


Natural Resources Education: Strategic Vision for the 21st Century

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Topical Outline

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- ◆ Shifting paradigm of natural resource management
 - ◆ Forces that are driving future change
 - ◆ Sustainability as the guiding paradigm
 - ◆ Creating future natural resource leaders

Shifting Natural Resource Management Philosophy

- ◆ 20th Century
- ◆ Agricultural Model
- ◆ Utilitarian emphasis
- ◆ Output oriented
- ◆ Stand level
- ◆ Sustained yield (timber primacy)
- ◆ Multiple use
- ◆ 21st Century
- ◆ Ecosystem Model
- ◆ Naturalistic emphasis
- ◆ State oriented
- ◆ Landscape view
- ◆ Sustainability (multi-resource)
- ◆ Integrated use

21st Century Decision Environment

- ◆ New complexities due to uncertainties
 - Bio-physical systems (environmental change)
 - Socio-economic systems (unpredictable political institutions and market situations)
- ◆ Global climate change
- ◆ Global market for ideas
- ◆ Information age (internet, mobility, etc.)

21st Century Decision Environment

- ◆ Reducing forest risk may replace productivity as principal concern of managers
- ◆ Increasing forest resiliency for sustainability will grow stronger
- ◆ Organizational networks and collaborative institutions may replace top-down hierarchical structures

Why a Paradigm Shift?

- ◆ Changing societal values of a growing and urbanizing population
- ◆ Growing awareness of the ecological and environmental implications of climate change
 - loss of biodiversity in managed forests, invasives, endangered species, wildfire, water, and forest health (insects and diseases)

21st Century Issues

- ◆ Societal desires for:
 - protection vs. production forests
 - natural vs. plantation forests
 - preservation vs. conservation
 - use vs. exchange value
 - passive vs. active management

21st Century Issues

- ◆ Additional issues –
 - ecosystem fragmentation
 - loss of habitat connectivity
 - forest land conversion
 - loss of ecosystem services
 - financial incentives which promote land development and conversion to HBU
 - Tremendous change in private forest land ownership patterns in USA

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Forces Driving Change

- ◆ Affluent and growing population with leisure time and disposable income
- ◆ Global climate change
- ◆ Impacts of a global economy
- ◆ Renewable energy requirements
- ◆ Forest health issues
- ◆ Enhancement of biodiversity

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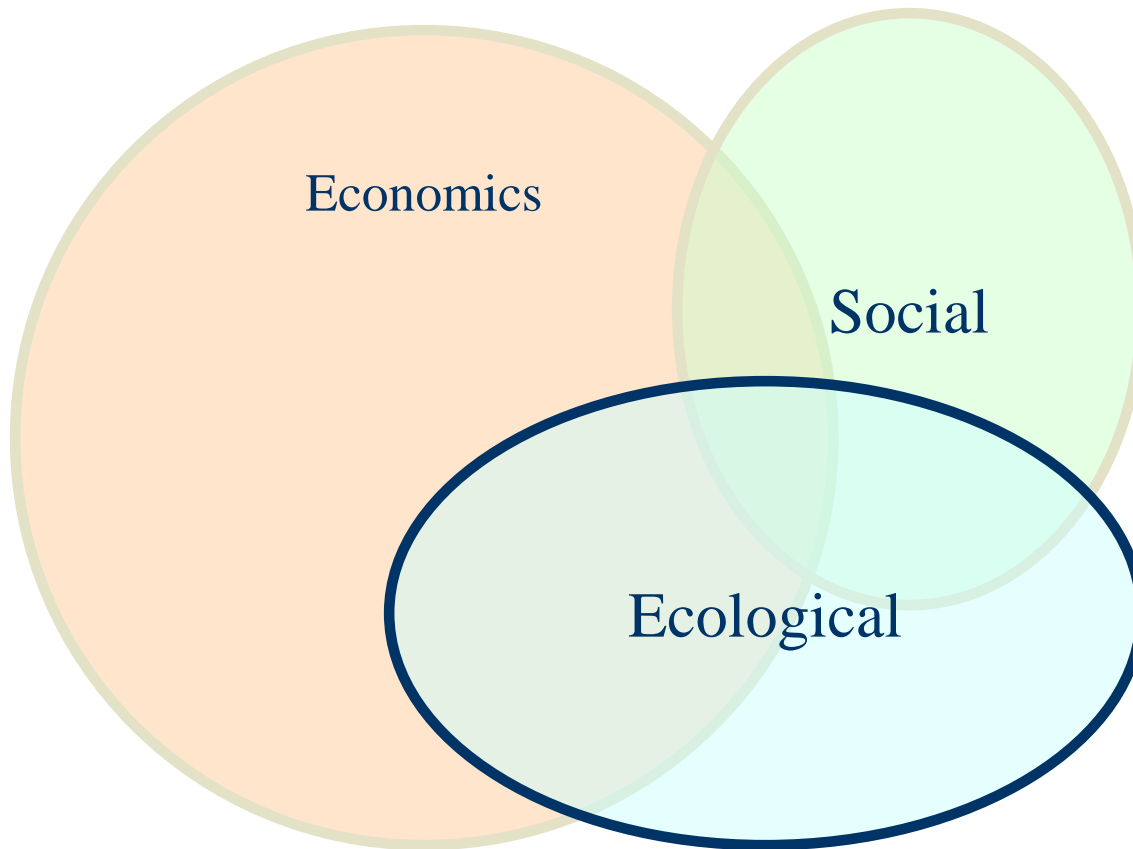
What Is Sustainability?

- ◆ A set of activities or processes that produce desired products and services over long periods of time
- ◆ Rational approach that seeks a dynamic equilibrium
- ◆ Uses interdisciplinary set of social, ecological and economic sciences in an integrated fashion
- ◆ Future generations have the opportunity to enjoy the same products and amenities as we do

Seeking Sustainability Is Complex

- ◆ Many stakeholders
- ◆ Multiple and conflicting goals (trade offs)
- ◆ Uncertainty
 - future societal needs
 - future state of ecosystem and unknown environmental factors
 - lack of complete understanding of ecosystem behavior and reaction to natural or man caused perturbations

Defining Sustainability



Seeking Sustainability

- ◆ The use of science is absolutely necessary to find the proper balance but is by no means sufficient
- ◆ Value preferences expressed through the economic, political, and legal systems will largely determine the ultimate balance
- ◆ Requires that we adopt an integrated, holistic, adaptive approach that simultaneously considers all values

Sustainable Forestry

- ◆ A type of management that views the forest not as the source of any one economic product or service, but as an integrated whole
- ◆ Respects the full range of environmental, social, and economic values of the forest and attempts to integrate these diverse values

Source: Roundtable on Sustainable Forests

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Mission Statement

The College of Forest Resources is dedicated to generating and disseminating knowledge for the stewardship of natural and managed environments and the sustainable use of their products and services through teaching, research, and professional and public outreach.

Vision Statement

The College of Forest Resources will be a world-class internationally recognized source of knowledge relevant to environmental and natural resource issues.

Strategic Themes

- ◆ Land and ecosystem management in an urbanizing world
 - *conflicts and tradeoffs among competing human and natural resource values in the growing and urbanizing global population*
- ◆ Sustainable forest enterprises
 - *land and water resource production, use, and management, with attention to the material and social impacts of sustainable practices*

Sustainability Is Our Integrating Goal

- ◆ Sustainable forestry in managed and natural forests
 - Plantations, parks, reserves, watersheds
- ◆ Sustainable urban environments
 - Urban forestry, horticulture, public gardens, restoration ecology, water, wildlife
- ◆ Sustainable forest enterprises
 - Paper mills, precision forestry technologies, recycling, wood products, non-timber products, bioproducts

College's Programmatic Niche

Study and investigate key principles and processes that explain the behavior and interaction of biotic and social systems along gradients from highly to minimally impacted terrestrial ecosystems — gives us a unique interdisciplinary base from which to play a leadership role in developing the science of sustainability – both on and off campus.

Our Academic and Research Programs

- ◆ Emphasize coupled human and bio-physical systems
- ◆ Support development of a new science of sustainability to integrate ecological and economic approaches in a socially acceptable manner
- ◆ Develop technology; discover new scientific knowledge; and transfer knowledge to the user community

Research Areas

- ◆ **Ecosystem Structure and Function**
 - Productivity, health, processes, management
- ◆ **Social and Human Systems**
 - Valuation, system integration, natural/human interactions
- ◆ **Technology**
 - Remote sensing, bio-energy, sustainable products, information technology, bio-technology

Program Offerings

- ◆ The College provides high quality – impact programs of study for students seeking: 1) professional education and/or 2) broad scientific understanding of forest ecosystems, environmental, and amenity services

Undergraduate Curricula

- ◆ Environmental Science and Resource Management
- ◆ Paper Science and Engineering
- ◆ Both majors lead to a Bachelor of Science in Forest Resources degree

Undergraduate Curriculum

- ◆ Starting in 1907, our College offered programs of study in forest management, logging engineering, and wood products
- ◆ In late 1960's and early 1970's we added outdoor recreation, wildlife science, and paper science and engineering and dropped wood products
- ◆ In the 1980's and 1990's we added urban horticulture, wildland conservation, and resource sustainability and dropped outdoor recreation

Undergraduate Curriculum

- ◆ Enrollment in our undergraduate programs started to decline in mid-1990's
- ◆ With seven undergraduate majors and a shrinking enrollment, our class size efficiency did not match that of the University as a whole
- ◆ Strategic planning indicated that consolidation of our majors was in order

Undergraduate Curriculum

- ◆ New integrated undergraduate curriculum in Environmental Science and Resource Management
 - focuses specialization at the graduate-level
 - fosters team approach to natural resource education through interdisciplinary courses
 - promotes sustainability
 - has potential to attract more students into the College

Undergraduate Curriculum

- ◆ New integrated undergraduate curriculum in Environmental Science and Resource Management:
 - retains and improves our historic strengths in forestry, conservation, horticulture, and wildlife
 - improves flexibility in the curriculum allowing students to tailor their studies via four options
 - is ‘transfer-student friendly’
 - improves integration, access and efficiency
 - provides opportunity to obtain both an MFR and BSF in five years

Graduate Program

- ◆ Offer professional masters programs in forest management, urban horticulture, urban forestry, etc., to provide in depth technical knowledge (accredited where appropriate) to satisfy employer needs
- ◆ MFR graduate programs linked to our four year BSF undergraduate programs provide efficiency and flexibility
- ◆ Consolidate learned degree (MS and PhD) programs to gain efficiency and integration

Summary

- ◆ Characteristics of a successful natural resources education in the future include:
 - Solid preparation in bio-physical and socio-economic sciences, communication, natural world, and critical reasoning
 - Understand and appreciate the role of interdisciplinarity, integration, collaboration, and cooperation
 - Work as member of a resource team
 - Understand how to work on issues at a variety of spatial scales



The End