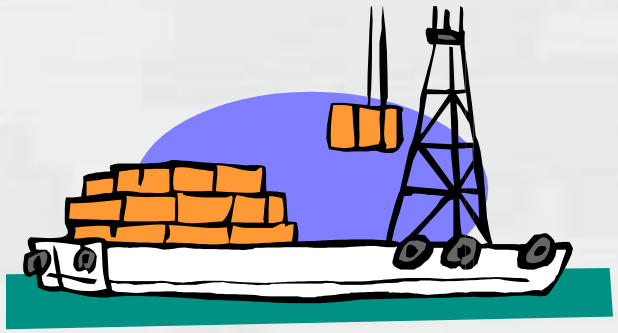
# Recreation - Value to the Nation

US Army Corps of Engineers
BUILDING STRONG®

# Value to the Nation

Navigation:

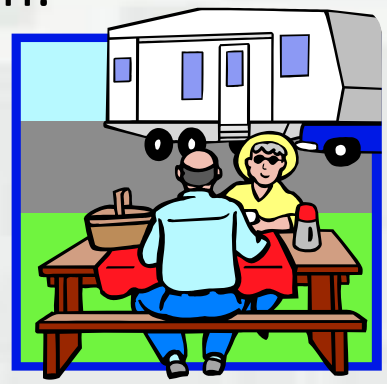


A barge load of goods:

NED benefits: Money saved in transportation costs compared to other alternatives

Regional economic impacts: Jobs and income generated in this region from transportation and related industries

Recreation:



A group of campers to a CE lake:

NED benefits: The amount of money campers would be willing to pay beyond what they actually have to

Regional economic impacts: Jobs and income generated in this region from visitor spending in recreation and related industries

# Value to the Nation
# NED VS RED

## Economic Efficiency – National Economic Development (NED)

- Net willingness to pay: What you would be willing to pay over and above actual expenditures (consumer surplus).

## Economic Impacts – Regional Economic Development (RED)

- Regional Economic Impact Analysis: actual flows of money into a region
- Actual Expenditure
- Convert to income – employment
- Transfer from one region to another

# Value to the Nation
# Regional Economic Development

Construction expenditures

Recreation visitation

# Value to the Nation
# Kaw Lake - Economic Impacts

## Economic Data in FY 2012*

155,102 visits per year resulted in:

- $5,032 (thousands) in visitor spending within 30 miles of the Corps lake.
- $2,624 (thousands) in sales within 30 miles of the Corps lake.
- Helps support 49 jobs within 30 miles of the Corps lake.
- $904 (thousands) in labor income within 30 miles of the Corps lake.
- $1,499 (thousands) in value added within 30 miles of the Corps lake.

With multiplier effects, visitor trip spending resulted in:

- $3,643 (thousands) in total sales.
- Helps support 59 jobs.
- $1,227 (thousands) in labor income.
- $2,109 (thousands) in value added (wages & salaries, payroll benefits, profits, rents, and indirect business

# Value to the Nation
# State of Oklahoma - Economic Impacts

## Economic Data in FY 2012*

19,730,483 visits per year resulted in:

- $621,645 (thousands) in visitor spending within 30 miles of Corps lakes.
- $325,770 (thousands) in sales within 30 miles of Corps lakes.
- 5,241 jobs within 30 miles of Corps lakes.
- $112,834 (thousands) in labor income within 30 miles of Corps lakes.
- $190,199 (thousands) in value added within 30 miles of Corps lakes.

With multiplier effects, visitor trip spending resulted in:

- $469,821 (thousands) in total sales.
- 6,521 jobs.
- $158,720 (thousands) in labor income.
- $277,001 (thousands) in value added (wages & salaries, payroll benefits, profits, rents, and indirect business taxes

# Value to the Nation
# Economic Impact Sources

Value to the Nation Website

http://www.corpsresults.us/recreation/recreation.cfm

Recreation Fast Facts

http://www.corpsresults.us/recreation/recfastfacts.cfm

Gateway Link

http://corpslakes.usace.army.mil/visitors/visitors.cfm

# Value to the Nation

## RED Effects

- ***Direct effects:*** the initial change of the new expenditure stream on industries in direct support of the new project. These 'direct' industries will require support.

- ***Indirect effects:*** changes in inter-industry transactions as supplying industries respond to new demands placed on them by 'direct' industries.

- ***Induced effects:*** changes in consumer spending patterns caused by increases in employment and income as 'direct' and 'indirect' industries increase their employment.

Indirect + Induced effects = Secondary Effects

# Regional Economics

Regional Economics concentrates on the integrated analysis of economic and social phenomena in a regional setting. It seeks to understand regional change, to anticipate change, and to plan future regional development. This study draws heavily on mathematical models.

*Several Types of Models can Estimate Regional Economic Impacts*

- Input-output (I-O) models,
- Social Accounting Matrix (SAM) models,
- Computable General Equilibrium (CGE) models,
- Econometric Models
- Economic Base Models

**Usual Suspects (Models)**

IMPLAN

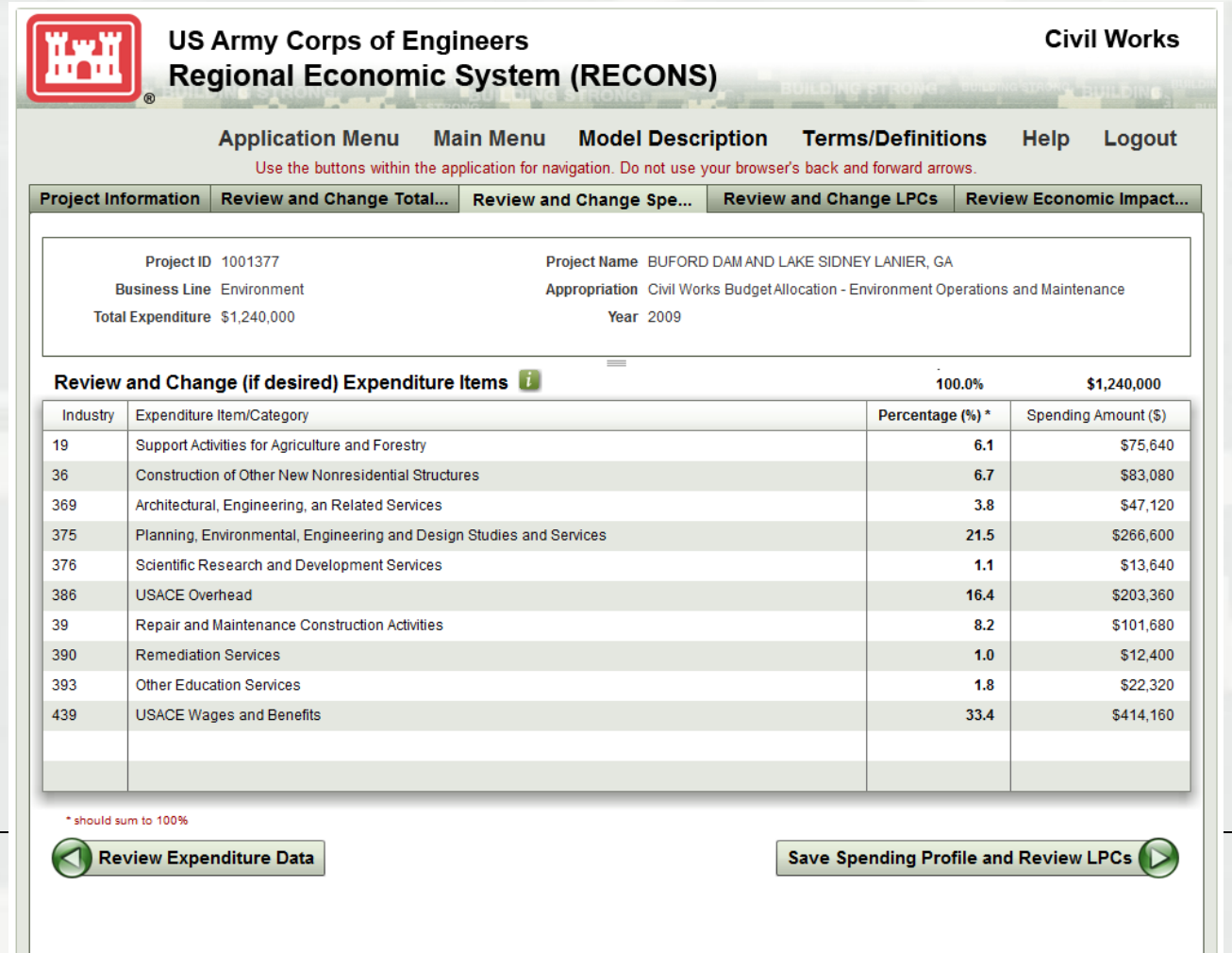
REMI

RIMS2

RECONS/REAS

# Value to the Nation – Spending Profiles

- http://el.erdc.usace.army.mil/elpubs/pdf/trel03-21.pdf



US Army Corps of Engineers
Regional Economic System (RECONS)

Civil Works

Application Menu | Main Menu | Model Description | Terms/Definitions | Help | Logout

Use the buttons within the application for navigation. Do not use your browser's back and forward arrows.

Project Information | Review and Change Total... | Review and Change Spe... | Review and Change LPCs | Review Economic Impact...

Project ID 1001377
Project Name BUFORD DAM AND LAKE SIDNEY LANIER, GA
Business Line Environment
Appropriation Civil Works Budget Allocation - Environment Operations and Maintenance
Total Expenditure $1,240,000
Year 2009

Review and Change (if desired) Expenditure Items

100.0% $1,240,000

| Industry | Expenditure Item/Category | Percentage (%) * | Spending Amount ($) |
|---|---|---|---|
| 19 | Support Activities for Agriculture and Forestry | 6.1 | $75,640 |
| 36 | Construction of Other New Nonresidential Structures | 6.7 | $83,080 |
| 369 | Architectural, Engineering, an Related Services | 3.8 | $47,120 |
| 375 | Planning, Environmental, Engineering and Design Studies and Services | 21.5 | $266,600 |
| 376 | Scientific Research and Development Services | 1.1 | $13,640 |
| 386 | USACE Overhead | 16.4 | $203,360 |
| 39 | Repair and Maintenance Construction Activities | 8.2 | $101,680 |
| 390 | Remediation Services | 1.0 | $12,400 |
| 393 | Other Education Services | 1.8 | $22,320 |
| 439 | USACE Wages and Benefits | 33.4 | $414,160 |

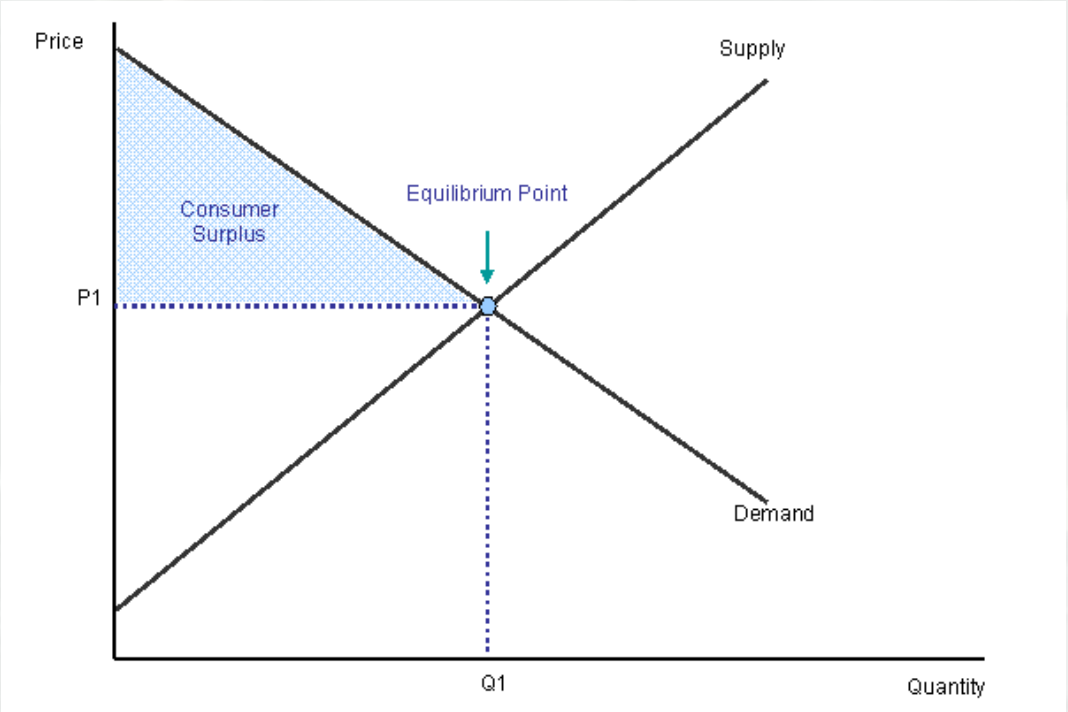
* should sum to 100%

Review Expenditure Data

Save Spending Profile and Review LPCs

# Consumer Surplus (NED)

Defined as willingness to pay net of direct costs or price paid by individual users (i.e., the difference between the amount that consumers actually pay and the amount that they would have been willing to pay).



# Travel Cost Method

- The basic premise of the travel cost method is that per capita use of a recreation site will decrease as out-of-pocket and time costs of traveling to the site increase, other variables being constant. TCM, consists of deriving a demand curve by using the variable costs of travel and the value of time as proxies for price. This method may be applied to a site-specific study or a regional model.

# Using the Variation in Travel Costs and Trips Taken to Trace Out a Demand Curve – Mt. Rainer

# Example: TC "Price" Calculations

**Assumptions:** 3 Persons (adults) per vehicle
Per capita curve based on one-way distance
Variable travel costs = $0.126/mile
Average wage rate = $ 12.00/hour
Average travel speed = 40 mph

**Variable TC:** Cost/mile/person = $.126/3 = $ 0.042
Cost/person/10 mile increment = $ 0.42

**Time Cost:** Time cost/hour = $12.00/3 = $ 4.00
Travel time/10 mile increment = .25 hour
Time cost/10 mile increment = $ 1.00

**Total Cost:** Travel & time cost/increment = $ 1.42
Round trip cost (x2) = $ 2.84

# Example Regional Travel Cost Model

Visits per capita = a + b1 (travel cost)
+ b2 (site quality)
+ b3 (substitutes)

# Travel Cost Method

**PROS:**

- Based on observation of use
- Intuitively sound
- Provides use estimate

**CONS:**

- Expensive
- Data extensive
- Need a variance of distance
- Multiple recreation destinations

# Contingent Valuation Method

The contingent valuation method estimates NED benefits by directly asking individual households their willingness to pay for changes in recreation opportunities at a given site. Individual values may be aggregated by summing willingness to pay for all users in the study area. This method maybe applied to a site-specific study or a regional model

**Sometimes Referred To As:**

- Bidding Game
- Direct Question Method
- Survey Method

# Assumptions of CVM

- Individuals can accurately assign a dollar value
- This “true value” can be correctly elicited

# Potential Sources of Bias

- General
  - Hypothetical
  - Strategic
- Instrument
  - Starting Point
  - Vehicle
  - Information
  - Interviewer

# Contingent Value Method

**PROS:**

- Can account for quality
- Flexible
- Can simulate a range of alternatives

**CONS**

- Requires OMB survey approval
- Expensive
- Technically challenging
- Questionable results

# Unit Day Value

# Unit Day Value Method

- The unit day value method relies on expert or informed opinion and judgment to estimate the average willingness to pay of recreation users. By applying a carefully thought-out and adjusted unit day value to estimated use, an approximation is obtained that may be used as an estimate of project recreation benefits.
- The product of the selected value times the difference in estimated annual use over the project life relative to the without- project condition provides the estimate of recreation benefits.

# Unit Day Value Criteria

## (How do we assign values?)

- Recreation Experience = quantity and quality of recreation activities
- Availability of Opportunities = availability of substitutes (higher value if there are fewer alternatives)
- Carrying Capacity = Capability of recreation area facilities to support the current quantity and density of use
- Accessibility = Access quality
- Environmental Quality = e.g. aesthetics

# Guidelines for Assigning Point: General Recreation

| Criteria | Judgment Factors: | | | | |
|---|---|---|---|---|---|
| **Recreation experience**<br>Total Points: 30<br>Point Value: | Two general activities<br>0 - 4 | Several general activities<br>5 - 10 | Several general activities: one high quality activity<br>11 - 16 | Several general activities: more than one high quality activity<br>17 - 23 | Numerous high quality activities: some general activities<br>24 - 30 |
| **Availability of opportunity**<br>Total Points: 18<br>Point Value: | Several within 1 hr. travel time: a few within 30 min.<br>0 - 3 | Several within 1 hr. travel time: none within 30 min.<br>4 - 6 | One of two within 1 hr. travel time: none within 45 min.<br>7 - 10 | None within 1 hr. travel time<br>11 - 14 | None within 2 hr. travel time<br>15 - 18 |
| **Carrying Capacity**<br>Total Points: 14<br>Point Value: | 0 - 2 | 3 - 5 | 6 - 8 | 9 -11 | 12 - 14 |
| **Accessibility**<br>Total Points: 18<br>Point Value: | 0 - 3 | 4 - 6 | 7 - 10 | 11 - 14 | 15 - 18 |
| **Environmental**<br>Total Points: 20<br>Point Value: | 0 - 2 | 3 - 6 | 7 - 10 | 11 - 15 | 16 - 20 |

# Table to Convert to Dollar Values FY 2009

| Point Values | General Recreation Values | General Fishing and Hunting Values | Specialized Fishing and Hunting Values | Specialized Recreation Values other than Fishing and Hunting |
|---|---|---|---|---|
| 0 | $3.58 | $5.15 | $25.09 | $14.56 |
| 10 | $4.26 | $5.83 | $25.76 | $15.46 |
| 20 | $4.70 | $6.27 | $26.21 | $16.58 |
| 30 | $5.38 | $6.95 | $26.88 | $17.92 |
| 40 | $6.72 | $7.62 | $27.56 | $19.04 |
| 50 | $7.62 | $8.29 | $30.25 | $21.51 |
| 60 | $8.29 | $9.19 | $32.93 | $23.75 |
| 70 | $8.74 | $9.63 | $34.95 | $28.68 |
| 80 | $9.63 | $10.31 | $37.64 | $33.38 |
| 90 | $10.31 | $10.53 | $40.33 | $38.09 |
| 100 | $10.75 | $10.75 | $42.57 | $42.57 |

# Unit Day Value Method

**PROS:**

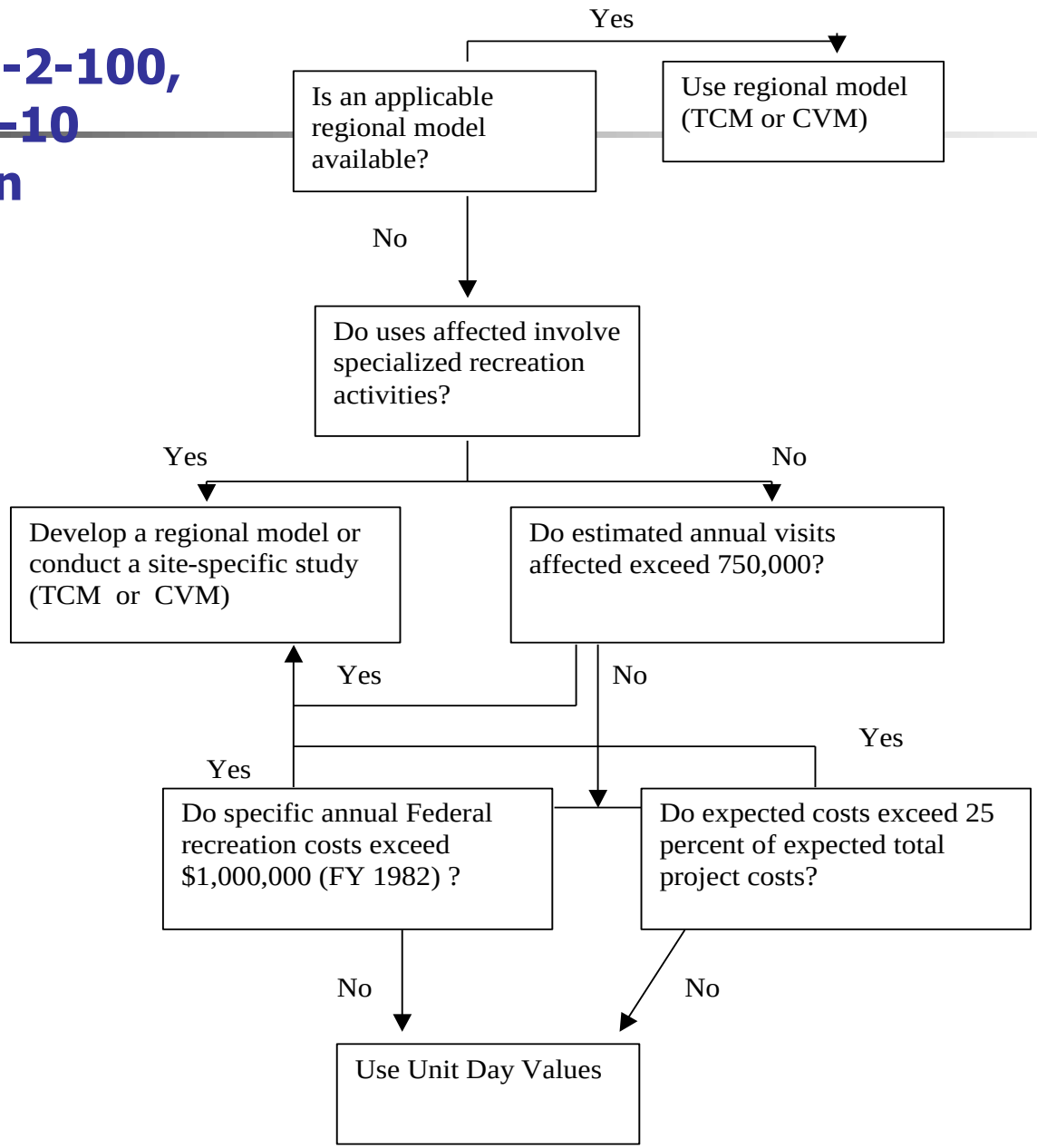
- Inexpensive
- Relatively easy
- Understandable
- Can account for quality

**CONS:**

- Not site specific
- Relies on expert or informed opinion
- Limited use by regulation

# Method Selection Criteria

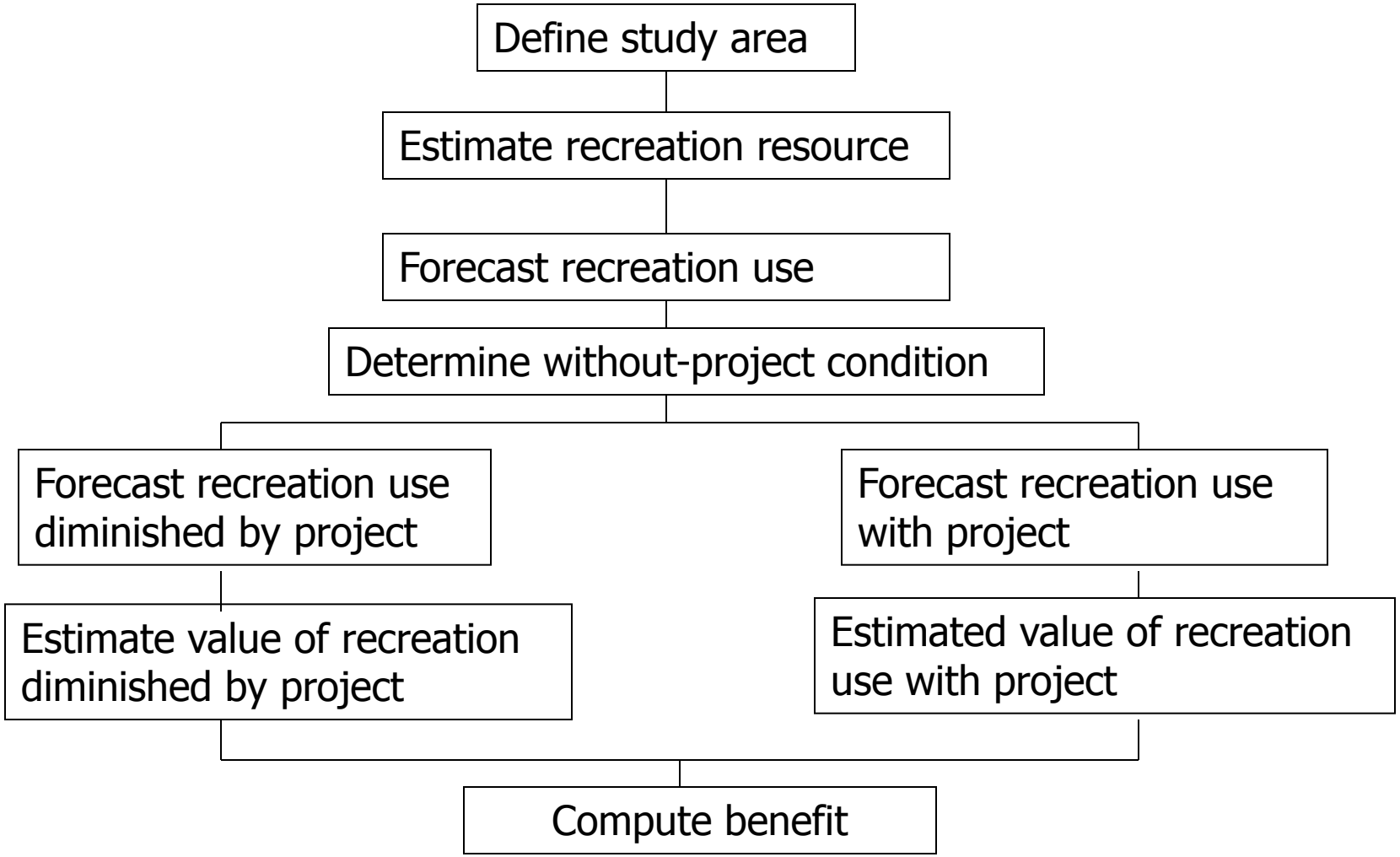
**ER 1105-2-100, Figure E-10 Selection Criteria**



# Criteria for evaluation

- Based on an empirical estimate of demand applied to the particular project.
- Reflects the socioeconomic characteristics of market area populations, qualitative characteristics of the recreation resources under study, and characteristics of alternative existing recreation opportunities.
- Accounts for the value of losses or gains to existing sites in the study area affected by the project (without-project condition).
- Willingness to pay projections over time are based on protected changes in underlying determinants of demand.

# Recreation Benefit Evaluation Procedures



# General Measurement Standard

**Willingness of users to pay for each increment of output from a plan.**

- **Measurement Techniques**
  - Actual or simulated prices
  - Changes in net income
  - Cost of most likely alternative
  - Administratively established values

# Demand

- Maximum quantities an individual is willing to buy for various prices of a good or service of a given quality.

- Maximum prices an individual is willing to pay for various quantities of goods or services of a given quality.

# Supply and Use

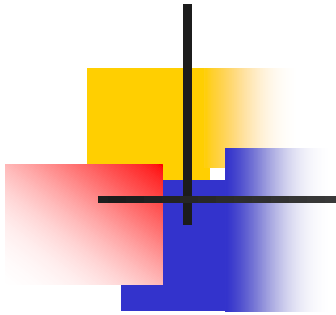
## Supply:

Maximum quantities available at various prices of a good or service of given quality.

## Use:

Quantity of a good or service actually consumed by all individuals at existing price(s)

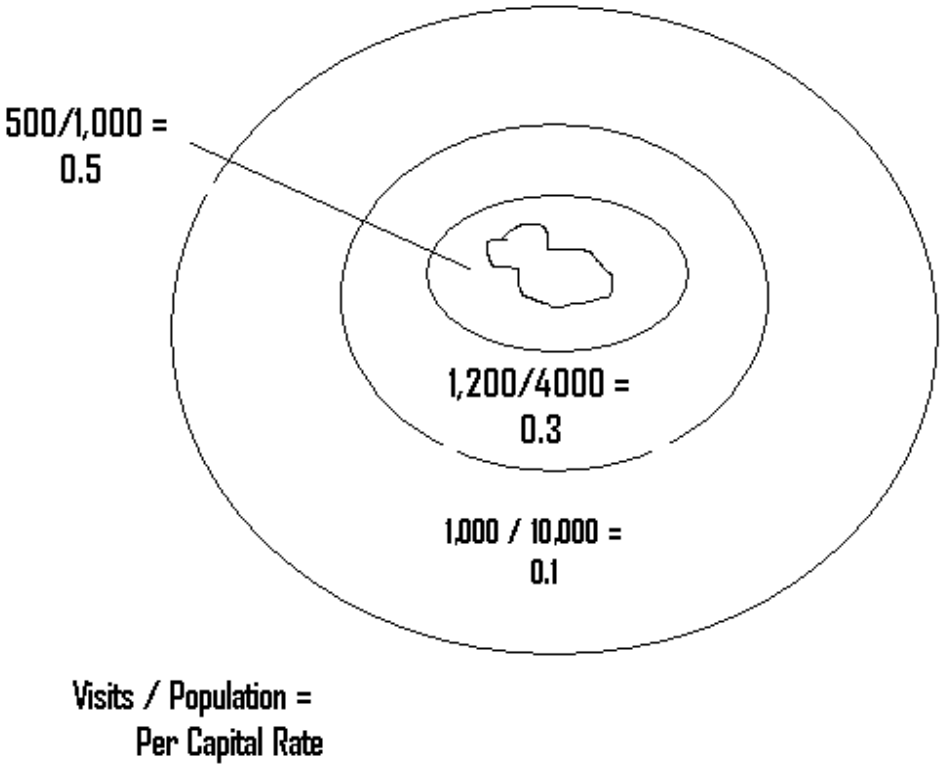
Supply-Demand Equilibrium.



# Example Simple Travel Cost Model:

Visits Per Capita = a + b (Travel Cost)

# Similar Project Approach Using Concentric Distance Zones As Origins



# Non-lake Recreation

- Appendix E,  ER 1105-2-100 Contains the list of approved recreation facilities (generally not vendible)
- More than 10 % of costs need prior ASA approval (non-lake)
- On project lands not purchased for recreation (exception is parking lots or facilities for health and safety)
- For ecosystem restoration the facilities must be compatible to the project outputs (enhance the visitation experience by taking advantage of natural values)
- Local sponsor to cost share 50-50, and O&M