

Economics 33530: Assignment 2 Key
(Due Friday, October 5)

Professor Jensen

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Suppose the travel cost demand curve for recreation (e.g., boating, water-skiing, wind-surfing, fishing) on Lake Looney is

$$MPB = 180 - 5Q,$$

where MPB is the “revealed travel cost” and Q is the number of trips per year. The county government is considering a clean-up program that will increase the travel cost demand for recreation on Lake Looney to

$$MPB_{\text{new}} = 280 - 5Q.$$

Assume the average travel cost paid by someone visiting the lake is \$100.

1. **(40 points)** If the cost of this program is \$5,000, should the government undertake it? Explain why or why not?

Before clean-up, the number of trips is given by $MPB = 180 - 5Q = 100$, or $Q = 16$, so total social benefit (TSB, the area below the MPB function between $Q=0$ and $Q=16$) $= (1/2)(16)(180-100) + (16)(100) = 640 + 1600 = \2240 .

We are only given average travel cost, not MSC, so the best we can do is estimate total social cost (TSC) using this average cost and the number of trips, or $TSC = (100)(16) = \$1600$.

Therefore net social benefit is $NSB = TSB - TSC = 2240 - 1600 = \640 .

After clean-up, the number of trips is given by $MPB_{\text{new}} = 280 - 5Q = 100$, or $Q = 36$, so $NSB = (1/2)(36)(280-100) + (36)(100) - (36)(100) = \3240 .

The increase in NSB resulting from the clean-up is $3240 - 640 = \$2600$.

Obviously this clean-up is not a good idea if its cost is \$5000 because the gain to society, measured in revealed preference for recreation, is only \$2600. That is, recreational users of the lake would not be willing to pay for this clean-up. However, if there are passive uses of Lake Looney that society values at \$2400 or more, then the clean-up would be more defensible. Here is a case where stated-preference values (such as contingent valuation) could make a difference in policy.

2. **(20 points)** If the cost of this program is \$2,000, should the government undertake it? Explain why or why not?

Now it seems straightforward that the clean-up is a reasonable policy, because the evidence shows that users of the lake would be willing to pay more than \$2000 to clean up the lake.

3. **(10 points)** What is the lowest clean-up cost at which this program is feasible? Explain your answer.

This is pretty boring. Obviously the lowest cost is 0. A more interesting issue is the highest cost at which clean-up would be defensible. This is the NSB gain of \$2600 – or is it? It might be much higher if passive-use values were taken into account in valuing the benefits of the clean-up.

4. **(30 points)** How would you finance the clean-up program, keeping in mind that you must balance the budget (i.e., find a source of revenue to pay the cost)? Explain why you chose this method.

One approach is a users' fee – each recreational user must pay a fee each time they come to the lake (an interesting question is what this tax should be). Another approach is for the county government to tax its residents. The user fee has the advantage that only those who benefit directly from recreation at the lake pay for the clean-up. However, if there are substantial passive-use benefits, such as existence value or benefits from ecosystem services provided by the lake, then a county-wide tax is more defensible. In this latter case, however, because passive-use benefits can be gained by people living outside the county, it is unlikely the residents of the county will pay to clean up the lake to the extent that all concerned parties would prefer. Indeed, they should not be expected to pay for more than they gain.