Sustainable Forest Resource Management: Some Observations

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Topics for Today

- **Talk about sustainability and sustainable forestry**
- **Describe a case study which has some characteristics of sustainable forestry**
- **Briefly mention what our College is doing relative to sustainability**

What Is Sustainability?

- **To manage (passive and active), and use the products and amenities of managed forests, natural wild lands, and urban and suburban environments so that they are maintained in a productive state over the long term**

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

Definitions

- **Sustainable forests are the desired goal**
- **Sustainable forestry is the means to the desired end**

Sustainable Forestry

- **Managing a forest to meet all existing regulations such that environmental, social and economic factors are balanced to meet the needs of the present without compromising the ability of future generations to meet their needs**

Sustainable Forestry

- A land stewardship ethic that integrates reforestation, growing, and harvesting trees for useful products while conserving soil, air, and water quality, wildlife and fish habitat and aesthetics, and protecting: a) the resource from fire, pests, and diseases and b) lands of special significance

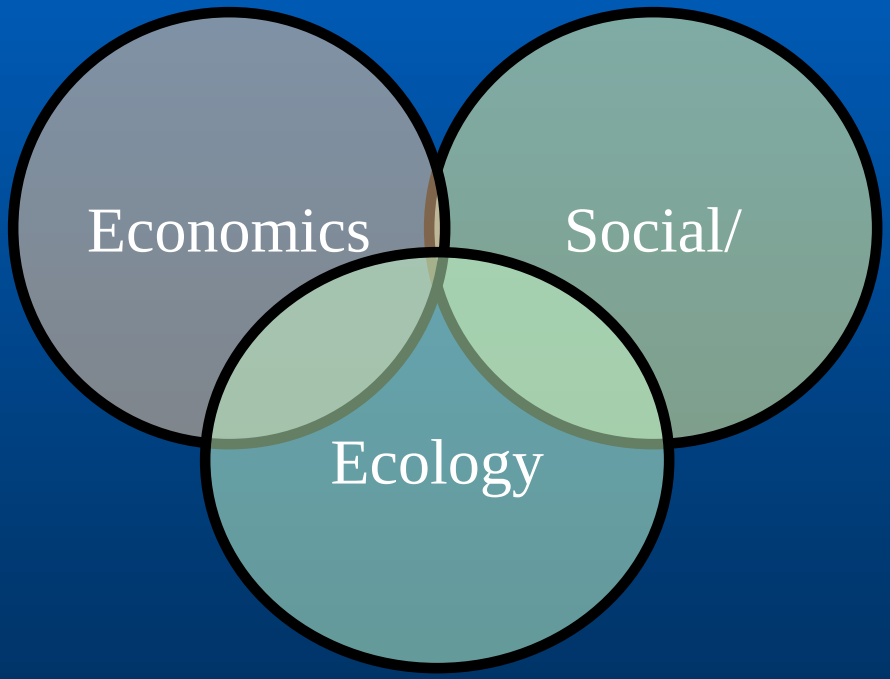
Sustainable Forestry

- Consider key values:
  - biodiversity
  - habitat protection and enhancement
  - riparian/wetland protection
  - maintenance of productive capacity
  - protection of endangered plants and animals
  - protection of cultural, spiritual, and historical sites

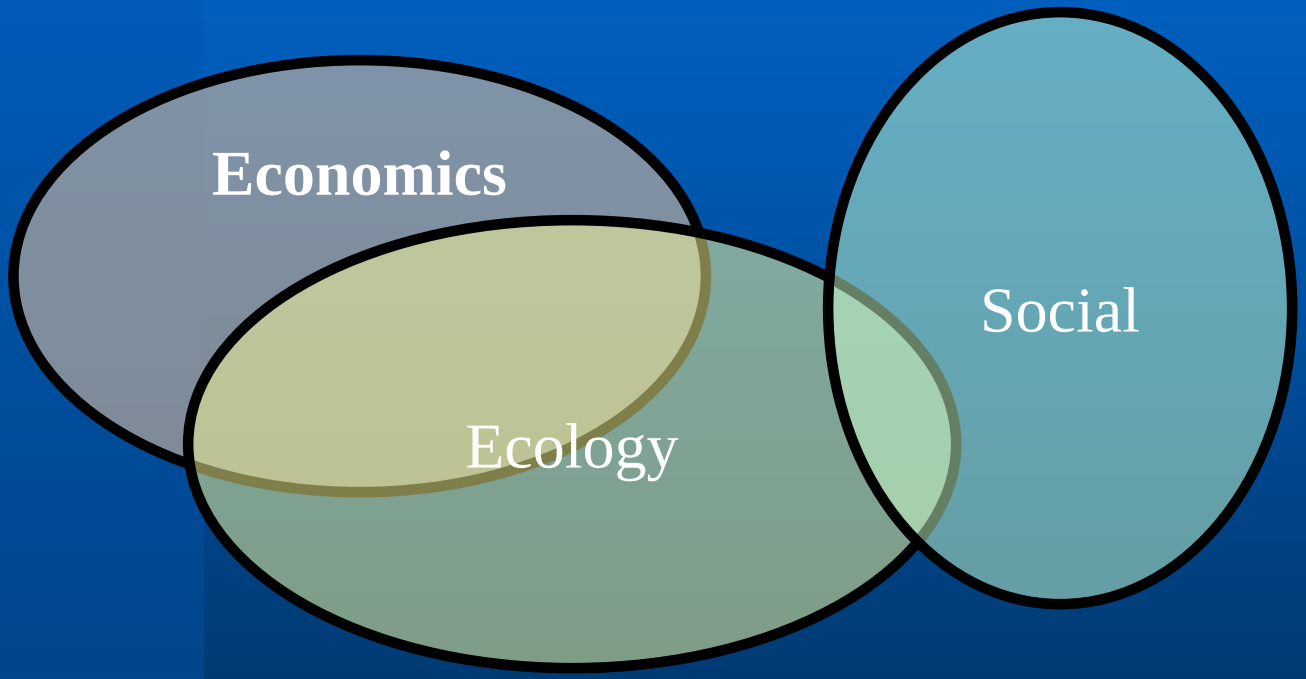
Sustainable Forestry

- **Definition conveys the notion that sustainability applies to many resources in addition to timber; considers the needs of future generations as well as those of the present; is concerned with ecological functions and condition; and is as much a social and economic as a bio-physical process**

Sustainability Occurs at the Intersection



Not Sustainable If No Intersection



Observations

- A balance of ecological and economic values in a socially acceptable fashion
- The use of proper 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

Sustainable Forestry

- **Requires that we adopt an integrated approach that simultaneously considers utilitarian values as well as ecological and social values**
- **May accomplish this in several ways**

Models of Sustainability

- **Find best economic solution subject to ecological sustainability constraints**
- **Find best ecological solution subject to economic sustainability constraints**
- **Jointly optimize ecological and economic values**

Observations

- **The challenge to actually define and implement sustainable forestry is tremendous**
- **It may be the greatest challenge for educators, resource managers, scientists, and policy makers at the start of this Century**

The Context of Sustainability

- **Natural resource managers have a long tradition based on the concepts of sustainable resource use, protection, and carrying capacity**
- **Sustainable resource use has largely been synonymous with maximum biological sustained yield**

The Context of Sustainability

- Few concepts have received more attention in natural resource management than that of sustained yield
- The basic idea is that existing stocks of natural resources should be managed to guarantee that rates of replenishment (restocking and growth) are in balance with rates of removal (harvest)

The Context of Sustainability

- Models largely constructed on the basis of biological productivity have been used to manage most of the world's renewable natural resources
- The concepts of carrying capacity and resource protection are largely enabling agents for sustained yield

The Context of Sustainability

- A century of economic research has failed to convince most natural resource managers to consider sustained economic efficiency on par with maximum biological productivity
- Economic efficiency requires a well defined property rights system to function properly

The Context of Sustainability

- Traditional models of maximum biological yield possess no inherent measures of equity – either economically or socially
- Further, they provide no guidance during the transition stage when renewable resource stocks are built up or drawn down to sustainable levels

The Context of Sustainability

- **Traditional concepts are too narrow and simplistic to serve as valid models for the future sustainable management of renewable natural resources**

Multiple Use Concept

- Historically used as a policy instrument for rationalizing uses across a landscape
- Is largely normative and not prescriptive
- Too closely identified with forest outputs instead of desired future states. Multiple use must be modified to meet the changing demands of society.
- A new paradigm that extends our traditional reliance on multiple outputs is needed. Sustainability offers this promise.

The Context of Sustainability

- **The current use of the concept of sustainability is much broader than the twin concepts of sustainable resource use and multiple use**
- **Sustainability requires an explicit consideration of ecological, economic and social factors not found in the above natural resource concepts**

Seeking Sustainability

- **This brief historical review illustrates the new complexities sustainability attempts to explicitly consider**
- **Our traditional models and management concepts worked well in the last Century but must be updated and/or replaced to serve the next Century**

Case Study

Case Study Observations

- There are several examples of where we have successfully achieved adoption of a sustainable forestry program in Washington
- Some may argue that the HCP for our WDNR lands coupled with regulatory practices is an example of such a program

Case Study Observations

- **Others might argue that forest lands certified under the FSC or SFI principles qualify as examples**
- **Others would cite the lack of compliance with the seven indicators and 67 criteria to the Montreal Process to which the USA agreed**

Case Study Observations

- **Case study involves the Washington State trust lands that are managed by the Washington State Department of Natural Resources**
- **We consider the 1.4 million acres lying west of the crest of the Cascade Mountains**

Key Statutes: Multiple Use

- **The management and administration of state-owned lands under the jurisdiction of the department of natural resources to provide for several uses simultaneously (on a single tract and/or planned rotation) of one or more uses on and between specific portions of the total ownership (RCW 79.68.020)**

Key Statutes: Sustained Yield

- **Management of the forest to provide harvesting on a continuing basis without major prolonged curtailment or cessation of harvest (RCW 79.68.030)**

Timber Harvest Policy

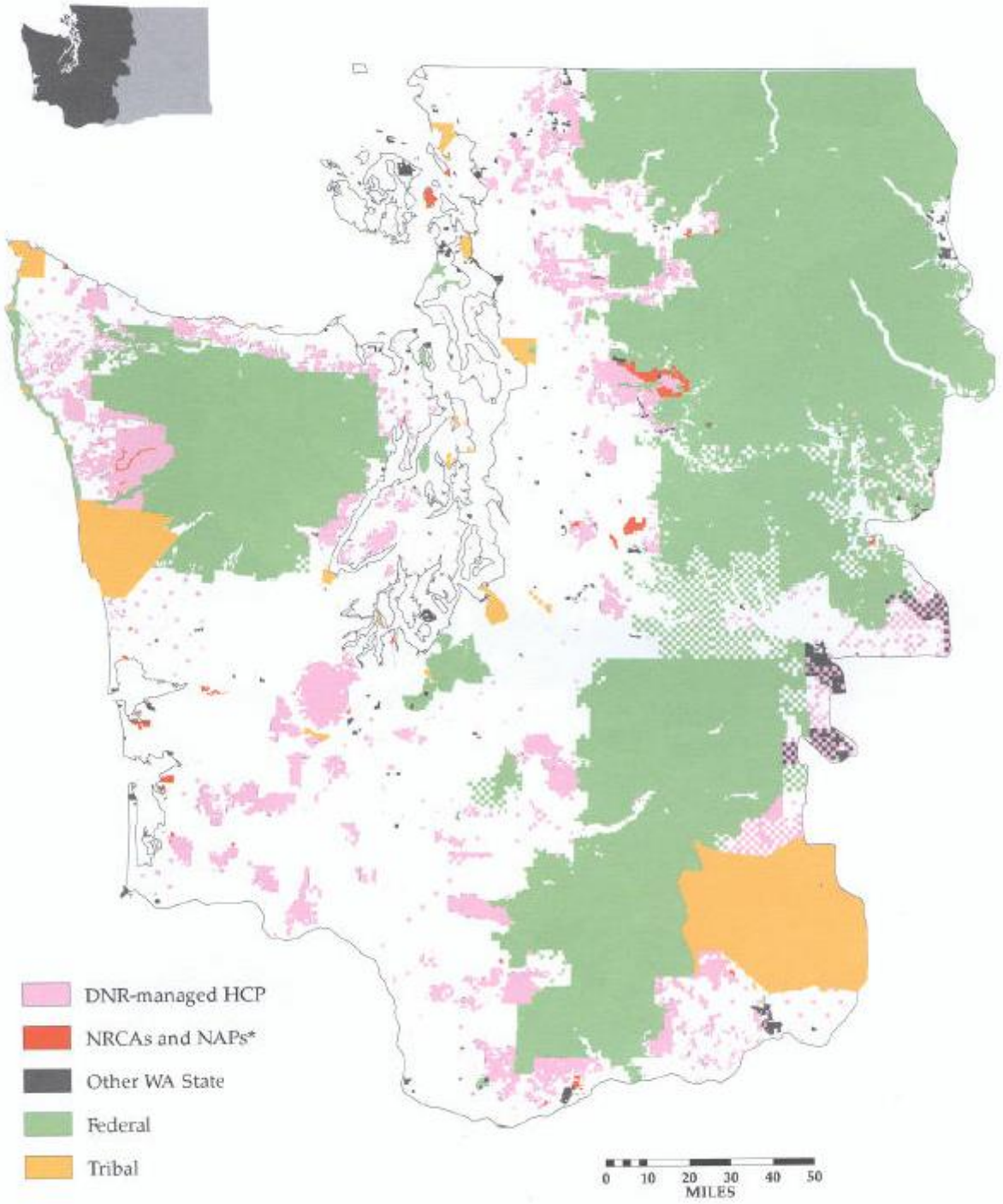
- **The Department will manage state forest lands to produce a sustainable even flow harvest of timber subject to economic, environmental and regulatory considerations (Forest Resource Plan, 1992)**

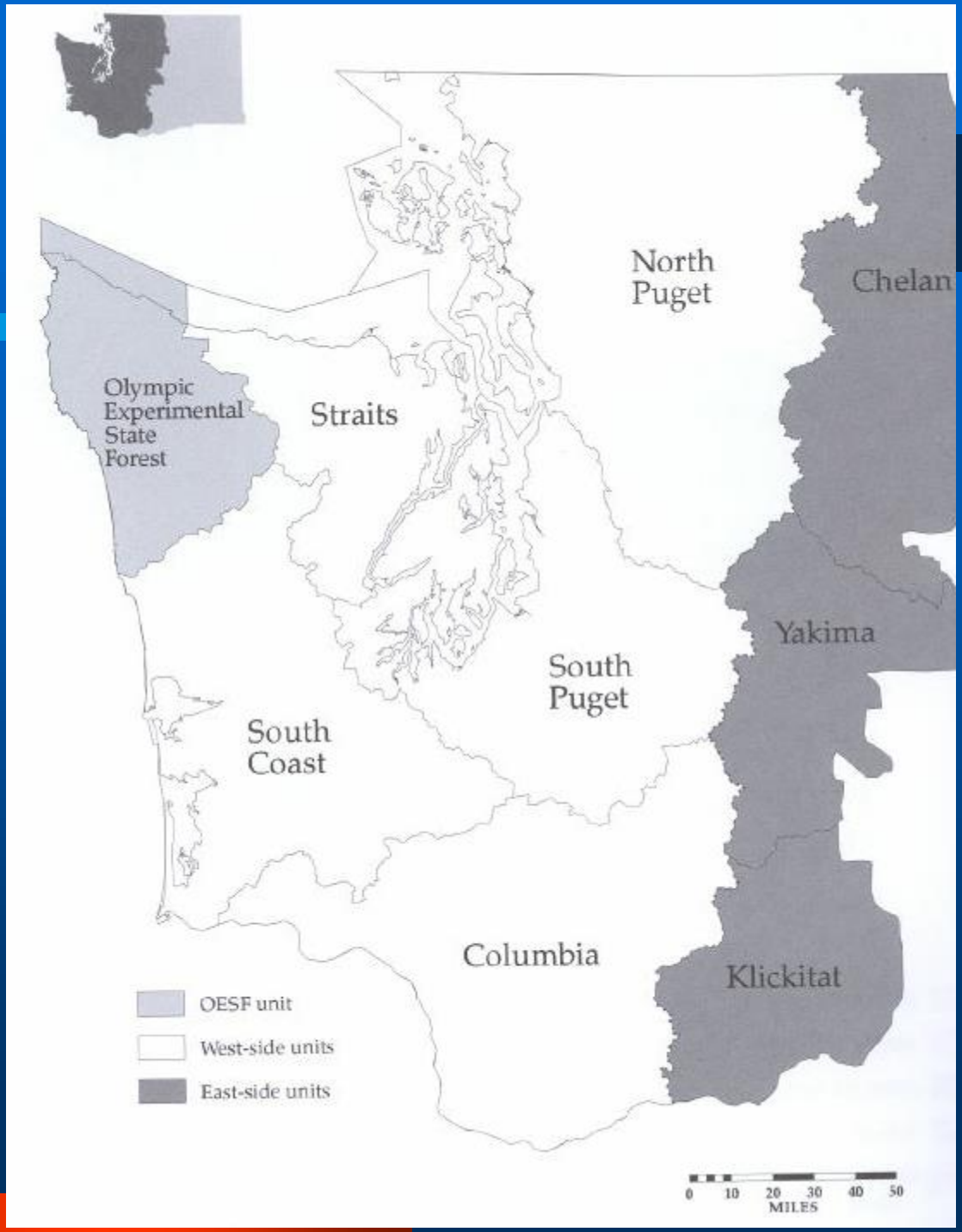
Forest Planning Is Complex

- **Multiple objectives and players (tradeoffs)**
- **Long time horizons and uncertainty**
- **Hierarchical in nature**
  - **Strategic (long term sustainability plans)**
  - **Tactical (landscape plans)**
  - **Operational (project plans)**
- **Challenging to coordinate levels of planning (time, space, data)**

Forest Planning Is Complex

- **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


DNR-managed HCP
NRCAs and NAPs*
Other WA State
Federal
Tribal
0 10 20 30 40 50
MILES


North Puget
Chelan
Olympic Experimental State Forest
Straits
Yakima
South Puget
South Coast
Columbia
Klickitat
OESF unit
West-side units
East-side units
0 10 20 30 40 50
MILES

Planning Scenarios

- **DNR: Uses 60+ year rotations; on/off base acre allocations as shown; no wildlife thins; no partial cuts in the 60-70 year old age classes; even flow harvest constraints; no harvests in riparian or wetland areas; nondeclining late seral conditions**

Planning Scenarios

- **ALTS: Uses 50+ year rotations; on/off base acre allocations as shown; wildlife thins; partial cuts in the 60-70 year old age classes; + 25% change in harvest from one decade to the next; partial harvests in riparian or wetland areas if on-base; nondeclining late seral conditions**

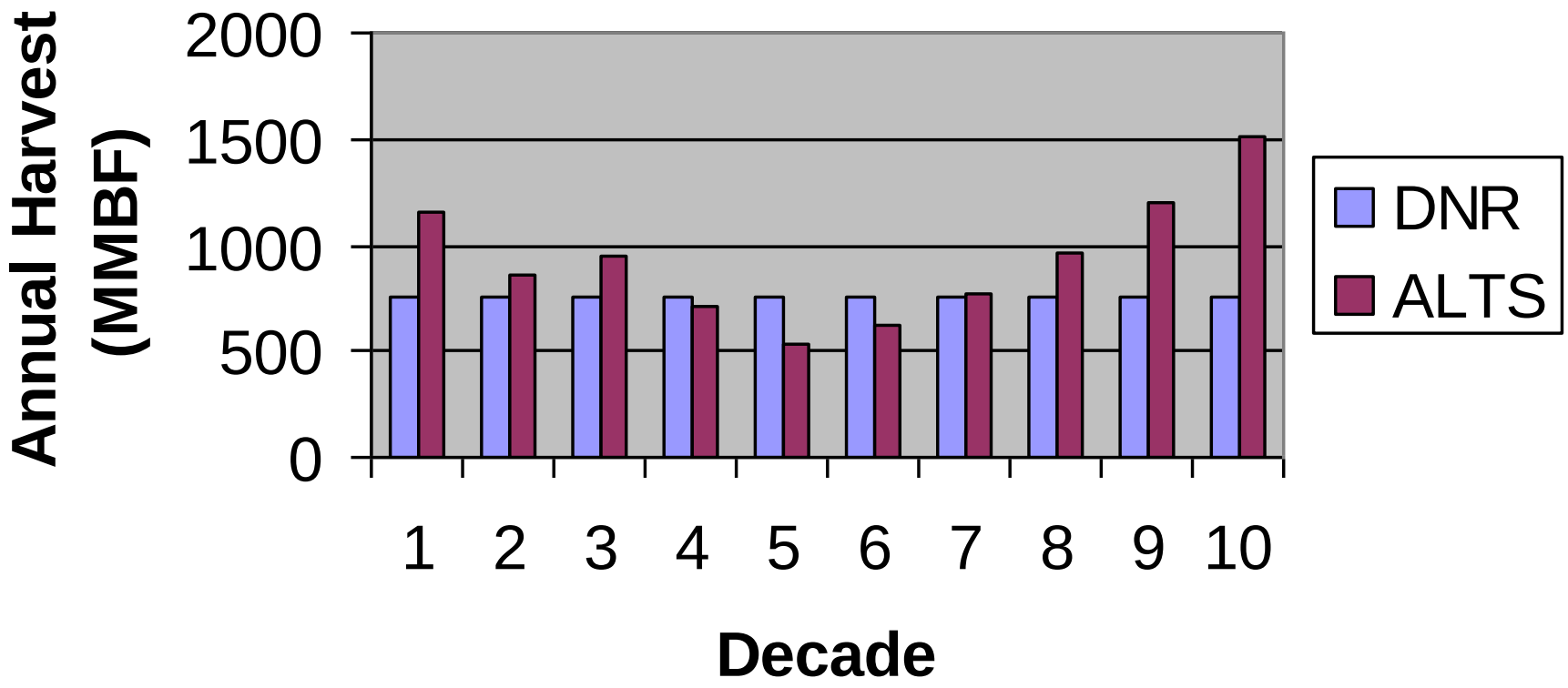
W. Washington Acreage Summary

	ALTS	DNR
	Acres	Acres
On Base	1,178,154	1,035,586
Off Base	247,937	390,508
Total	1,426,091	1,426,094

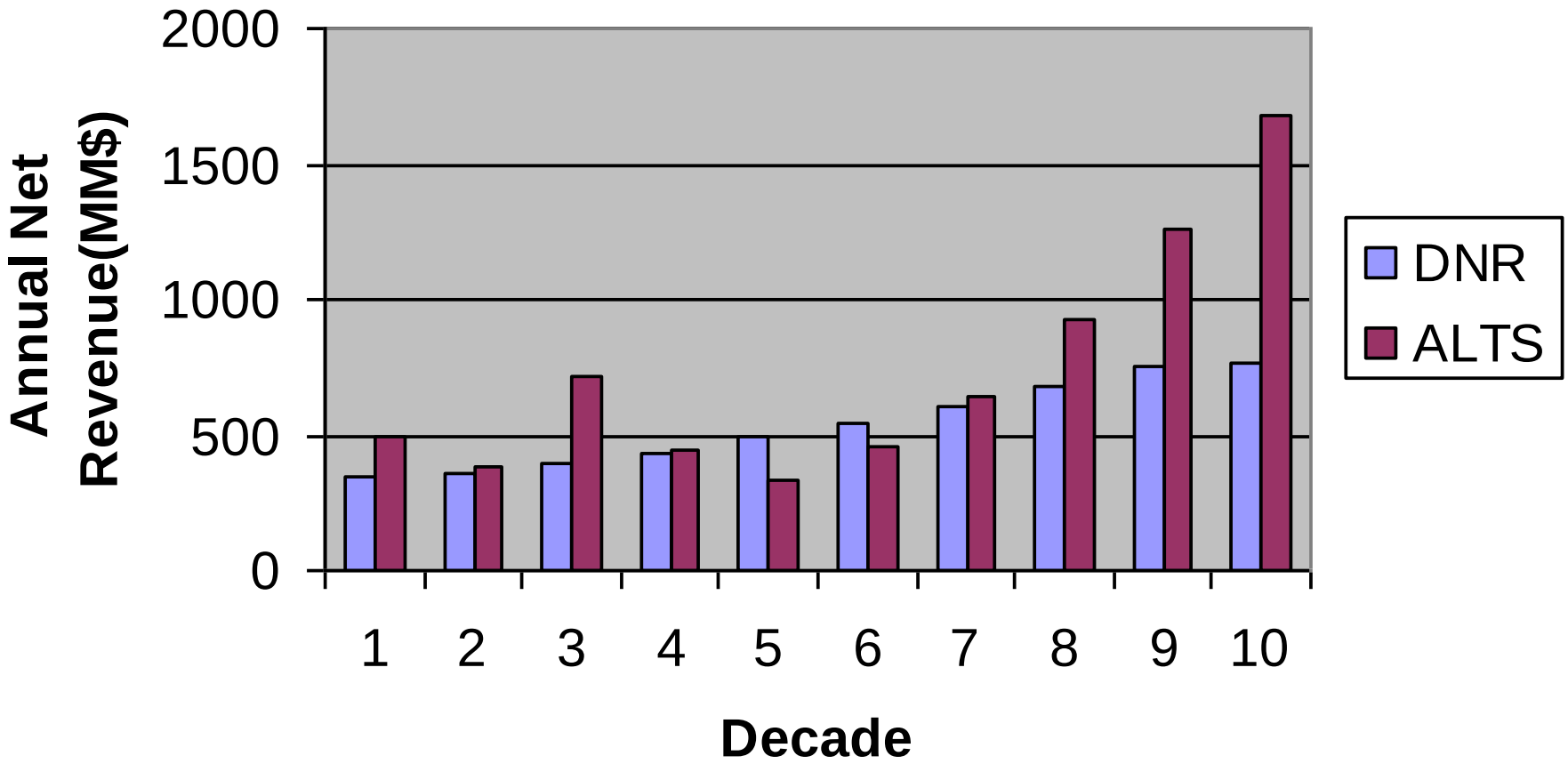
Scenario Results

	Asset Values ($ Billion)			
	DNR	ALTS	% Difference	
W Washington	7.505	9.799	31%	ACRES
North Puget	1.945	2.487	28%	381,403
South Puget	0.85	1.091	28%	141,815
Columbia	1.581	1.976	25%	283,021
Straits	0.715	1.034	45%	113,143
OESF	0.781	1.379	77%	240,835
South Coast	1.416	1.746	23%	265,877
Six Unit Total	7.288	9.713	33%	1,426,094
% Difference	3%	1%		

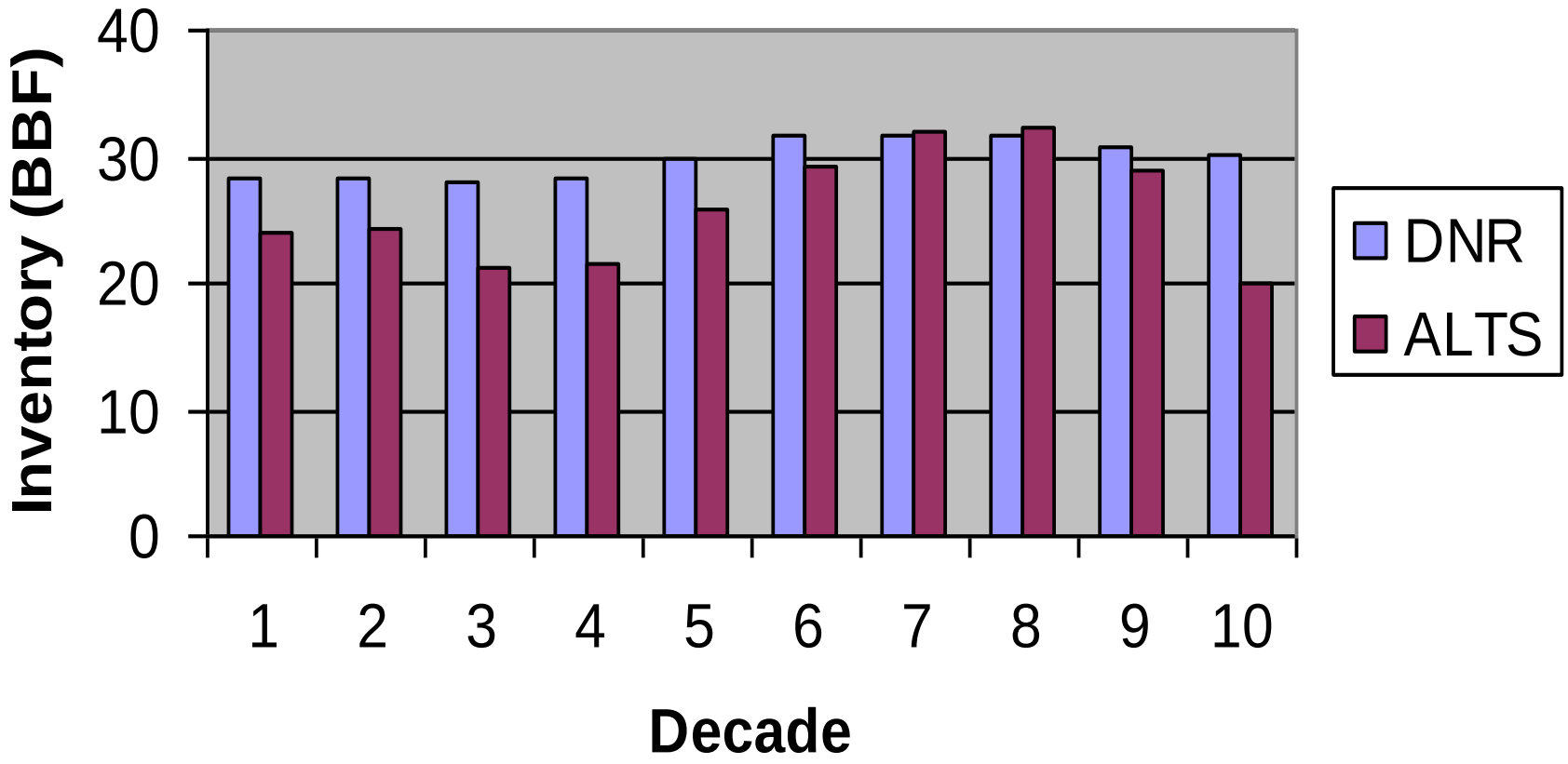
W Washington Timber Harvest (DNR$7.5;ALTS$9.8)



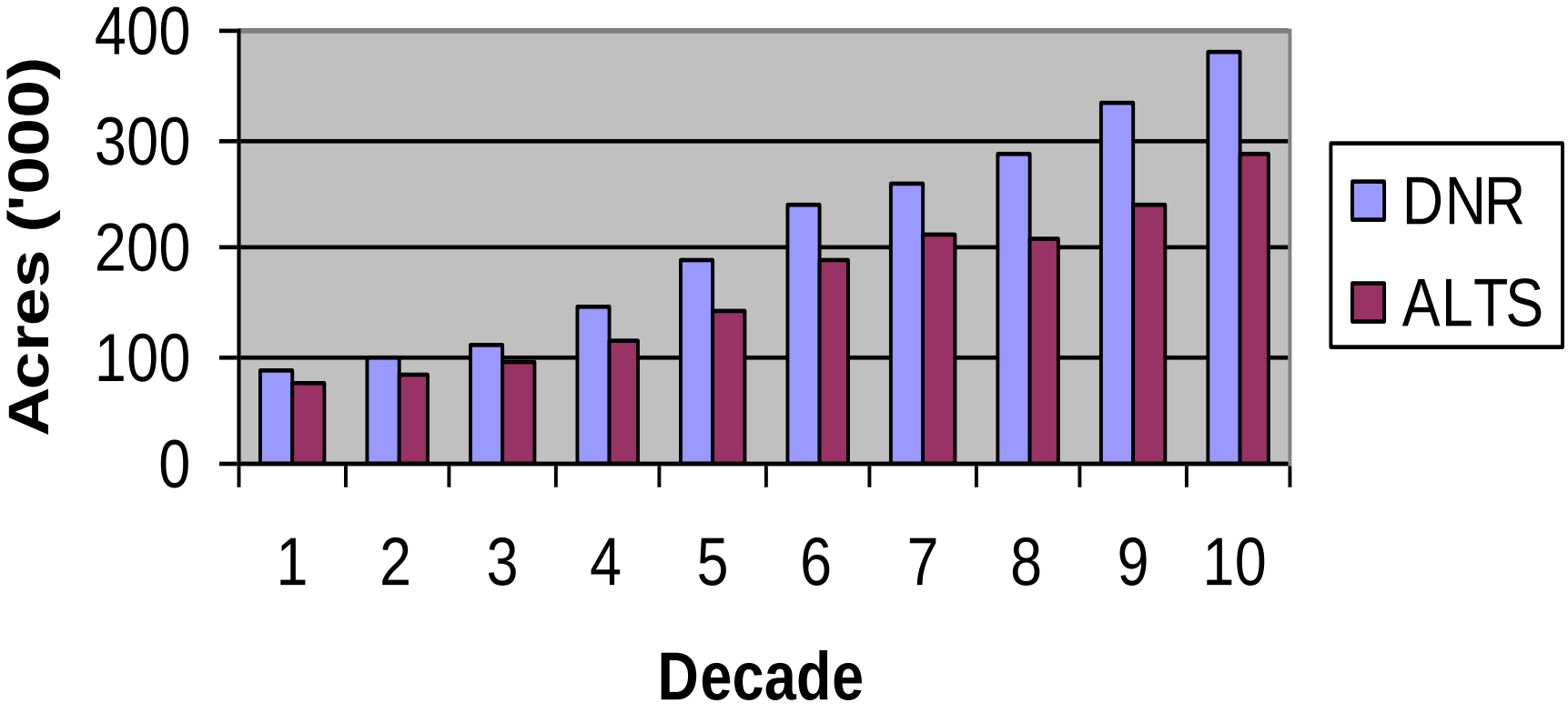
W Washington Net Revenue

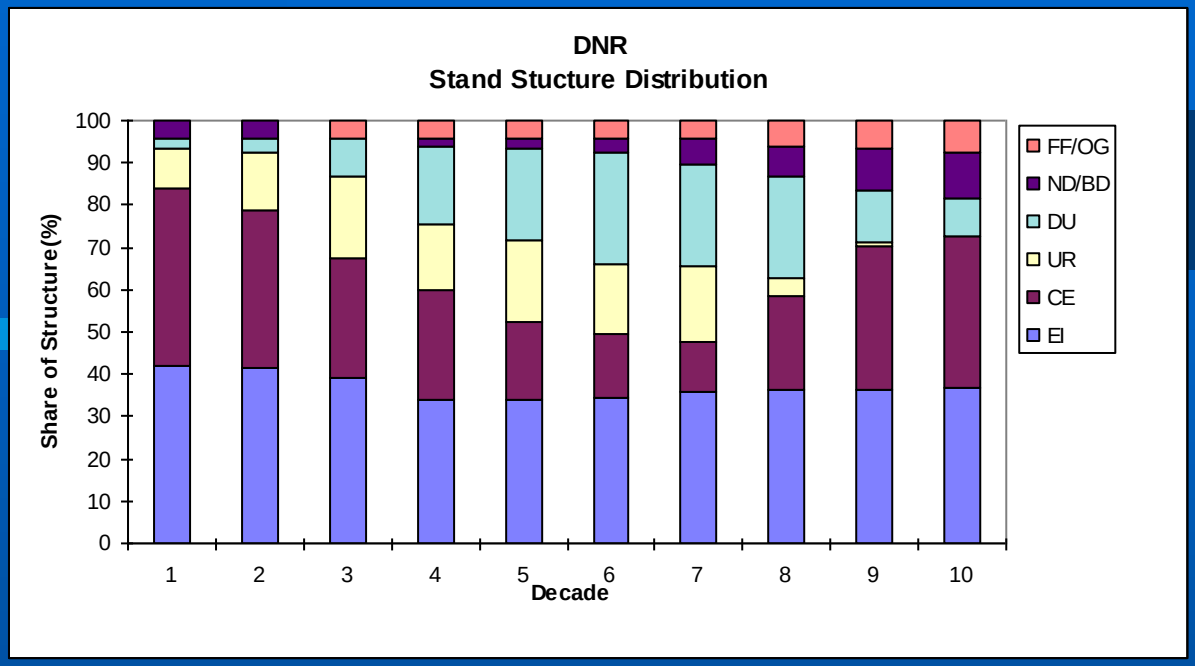


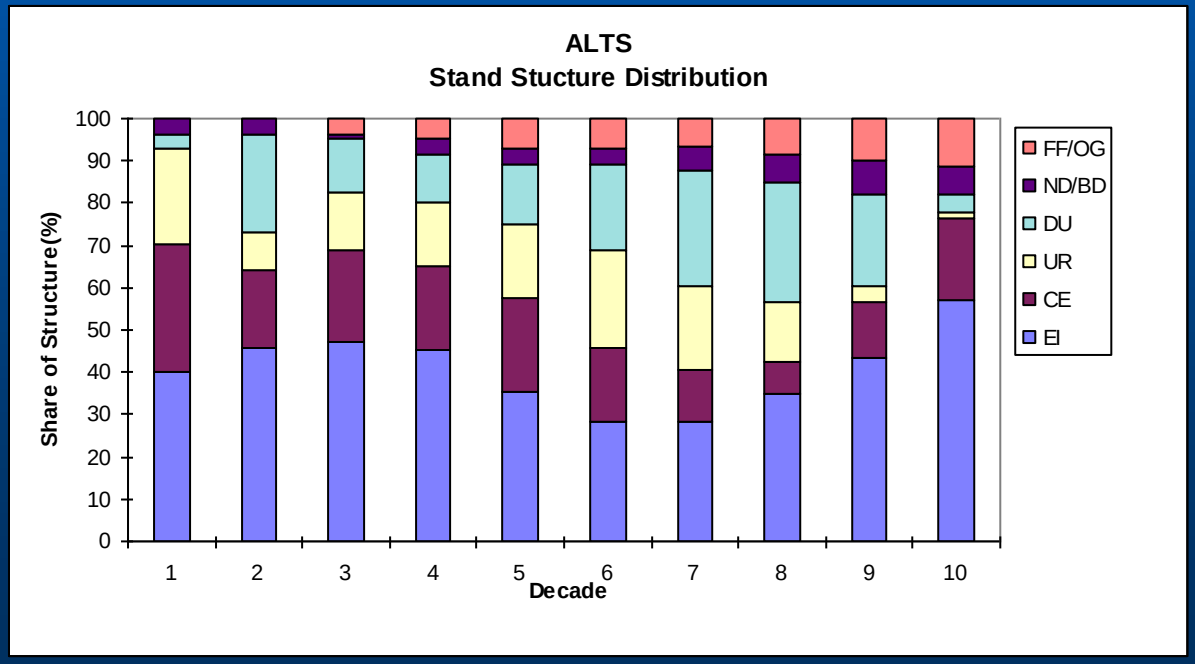
W Washington Inventory



W Washington Old Forest Habitat




DNR
Stand Stucture Distribution
Share of Structure(%)
100
90
80
70
60
50
40
30
20
10
0
1
2
3
4
5
6
7
8
9
10
Decade
FF/OG
ND/BD
DU
UR
CE
EI


ALTS
Stand Stucture Distribution
Share of Structure(%)
100
90
80
70
60
50
40
30
20
10
0
1
2
3
4
5
6
7
8
9
10
Decade
FF/OG
ND/BD
DU
UR
CE
EI

College of Forest Resources

College Observations

- **Our College is adopting sustainability as its key integrating concept**
- **Our undergraduate and graduate programs are being redesigned to support: sustainable forestry, sustainable urban environments and sustainable enterprises**

College Mission Statement

- **Study and investigate the functionality and sustainability of natural resource systems**
- **Natural and managed environments**
- **Interdisciplinary approach across multiple scales of urban and wildland landscapes**

College Vision Statement

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

Sustainability Is The Integrating Goal

- **Sustainable forestry : Managed and natural forests**
  - **Plantations, parks, reserves, watersheds**
- **Sustainable urban environments**
  - **Urban forestry, horticulture, public gardens, green belts, restoration ecology, water, wildlife**
- **Sustainable forest enterprises**
  - **Paper mills, precision forestry technologies, tourism, recycling, wood products, non-timber products**

College Observations

- **Have identified two undergraduate programs the College will offer**
  - **Paper Science & Engineering**
  - **Environmental Science & Resource Management**
- **Building an integrated curriculum with a small number of tracks for each program**

Environmental Science and Resource Management

- **The undergraduate curriculum has a solid sustainability core (20 credits) taken by all students**
- **General UW requirements (60 credits)**
- **Restricted electives (35 credits)**
- **Free electives (65 credits)**

Graduate Education

- **Offer professional fifth year Master's degrees to provide in depth education and training**
- **Consolidate learned degrees (MS and PhD) into one program with specialization into specific disciplines**

Graduate Education

- **Professional Programs**
  - **Master of Forestry**
  - **Master of Environmental Horticulture**
- **Learned Programs**
  - **Master of Science**
  - **Doctor of Philosophy**

College Observations

- **Use sustainability to help design and formulate our future research, development and outreach agendas**
- **Search for exciting interdisciplinary opportunities at the intersections of traditional sciences that will further promote new research**

College Observations

- **Exciting times lie ahead as we incorporate the concept of sustainability into our programs; focus our resources on our high priority programs; and respond to the challenges that lie ahead**

College Observations

- **Our goal is to position the College as the leading school of forest resources in No. America by focusing on natural resource and environmental sustainability.**
- **Additional details concerning sustainability at:**

  http://faculty.washington.edu/bare/sus2.html

The End