

## **Multiple Use Defined (MUSY 1960)**

- The management of all the various resources so that they are utilized in combination that will best meet needs of people
- Areas large enough to make...periodic adjustments...to changing needs and conditions
- Some lands will be used for less than all resources
- Harmonious and coordinated management....without impairment of productivity of land
- Consideration given to relative values
- Not necessarily managing for...greatest dollar return or greatest unit output

## Economics View of Multiple Use

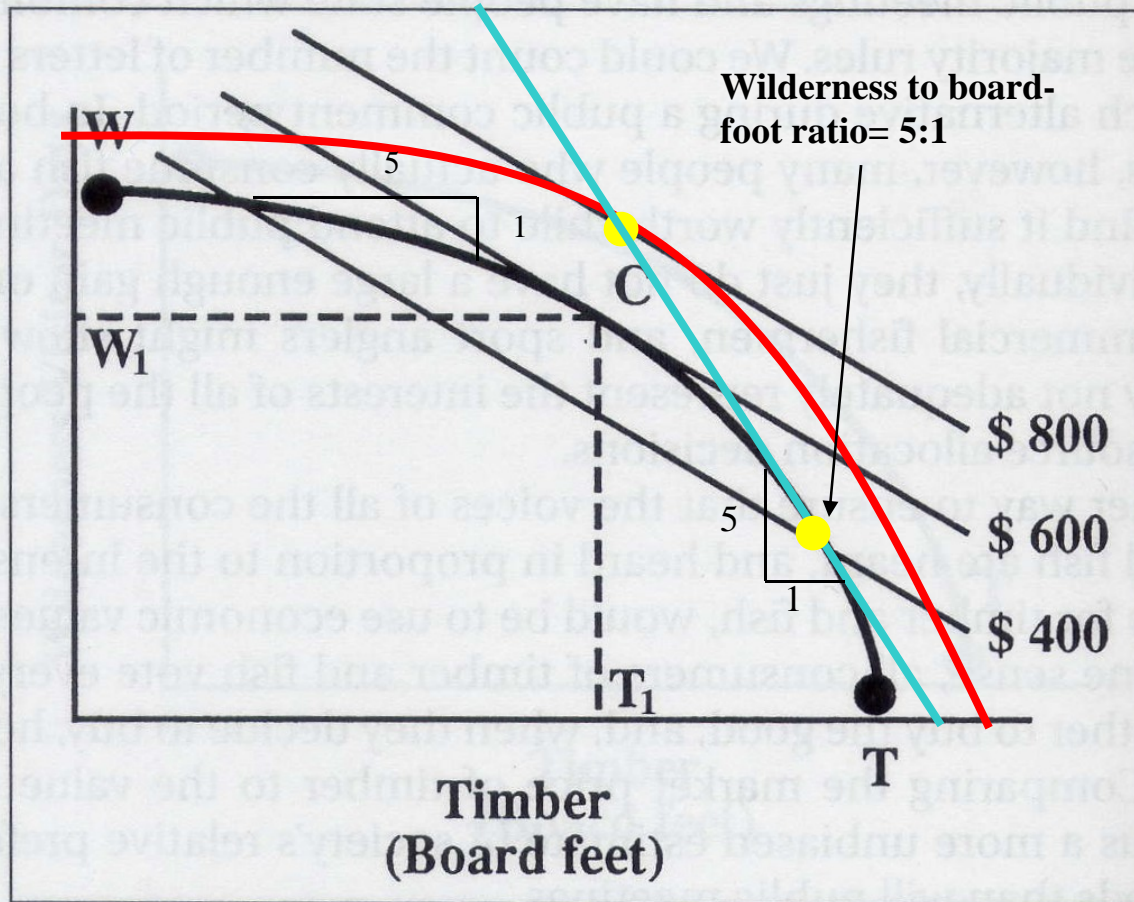
- Estimate commensurate values of both market and non-market outputs; select combo that maximizes total social value
- An “objective” criteria immune for interest group politics?
- What bundles of uses can be produced on a given piece of land?
  1. Not every piece of land has every use; but we also don't try for dominant use
  2. Particular mixture of uses depends on relationships between “output” production functions

## Multiple Use and “Production Functions”

- Outputs are what is produced; e.g.; timber, minerals, wilderness
- Inputs come from ecology, labor, capital
- Clawson says three elements are needed:
  - 1) Inventory of available and potential resources
  - 2) Production trade-offs; production possibilities curve
  - 3) Preference ratings/valuations
- Goal: Choose point on production possibilities frontier that maximizes social value

## Social Preference Functions

- How does society value the trade-off between different types of resources?
- Example: Fish are plentiful/housing boom; society values additional 1000 fish at \$40, and additional 1000 board feet of timber at \$200
- Ratio:  $200/40=5$ ; each board foot of timber is 5 times as valuable as each fish; people are willing to trade 5 fish for 1 board foot of timber
- Social value is maximized when slope of production function equals slope of social preference function
- Social preferences can change over time; so optimal point also changes
- Different types of equity or political constraints can also be modeled (see Linear Programming example in book)



**Figure 8.4:** Third Step in Multiple Use:  
Adding Preference Valuation Trade-offs to Determine Optimum Mix

## Measuring Social Values

- Economists have techniques for measuring market and non-market values
- Marketed commodities
  1. Demand estimation: comparison to other transactions;
  2. Residual valuation: Public lands value = market prices – production costs  
Example: Timber values for a timber sale determined by price paid for lumber minus milling/logging costs
  1. Change in net income: Public lands value = change in net income for adding more resources (e.g., AUMs)
- Non-market (public goods) valuation:
  1. Travel cost: Price paid to visit
  2. Contingent valuation: Ask people how much they would pay for different resources

## **Do We Need Politics(Loomis p.225)?**

“How would we identify preferences in the real world? We could hold public meetings and have people state with combination they like, and the majority rules. We could count the number of letters received in favor of each alternative during a public comment period. In both of these approaches, however, many people who actually consume fish and lumber might not find it sufficiently worthwhile to attend public meetings or write letters.”

“Comparing the market prices of timber to the value of fish will often give us a more unbiased estimate of society’s relative preferences for the two goods than will public meetings.”

## The Land Ethic

- Aldo Leopold, “A Sand County Almanac” (1949)
- 1909 grad of Yale School of Forestry, Forest Service Employee, early advocate of Wilderness in the Southwest (Gila National Forest, Aldo Leopold Wilderness)
- All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts. His instincts prompt him to compete for his place in that community, but his ethics prompt him also to cooperate (perhaps in order that there may be a place to compete for). The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land.



## Other Important Ideas

- Preservation: John Muir; parks, wilderness
- Conservation: Gifford Pinchot; wise-use
- Ecosystem management: Ecological science
- Collaborative management: Consensus, not conflict
- Sustainable development: Economic and environmental values have positive feedback
- Not an exhaustive list; just some recurring ideas