

Memorandum To: Scott Knoche, National Pollution Funds Center

From: Eric English, NOAA, Office of Response and Restoration

Subject: Valuation of lost and substitute trips for the *Athos I* assessment

Date: 19 March 2007

This memo is written in support of analysis presented in the Draft Athos/Delaware River Lost Use Valuation Report. It describes the justification for applying the same per-trip value to two types of behavioral response among anglers impacted by the Delaware River oil spill. In accordance with the language in the report, the term “substitute trips” will refer to trips that would have been taken to the spill-impact area in the absence of the spill, but were instead taken to an alternative location on the Delaware River. The term “lost trips” will refer to a decline in the number of trips taken to the Delaware River, representing the decision by an angler to engage in activities other than Delaware River fishing.

The sections below address this issue from the perspective of economic theory and economic practice as follows: 1) Economic theory provides no indication that lost trips should be associated with either a greater or smaller loss of consumer surplus than substitute trips; and 2) Values for a recreational trip commonly reported in the literature represent a combination of these two types of behavioral response and are typically applied to both lost and substitute trips without distinguishing between them.

Economic Theory

The first issue is addressed by considering an angler who because of the spill takes fewer trips to the spill-impact area than he would have taken under baseline conditions. For each trip not taken to the spill-impact area, his options are A) take a fishing trip to a location on the Delaware River outside the spill-impact area, or B) use the time he would have spent fishing on the Delaware River to engage in alternative activities. Option A corresponds to a substitute trip and option B corresponds to a lost trip. Both of these options involve a decline in value compared to taking a trip to the Delaware River under baseline conditions, since both options are available but are not chosen under baseline conditions. When the observed choice is a substitute trip, option B must involve a greater loss than option A. When the observed choice is to engage in alternative activities, option A must involve a greater loss than option B. Clearly, on any given occasion, a substitute trip may represent a greater loss in value or a smaller loss in value than a lost trip. No guidance is available from economic theory to draw any general conclusions about which type of behavioral response entails a greater loss in value when averaged over observed choices.

Note that it would not be correct to suggest that a substitute trip must mitigate an angler's consumer surplus loss compared to a lost trip, because if this were the case all anglers would choose to take substitute trips rather than to engage in alternative activities. Likewise, for an individual who chooses to engage in alternative activities, the consumer surplus from a substitute trip is undefined (loosely speaking, it is negative). Therefore it cannot be subtracted from the consumer surplus loss associated with a lost trip in order to partly offset the lost value.

Economic Practice

Substitute trips and lost trips are distinguished in the recreation surveys undertaken for the Athos lost use assessment. This distinction arises from the angler-interview format and the need to obtain during interviews a complete understanding of behavioral changes potentially experienced by anglers. The distinction is often ignored in the literature because absent the use of an assessment survey the distinction is unnecessary. It is common practice in the literature to apply the same value to trips resulting from both types of behavioral response.

A useful example is provided by a U.S. Department of Agriculture study of benefit transfer (Rosenberger and Loomis 2003) that is referenced in the Athos lost use report. On page 7 of the study, equation (1) demonstrates the application of benefit transfer. Specifically, a value per trip is obtained from the literature by dividing the total consumer surplus change resulting from an impact to a recreation site by the change in recreation trips at the site resulting from the impact. This value per trip is then multiplied by the change in recreation trips at the site being evaluated. The change in trips both at the literature site and at the evaluated site are defined in equation (1) without any distinction between lost and substitute trips. Note that the example in Rosenberger and Loomis describes a resource improvement, where the analogue to lost and substitute trips would be additional trips drawn from alternative activities and alternative sites, respectively. One need only reverse the calculation and remove the improvement to represent the evaluation of impacts to a degraded resource. In either case, the example in Rosenberger and Loomis indicates that the same per-trip value should be applied to all trips that comprise a change in use at an impacted site without regard to the type of activity exchanged with the affected trips.