one really gets the students to see the wider connections of NTFPs by getting them into the forest, nurseries, and communities to really experience the wide array of products and species that are out there that most people are unaware of. Great job!”

“Thanks for sending the materials, which I have read with enthusiasm and admiration... The parts that speak most easily to me--and fill me with excitement--are the personal profiles of harvesters and the field trips and exercises. Merely getting students out of a classroom to speak to the people around them, eg harvesters, is very exciting as a teaching goal. I also love the seasonal calendar and bioregionalism exercises, which bring these concepts home to the students by getting them involved. Meanwhile, the three enclosed portraits of harvesters are excellent. You have picked skilled narrators, able to convey the sense of pleasure and knowledge of harvesting with vividness... you have done an excellent job of introducing these to a new audience and making your materials come to life.”

“I applaud you for trying to introduce theory, on the one hand, and ethnographic methods, on the other. Both of these are severely neglected in most practical training courses....Thank you for exposing me to this kind of teaching.”

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Appendix 2: Links to Project Website

A summary of the NTFP Curriculum Workbook, including an overview and table of contents for each module, is posted on the Institute for Culture and Ecology's website:

www.ifcae.org/projects/nessf2/

Appendix 3: List of publications

We are currently exploring options for publication and dissemination of the NTFP Curriculum Workbook. Potential publishers include: The University Press of Kansas (which published *Nontimber Forest Products in the United States*), Rowman & Littlefield, Island Press, and the National Science Teachers Association. Other options include self-publishing the materials at the Institute for Culture and Ecology and/or making the materials available on our website.

Appendix 4: Table of Contents for the NTFP Workbook

Introduction

Why Study Nontimber Forest Products?
Book overview- audience, goals, objectives, format
Tips for Great Facilitation

Module 1: The Diversity of Nontimber Forest Products

Introduction: Defining Nontimber Forest Products
 Homework Handout: Field Project—Meeting Plants
NTFP Species and Bibliographic Databases
 NTFP Species Database Worksheet
 NTFP Bibliographic Database Worksheet
 Homework Handout 1: NTFPs in the U.S.
 Homework Handout 2: Evaluating Websites Critically
 Homework Answer Keys
Wild Edibles Alphabet Soup
 Homework: Wild Foods Cookbook
 Alphabet Soup Answer Key
Foray into the World of Wild Mushrooms
 Homework Handout: Preparing for the Foray
 Handout: Additional Reading and Resources
Plants of Healing
 Homework: Wildcrafting Case Studies
Floral Greens
Saps, Oils, Resins and Gums
 Homework Handout: Tapping and Dipping
Plants Used in Arts and Crafts
 Homework Handout: NTFP Scavenger Hunt

Module 2: The History of Gathering

A Historical Look at Gathering
 Homework Handout: Writing about NTFPs
Prehistoric Ethnobotany
Linking Past and Present
Digging Into Our Own Roots
 Handout: Common Interviewing Errors
 Homework Handout: Digging Into Our Own Roots
Indian Reserved Rights
Making Peace in the Berry Patch: the 1932 Handshake Agreement

Homework Handout: Huckleberry Handshake Essay

A History of the Forest Service

Handout: Examining “The Greatest Good”

Homework Handout 1: NTFPs and National Parks

Answer Key: NTFPs and National Parks

Homework Handout 2: Writing About NTFPs

Module 3: Contemporary Harvesting Cultures

Introduction: Contemporary Harvesting Cultures

Homework: Building Critical Reading Skills

Diggers, Pickers, Foragers & More

Case Study 1: Harvesting in the Pacific Northwest

Case Study 2: A Native American Artist’s Perspective

Case Study 3: Wildcrafting Medicinals in the Ozarks and Florida

Case Study 4: Wildcrafting Medicinals in the High Rocky Mountains

Case Study 5: Wild Food Foraging in Maine

Contemporary Native American Perspectives

Picturing Theory: Political Ecology

Cultural Diversity & Forest Management

Traditional Ecological Knowledge I- Local Knowledge and Stewardship

Handout: Defining Traditional Ecological Knowledge

Handout: Comparing Indigenous and Modern Knowledge

Traditional Ecological Knowledge II – In the Field

Seasonal Calendars

Handout: Developing Seasonal Calendars

Module 4: The Economics of Harvesting

Introduction: The Economics of Harvesting

Informal Economies and Commodity Chains

Handouts: Five Examples of NTFP Commodity Chains

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Homework Handout 2: From Forests to Your Table

Livelihood Strategies and Quality of Life

Rural Economic Development

Homework Handout: Biodiversity Conservation and Poverty Position Paper

Domestic Markets

Homework Handout: Holiday Cheer – A Study of Holiday Floral Greens

International Markets

Valuing Nontimber Forest Products

What is a Living Wage?

Module 5: Ecological Considerations

Introduction: Ecological Considerations

Handout: Harvester Quotes to accompany the PowerPoint Presentation

Homework Handout: Field Observations

What is Sustainable?

Homework Handout: NTFPs on Threatened and Endangered Species List

Biological Inventory and Monitoring – Part I: Some Basics

Handout 1: Sampling Designs, Plot Configuration & Enumeration Methods

Handout 2: Plant Cover Estimation Worksheet

Biological Inventory and Monitoring – Part II: Participatory Approaches

Handout 1: Participation Continuum Worksheet

Homework Handout: I & M Advisory Council

Biological Inventory and Monitoring – Part III: In the Field

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Handout 2: Understory Plant Data

Medicinal Plant Wildcrafting Ethics

Reading Handout: Herbal Guidelines from an Ecological Herbalist

Handout: Some Harvester Perspectives

Certification of NTFPs

Handout: Debate Procedures and Policies

Homework Handout: NTFP Certification

Agroforestry Options with NTFPs

Handout: Agroforestry Review Questions

Homework Handout: Exploring Agroforestry Economics

NTFPs and Fire Ecology

Tragedy of the Commons Revisited

Measuring your Bioregional Knowledge

Handout: Bioregional Quiz

Module 6: The Politics of Harvesting

Introduction: the Politics of Harvesting

Homework: Scoping Out the Rules for NTFP Harvesters ...

Federal Laws & Policies Relevant to NTFPs

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Handout 2: Text of Section 339, PL 106-113

Handout 3: Federal Environmental Laws Relevant to NTFPs

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Handout: Land Management Agency NTFP Laws and Policies

Homework: NTFPs in Federal Land Management Planning

Exploring Environmental Justice

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Handout 2: Executive Order on Environmental Justice

Wildcrafters at the International Policy Table

Bio-prospecting Issues

Handout 1: Bioprospecting Case Study Questions

Handout 2: BLM Information Bulletin on the Pacific Yew Act

Customary Claims and Legal Pluralism –1

Handout: Customary Claims Questions

Customary Claims and Legal Pluralism –2

Handout 1: Managing Customary Claims

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Module 7: Testing Your Understanding

Where Do You Stand?

Handout: Where Do You Stand?

Illustrating Understanding

Sharing Your Understanding with the Community

Last Class ~ Wrap Up

Supporting Course Materials

Group Project: NTFP Case Study

Handout: Group Project

Handout: Group Project Worksheet – Getting Started

Midterm Evaluation- Group Project

Midterm Course Evaluation

Final Course Evaluation

Handout: Final Paper Checklist

Ideas for Exam Questions