Sustainable Forestlands

Silviculture - ESRM 323

Sustainable Forestlands

- Sustainability – early efforts in U.S.
- Sustained Yield Management
- Sustainable Forest Management
- Assessing Forest Sustainability
- Criteria & Indicators / Certification
- SFM practices
- Concluding thoughts

Sustainability

- By 1870s large tracts of timberland were in the hands of relatively few owners in the U.S.
- These owners had philosophy that timber was a "one-time" crop
  - No reforestation
  - No fire suppression efforts
- 1891 saw congress pass the "Forest Reserve Act" U.S. presidents could now set aside reserves on public lands to assure forests for the future

Sustainability

- Clarke-McNary Act passed 1924
  - Authorized money to be spent on fire control in cooperation with states
  - Authorized federal aid to states to set up nurseries for reforestation
- McSweeney-McNary Research Act passed 1928
  - Authorized federal money to investigate best methods for growing, managing, utilizing timber, forage, other products, forest protection, watershed maintenance

Sustainability

- Soil Conservation Service authorized 1935
  - Recognized need to conserve soil
  - Now named Natural Resource Conservation Service (NRCS)
- Multiple-Use, Sustained Yield Act passed 1960
  - Legally applied only to national forests but foresters and segments of the public embraced the concept as part of the answer in stretching forest resources
  - National forests shall be administered for outdoor recreation, range, timber, watershed, and wildlife and fish purposes
  - Defines multiple use and sustained yield

Sustainable Forestry

- Sustained Yield Management (SYM) …
  - ✓ Seeks to sustain the flows of specific products to meet human needs, within constraints imposed to minimize adverse effects to other resource values
  - ✓ Manipulations of the forest designed to maximize product yield and/or efficiency of operations
  - ✓ Forest stand level focus, little regard for spatial relationships

Sustainable Forestry

- Sustained Yield Management (SYM) …
  - ✓ Forests primarily a source of products, jobs, income, human activities were largely treated as externalities
  - ✓ Forest planning left largely in the domain of specialists and administrators

Sustainable Forestry

- Sustainable Forest Management (SFM)
  - ✓ Ecosystem integrity provides underpinnings for sustaining product flows, ecological services, environmental health and a full array of socio-economic values over the long haul
  - ✓ Forests are dynamic systems; most objectives can best be achieved by designing treatments and disturbance patterns that “work with nature” in addition to increasing efficiencies

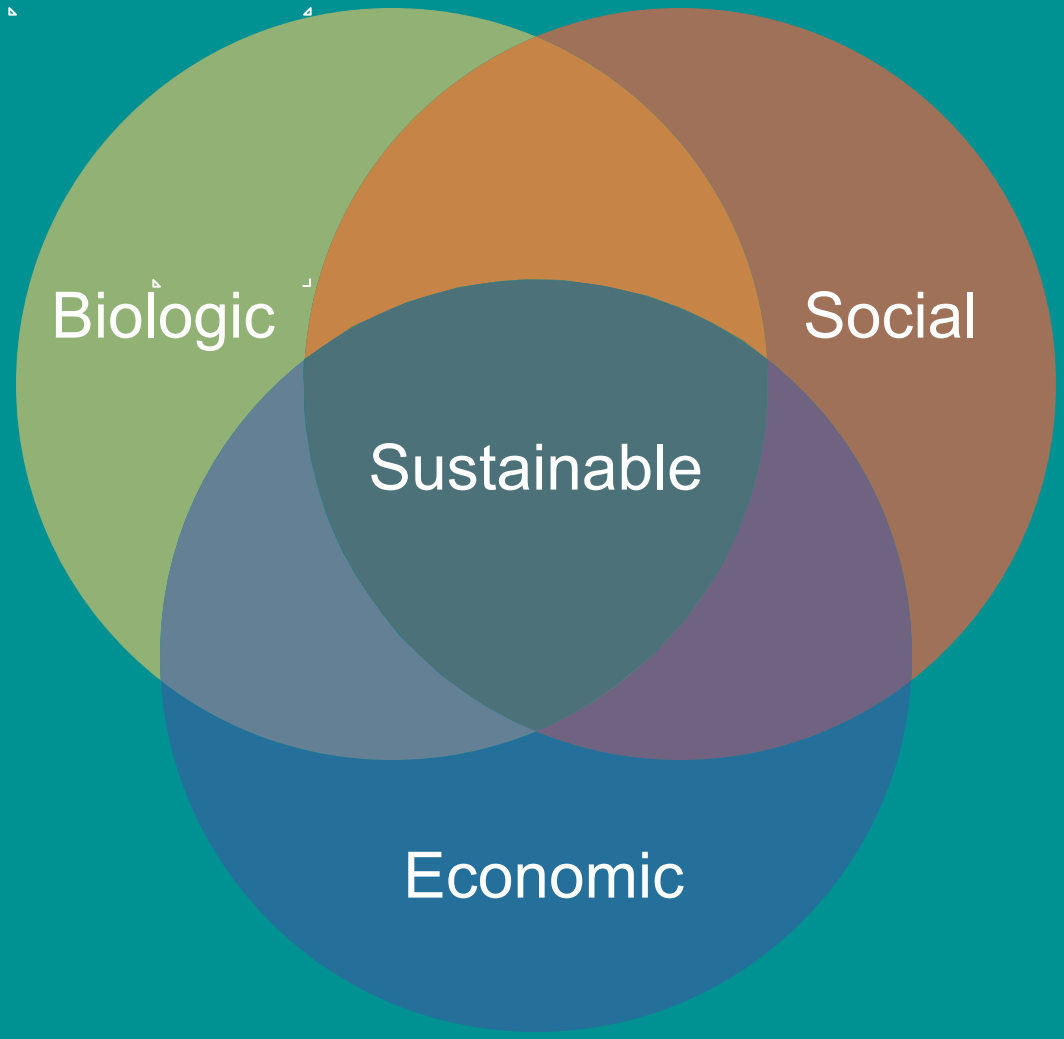
Sustainable Forestry

- Sustainable Forest Management (SFM) …
  - ✓ Conservation of biological diversity, watershed health, landscape aesthetics, consideration of species with large home range, many other objectives require linkages between scales
  - ✓ WAY LONG-TERM not just a rotation or two; decisions today must not foreclose on future options for succeeding generations

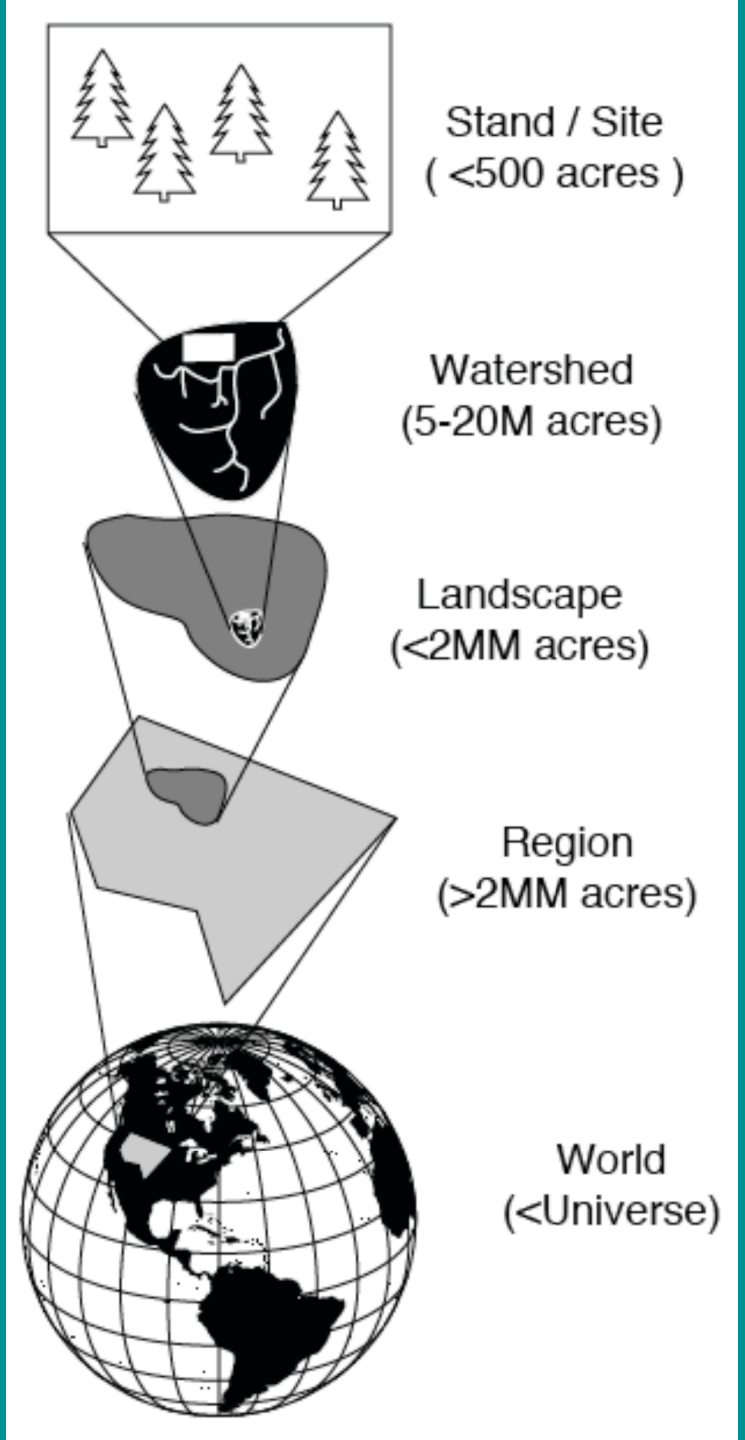
Sustainable Forestry

- Sustainable Forest Management (SFM) …
  - ✓ Interdependence of people and ecosystems; each profoundly affected by the other, sense of self and place, not just jobs, income, products
  - ✓ Need meaningful participation by all stakeholders in decision making, benefit is derived by involving an informed public

Three tenets of Sustainability



Ecosystem Management



Sustainable Forestry

- Sustainability criteria
  - Biologic / Ecologic / Environmental
  - Social
  - Economic
- Forest management situations vary greatly; ecologically (sensitivity, resilience), economically (diversity, stability), and in their social context (sensibilities of local people, governmental priorities)
- There's no cookbook solution

Assessing Forest Sustainability

- Earth Summit (UNCED) in 1992 called upon all nations to ensure sustainable development, including all forest mgt.
- Majority of European countries convened in 1993 & endorsed the Helsinki Process
  - Focused on developing criteria and indicators and how they can help define and measure progress towards sustainable development of forests
  - Developed 6 criteria with a total of 27 indicators

Assessing Forest Sustainability

- Many non-European countries subscribed to the Montréal Process in 1995 (the Santiago Declaration)
  - Subsequently, the Montréal Process Working Group identified 7 criteria and 67 indicators

Criteria & Indicators

- Criteria
  - A category of conditions or processes by which sustainable forest management may be assessed
- Indicator
  - A measure (measurement) of an aspect of the criterion; A quantitative or qualitative variable which can be measured or described and which, when observed periodically, demonstrates trends

Process Criteria

1. Conservation of biodiversity
2. Conservation & maintenance of soil and water resources
3. Maintenance of productive capacity of forests (wood and non-wood)
4. Maintenance / enhancement of cultural and recreational functions
5. Maintenance of forest ecosystem health & vitality
6. Maintenance of forest contribution to global carbon cycle
7. Existence of legal, policy and institutional framework that facilitates SFM (MP only)

Criteria & Indicators

Criterion 1: Conservation of biological diversity

- Ecosystem diversity (5 indicators)
  1. Extent of area by forest type relative to total forest area
  2. Extent of area by forest type and by age class or successional stage
  3. Extent of area by forest type in protected area categories as defined by established classification systems
  4. Extent of areas by forest type in protected areas defined by age class or successional stage
  5. Fragmentation of forest types
- Species diversity (2 indicators)
- Genetic diversity (2 indicators)

Criteria & Indicators

- Large scale – intended to be a framework for all temperate and boreal forests for analysis within a country and for comparison between countries
- Contributes to society to enhance our understanding of sustainable management
- Voluntary approach
- Monitoring over time – commitment to data collection and reporting
- Largely descriptive in nature – no inherent performance standards

Certification Systems

- Small scale – intended for single ownership or group of ownerships
- Provides a certain performance expectation, compared against a standard
- Addresses goals in a prescriptive way
- Directed toward marketplace in the interest of differentiating landowners and products flowing from their forests
- Voluntary participation

Forest Management Certification

- Process by which forest practices are evaluated against a set of standards
- “Certification” is now understood to mean “independent verification” of conformity to standards
- Tool to document and reward specific forest mgt. practices
- Assures consumers of forest products that their purchase comes from a forest whose management meets a certain sustainability standard
- On-the-ground assessment of a landowner’s forest practices

Forest Management Certification

- Forest Stewardship Council (FSC)
  - Independent, non-profit, non-governmental organization founded in 1993 by a group of rep's from environmental and conservation groups, timber industry, forestry profession, indigenous peoples' organizations, community forestry groups from 25 countries
- Sustainable Forestry Initiative (SFI)
  - Program created by the American Forest & Paper Association (AF&PA) in 1994

Forest Stewardship Council

- Ten Principles (56 Criteria)
  - Compliance with Laws and FSC principles
  - Tenure and Use Rights and Responsibilities
  - Indigenous Peoples' Rights
  - Community Relations and Worker's Rights
  - Benefits from the Forest
  - Environmental Impact
  - Management Plan
  - Monitoring and Assessment
  - Maintenance of High Conservation Value Forests
  - Plantations

Sustainable Forestry Initiative

- SFI Standard spells out the requirements of compliance with the program
- SFI participants are required to support SFM on lands they manage and promote such practices on other forestland
- SFI principles are at the core of SFI Standard
  - Principles call on participants to meet market demands using environmentally responsible practices promoting protection of wildlife, plants, soil, air and water quality to ensure the future of the nation's forests

Sustainable Forestry Initiative

- Principles translate to 12 objectives that Promote
  1. Broadening practice of sustainable forestry
  2. Ensuring prompt reforestation
  3. Protecting water quality
  4. Enhancing wildlife habitat
  5. Minimizing the visual impact of harvesting
  6. Protecting special sites

Sustainable Forestry Initiative

- Twelve Objectives (cont'd)
  7. Contributing to biodiversity
  8. Continuing improvements in wood utilization
  9. Continuing prudent use of forest chemicals to help ensure forest health
  10. Fostering the practice of sustainable forestry on all forestlands
  11. Publicly reporting on their progress
  12. Providing opportunities for public outreach

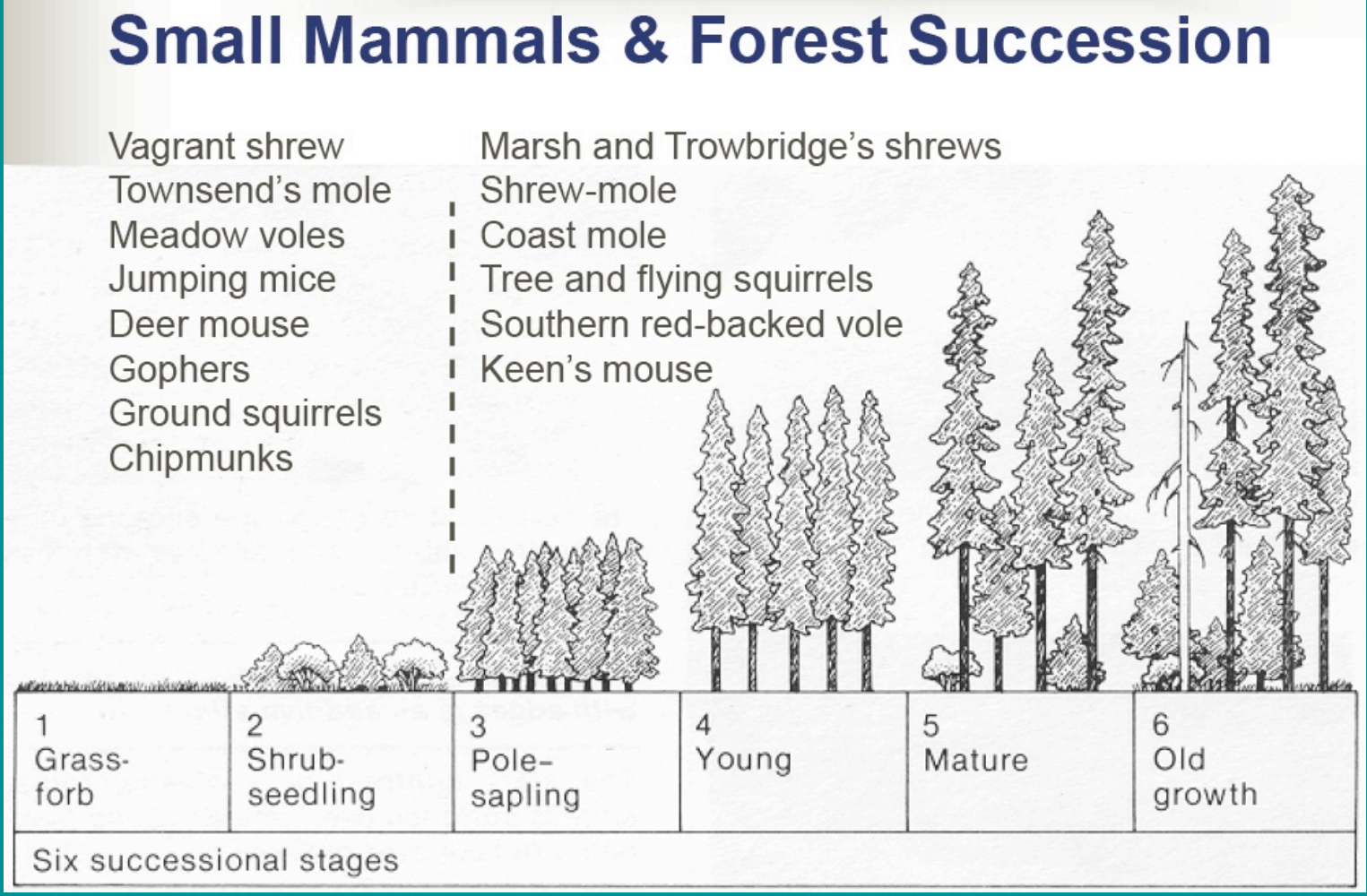
Small Comparison

- Plantations
  - MP Indicator 2c
    - The area of growing stock of plantations of native and exotic species
  - FSC Criterion 6.10
    - Forest conversion to plantations or non-forested land uses shall not occur, except in circumstances where conversion 1) entails a very limited portion of the FMU, 2) does not occur on high conservation value forest areas, 3) will enable clear, substantial, additional security of long-term conservation benefits across the FMU

Small Comparison

- Plantations
  - SFI Objective 4.1.5.1.4
    - Program participants shall use harvest methods, age classes, and judicious placement of harvest units to promote diversity across the forest landscape

Landscape Diversity



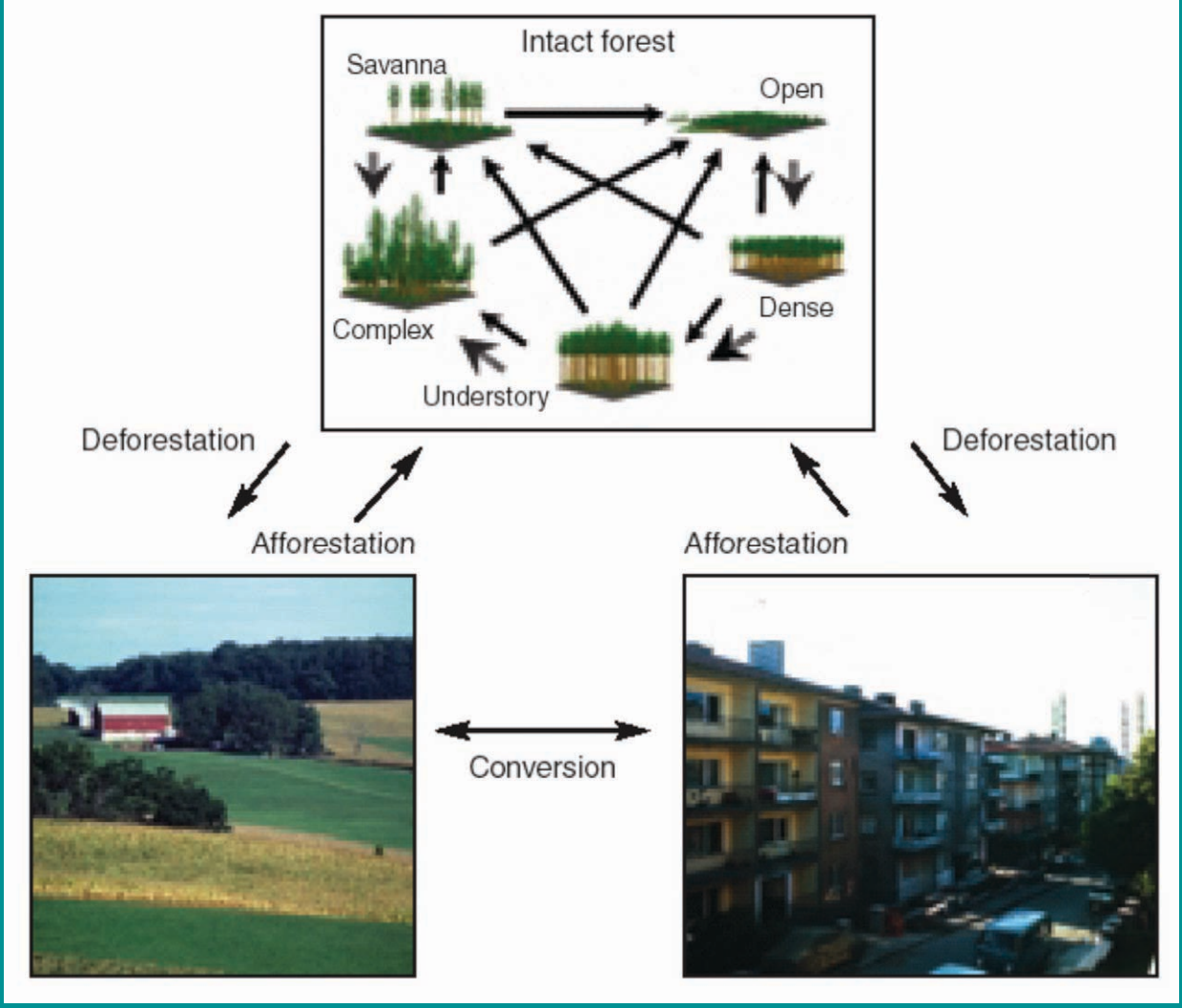
SFM Principles & Practices

- Maintain ecosystem integrity; protect existing forestland
  - Reduce catastrophic fire hazard
  - Reduce damage from pests
  - Reduce nutrient depletion
  - Reduce erosion (roads, harvesting, e.g.)
  - Reduce conversion to other uses

Protect Existing Forestland

Protect Existing Forestland

Protect Existing Forestland



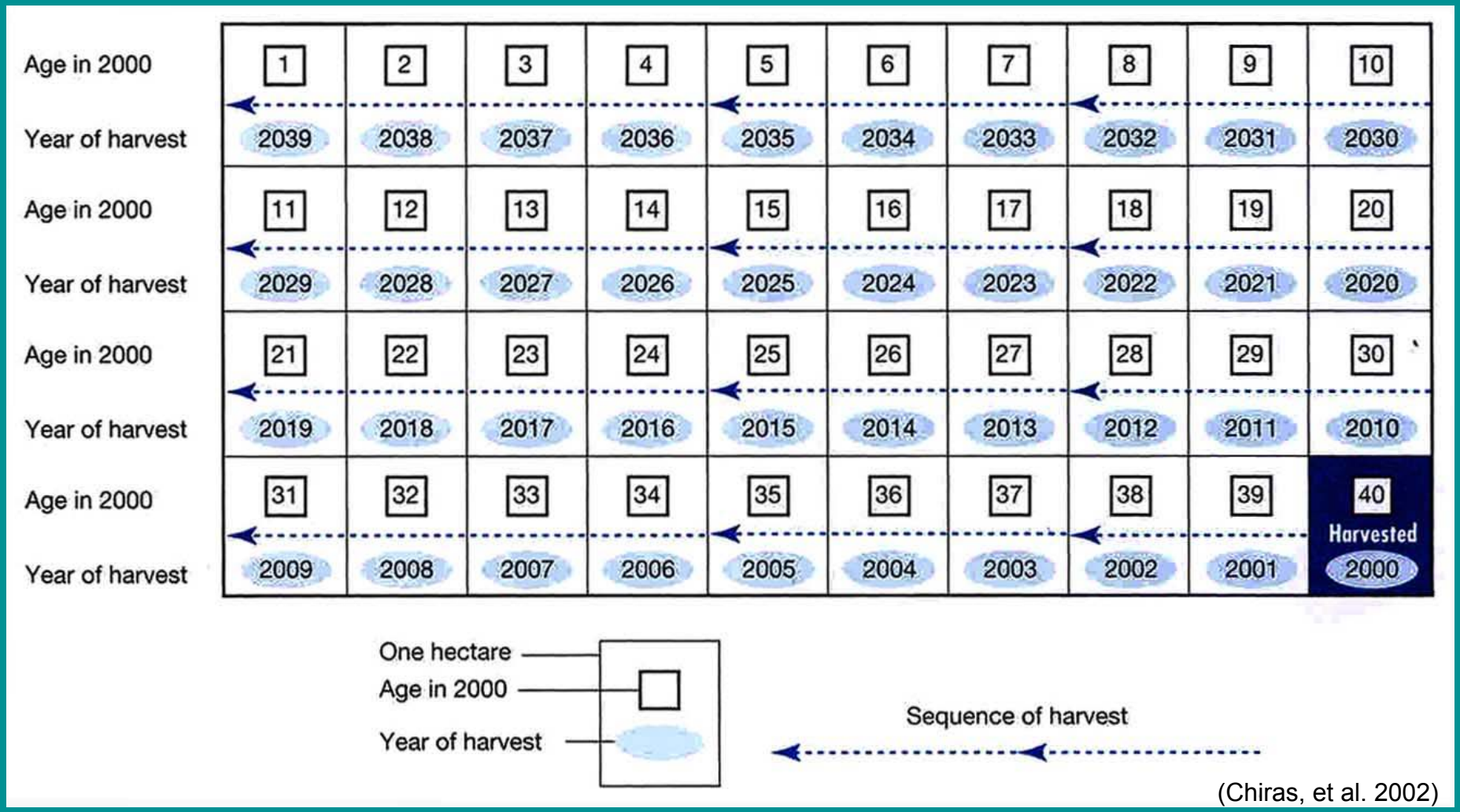
SFM Principles & Practices

- Forests are dynamic systems; design treatments to “work with nature”
  - Choice of regeneration method
    - Clearcutting
    - Seed-tree
    - Shelterwood
    - Selection method (individual, group, strip)
  - Choice of intermediate treatments
    - Thinning
    - Pruning
    - Fertilizing

SFM Principles & Practices

- Conserve Biological diversity, watershed health, landscape aesthetics, etc.
  - Use mixed species in planted forests
  - Erosion harms twice
  - Design stand treatments with consideration for landscape scale

Conserve Landscape Aesthetics



(Chiras, et al. 2002)

Conserve Landscape Aesthetics

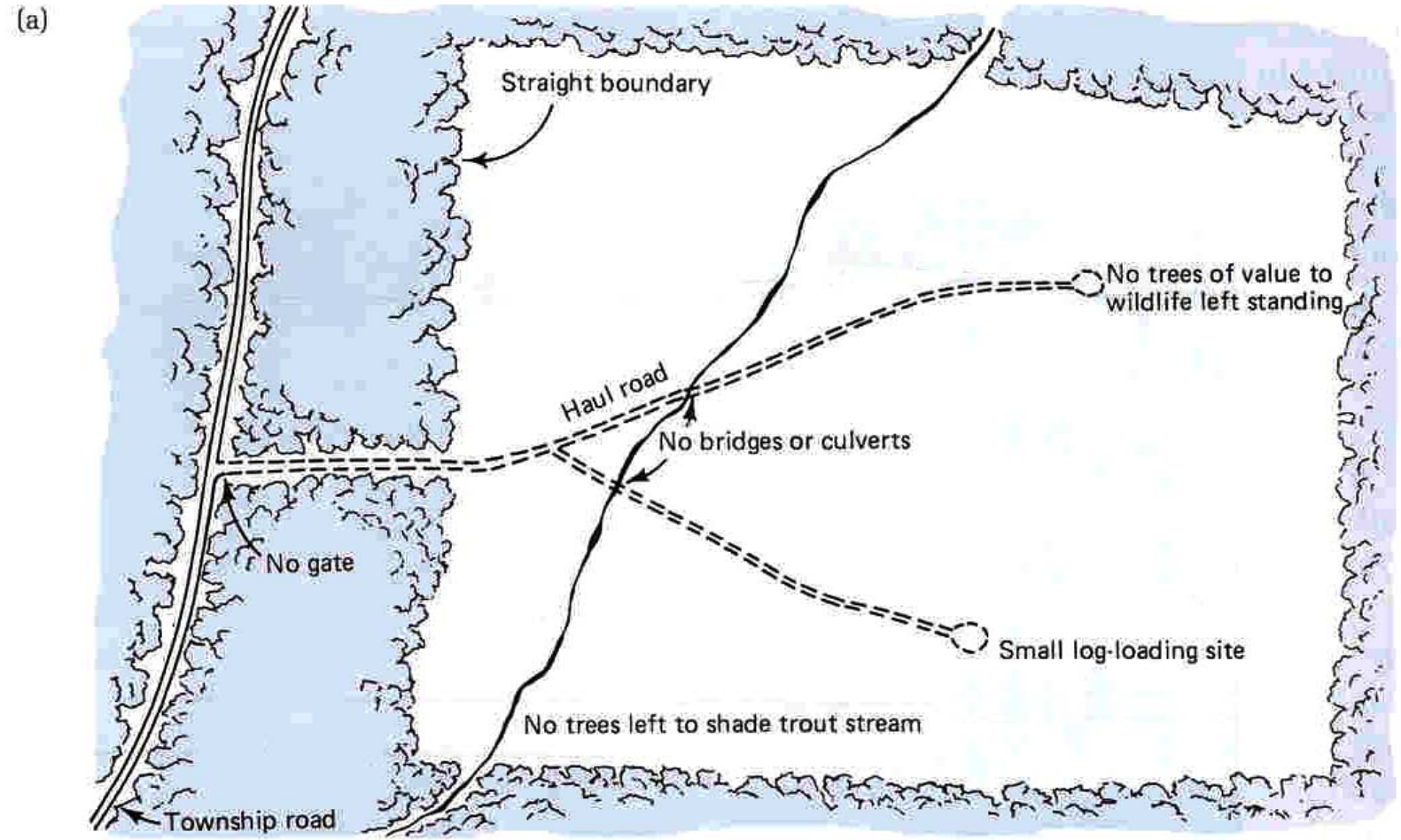


FIGURE 10.41 Clearcut without (a) and with (b) consideration for wildlife (from Hassinger et al. 1981).

Conserve Landscape Aesthetics

(Chiras, et al. 2002)

Conserve Landscape Aesthetics

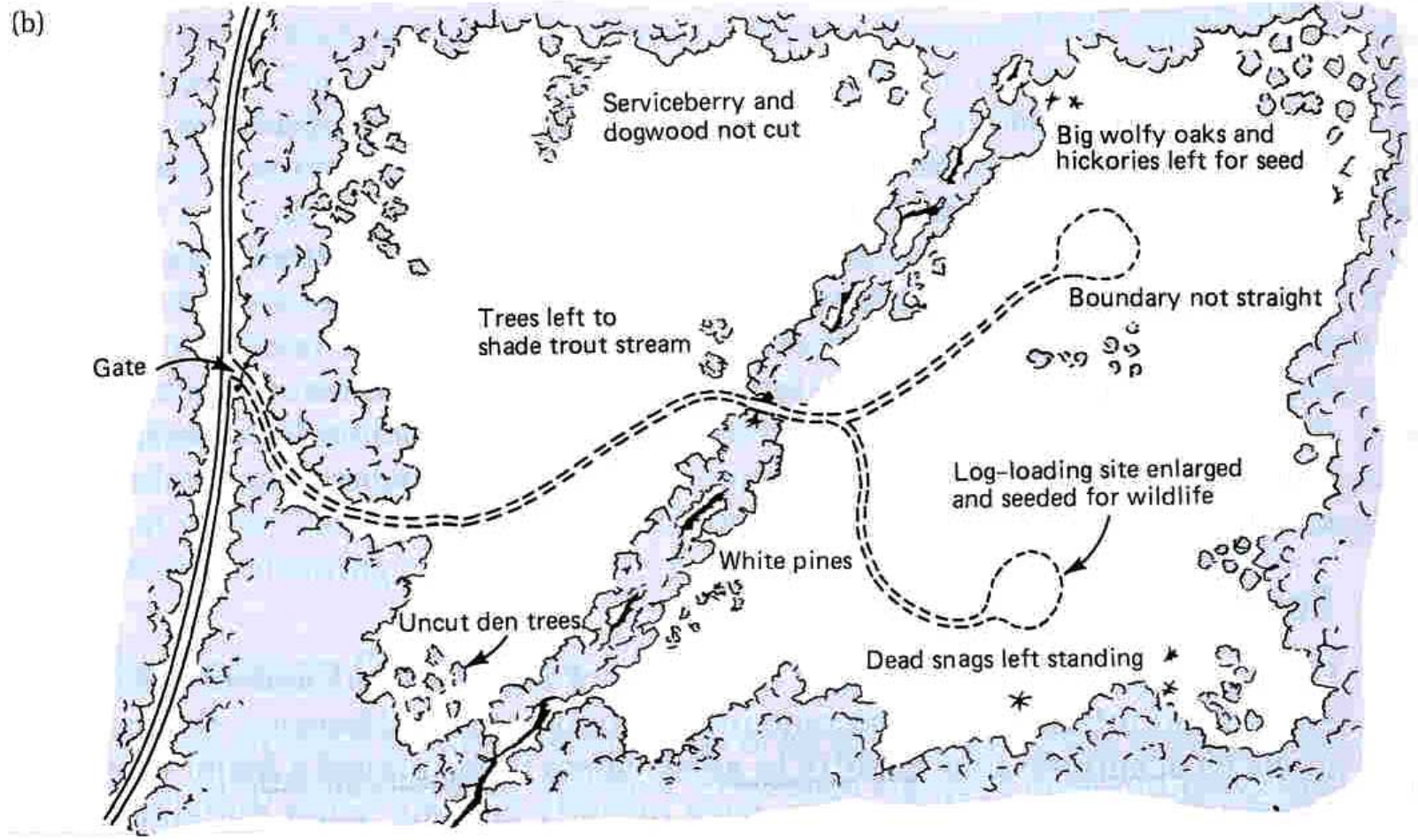


FIGURE 10.41 Clearcut without (a) and with (b) consideration for wildlife (from Hassinger et al. 1981).

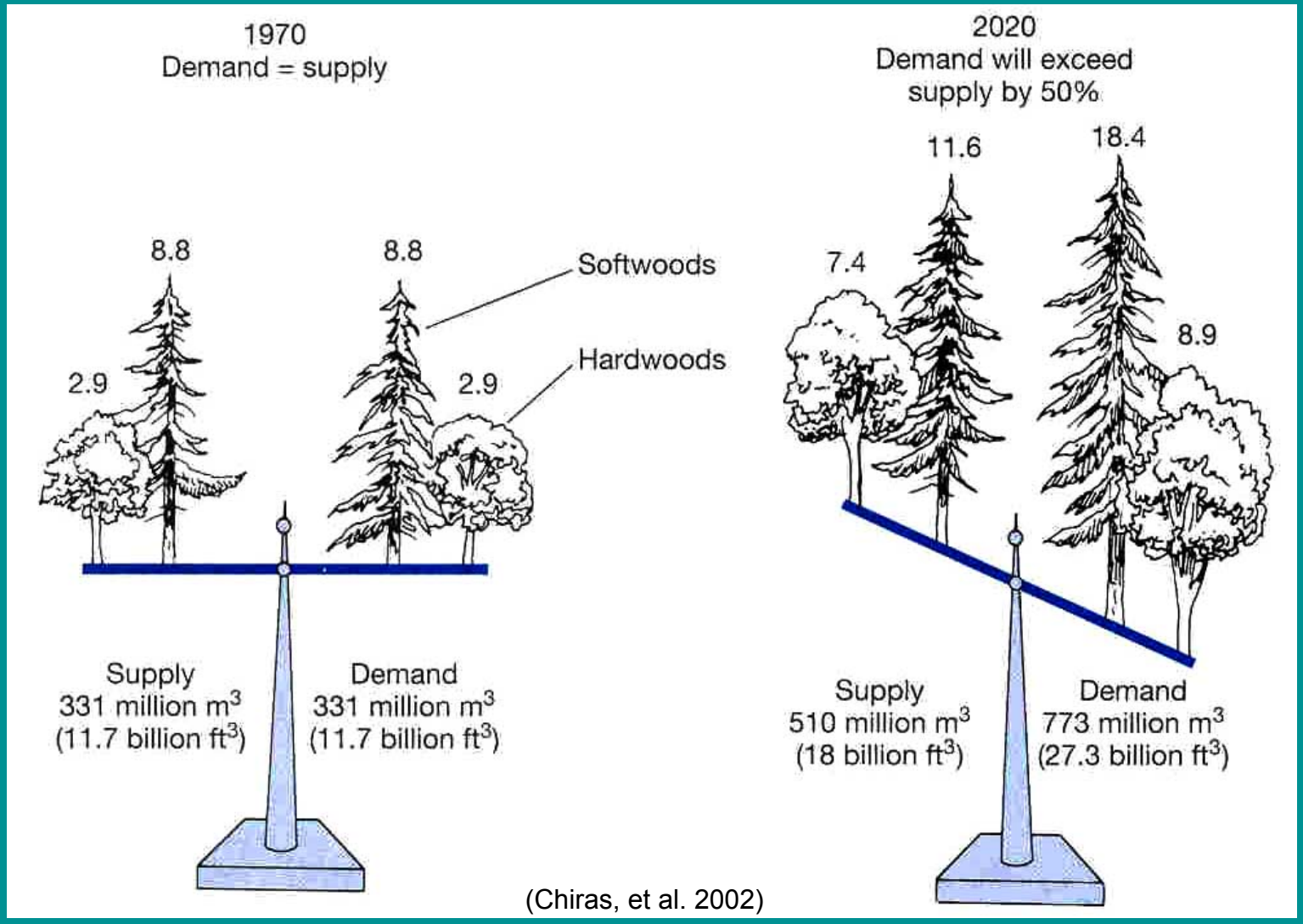
Conserve Landscape Aesthetics

SFM Principles & Practices

- Plan for the long-term, keep options open
- Interdependence of people and the environment
  - People derive cultural and spiritual values
  - People derive sense of self & place
  - People are increasing !

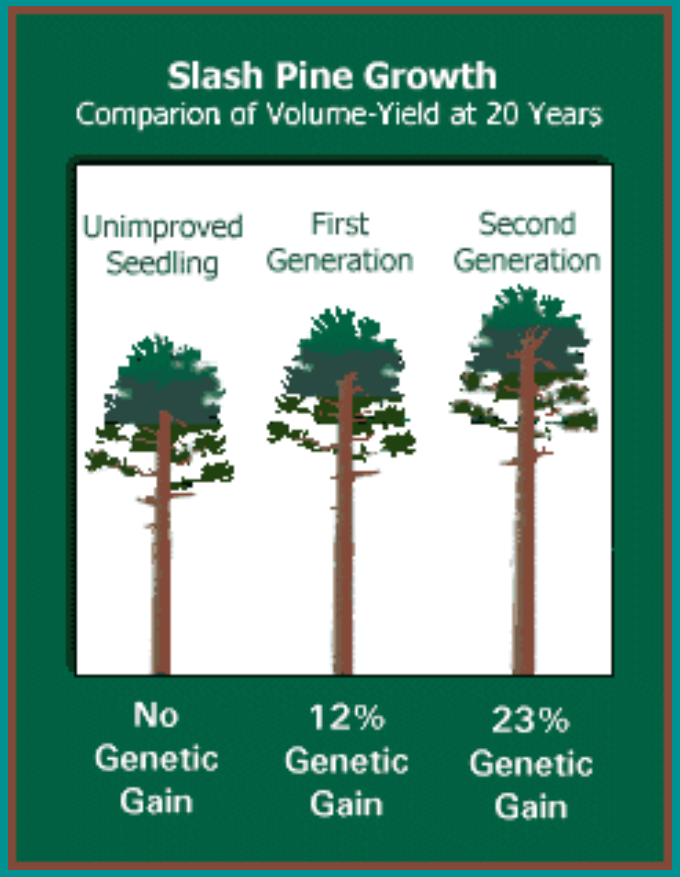
Interdependence

Increasing Population = Demand

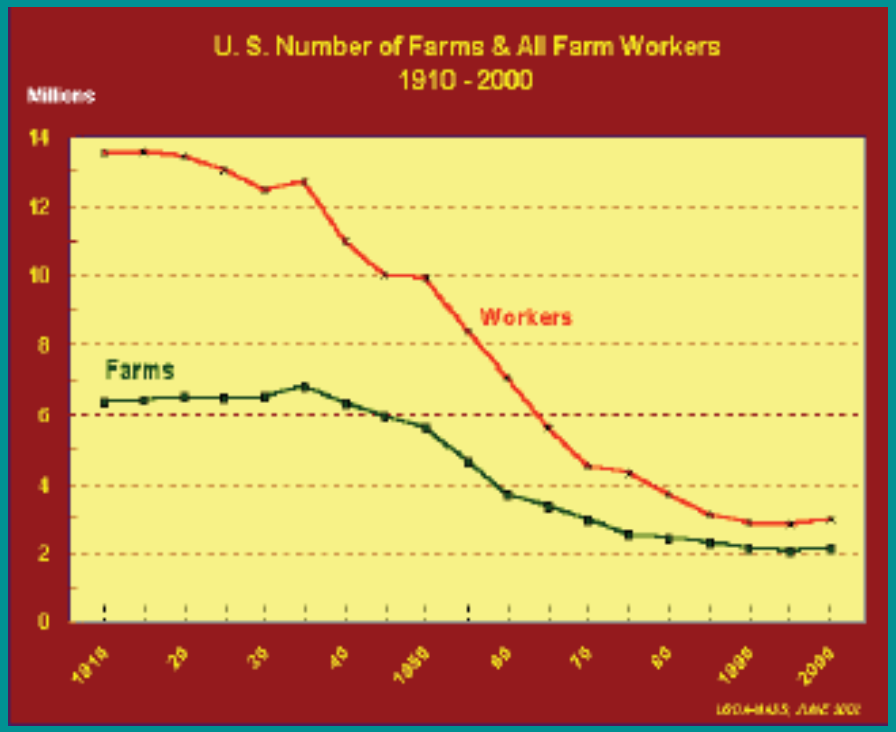


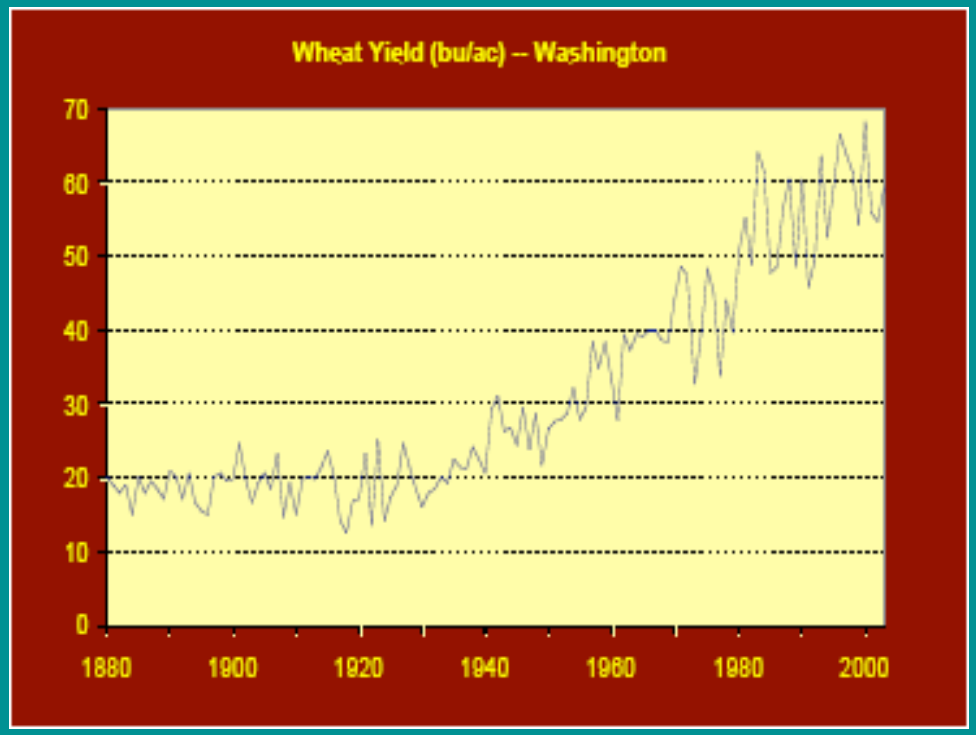
(Chiras, et al. 2002)

Increase Production



Increase Efficiency





Downsize It!

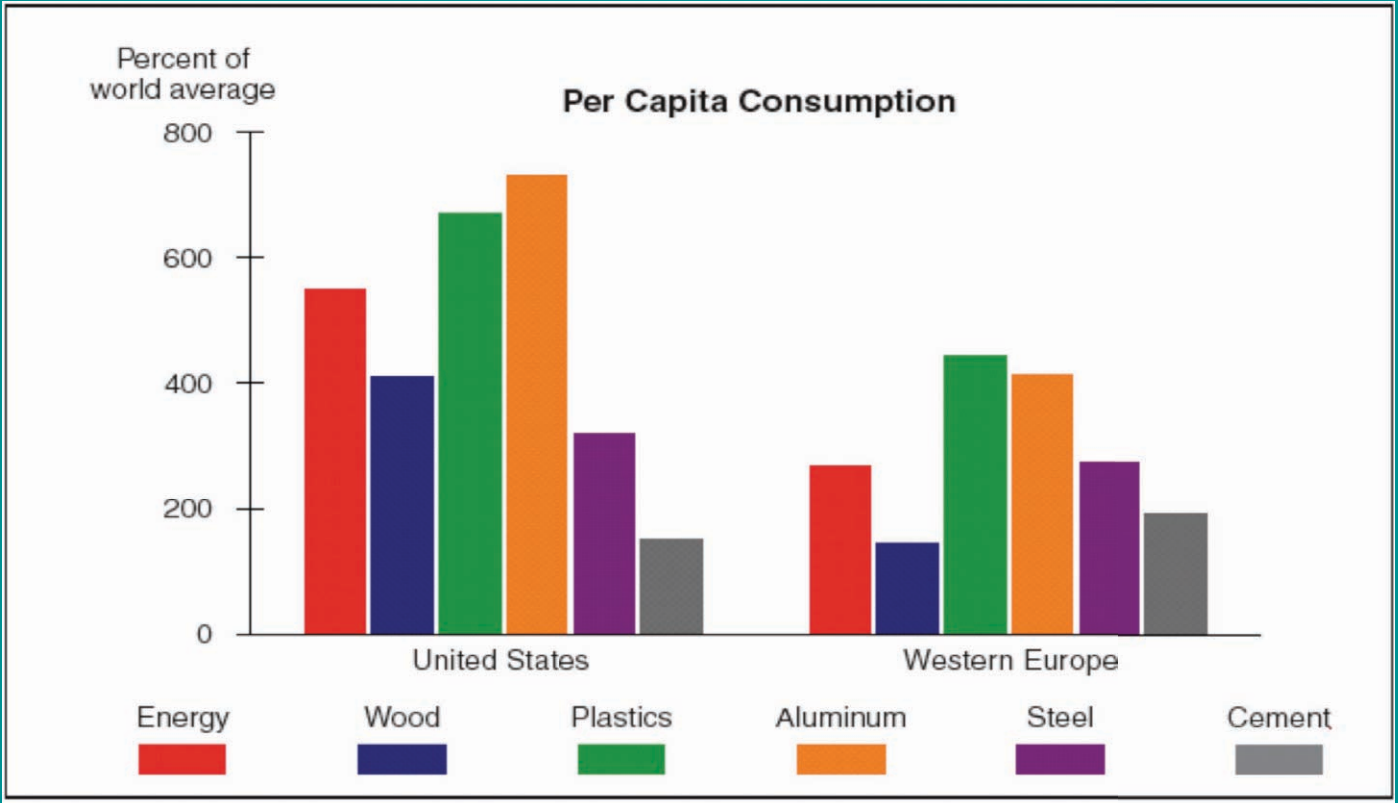


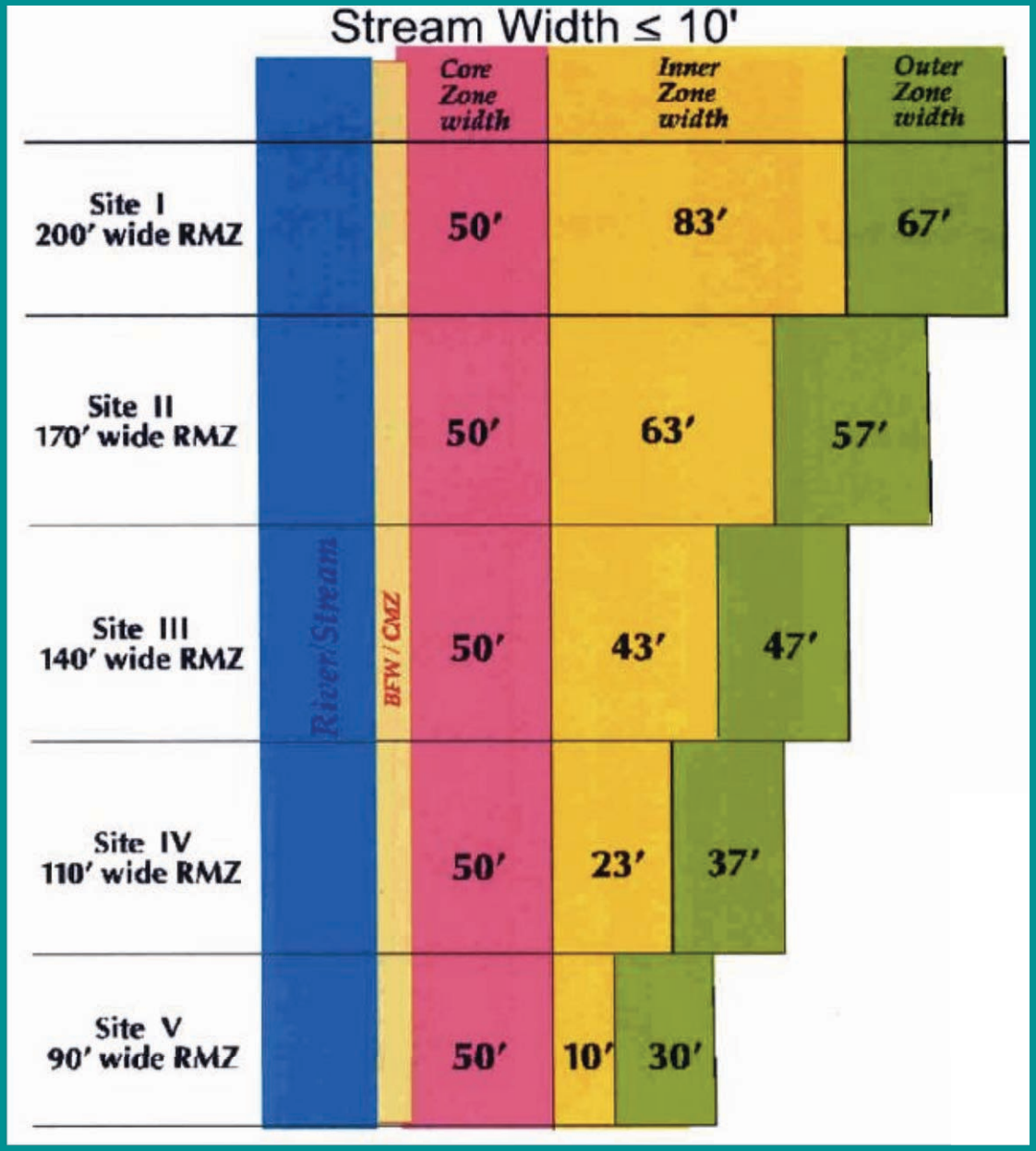
Figure 4. **The United States and western Europe are consuming disproportionate amounts of many resources. As other regions develop, a challenge will be to develop lifestyles that are equally as fulfilling but consume fewer resources, recognizing that even the availability of resources is changing (Simon 1996).** ***Sources:*** **Data provided by J. Bowyer, University of Minnesota, from FAO (2000), US Bureau of the Census, US Geological Survey, International Iron and Steel Institute, American Plastics Council, and European Aluminum Association.**

(in Oliver 2003)

SFM Practices

- Involve all people who have an interest in - or stand to be affected by - management outcomes
- Planning support of SFM should be a “transparent” process that requires and benefits from an informed, involved public

SFM Practices in Western WA



SFM Practices in WA

- Retention trees
  - Westside Wildlife trees
    - dead / dying / diseased trees
    - 3 per harvested acre
    - At least 10” DBH, 12’ height
  - Green recruitment trees
    - 2 per harvested acre
    - > 10” DBH, > 10’ height
- Other limits on harvest size, wetland zones, wildlife interactions, etc.

Concluding Thoughts

- Six key principles to Sustainability
  - Conservation
  - Recycling
  - Renewable resource use
  - Restoration
  - Population control & management
  - Adaptability
  - [Reconciliation]
- What's the greatest threat to forest sustainability?