

necessary to properly perform such a study. Thus, EPA's analysis of nonuse benefits of the section 316(b) regulation relies on benefits transfer. As noted above, however, stated preference methods have several limitations that must be considered when conducting benefits transfer. EPA recognizes that benefits transfer of stated preference-based WTP estimates to a policy context that differs from the study context can be problematic, given the significant influence of context on stated-preference values. EPA is still considering whether the underlying studies in the current analysis are close enough to the policy context to warrant benefits transfer and requests comment on this issue.

For the proposed rule analysis, EPA used a "50 percent" rule to estimate nonuse benefits from reducing impingement and entrainment losses (see the proposed rule Case Study Analysis for detail, available at <http://www.epa.gov/waterscience/316b/>). The Agency received numerous comments on this approach. Specifically, commenters argued that the "50 percent rule" is outdated and that EPA needs to revise this approach based on more recent studies of use and nonuse benefits associated with environmental quality improvements.

In response to public comments, EPA has developed a revised analysis of nonuse benefits and is requesting comment in the NODA on this revised methodology. First, the Agency developed a benefit transfer approach that combines an estimate of the amount of habitat required to offset impingement and entrainment losses (including forage species and the unlanded portion of commercial and recreational species) by means of wild fish production with a benefits transfer estimate of WTP for aquatic habitat preservation/restoration. The following section briefly summarizes this approach. Second, EPA reviewed available evidence concerning total benefits (including use and nonuse values) from the surface water valuation studies that are potentially applicable to the section 316(b) regulation. Section E.2 below discusses EPA's review of these studies and outlines further steps in analyzing nonuse and use benefits from available economic literature.

1. Benefit Transfer Approach

The methodology used in this analysis uses values that survey respondents indicated for preservation/restoration of eelgrass (submerged aquatic vegetation, SAV), and wetlands to evaluate losses of fishery resources. Because one of the results of aquatic

habitat preservation/restoration is increased production of fish and shellfish, it may be appropriate to use valuation of habitat restoration as a proxy for the value of the fish and shellfish lost due to impingement and entrainment. The method used by EPA in this NODA for such indirect valuation first assesses respondents' values for habitats that play a significant role in the production of fish or shellfish, and then estimates the quantity of such habitat required to replace fish and shellfish lost to impingement and entrainment. These data are then combined to yield an indirect estimate of household values for fish and shellfish. Survey respondents were asked to value acres of habitat (e.g., eelgrass or wetlands) without knowing the exact quantities of each species produced by the habitat. These values per acre were then translated, using estimates of fish abundance in these habitats, into values for specific species and quantities of fish or shellfish. The habitat valuation study used in this analysis specifically described eelgrass as "habitat for fish and shellfish." The authors of this study concluded, based on comments made by participants in focus groups, that the survey population was familiar with both eelgrass and wetlands, and that they associated both of these habitats with production of and habitat for fish and shellfish. Another study (Johnston *et al.*, 2002) found that ecological improvements to statewide fish and shellfish populations were among the attributes that affected respondents' relative valuation of various wetlands restoration projects. This suggests that respondents in the habitat valuation study were aware of the fish production "services" provided by SAV (eelgrass), and may have been aware of the fish production "services" provided by wetlands.

EPA's approach to estimating values for fish and shellfish habitats needed to offset impingement and entrainment losses of fish involves three general steps:

- Estimate the amount of wetland and eelgrass habitat needed to produce organisms to the level necessary to offset impingement and entrainment losses for the subset of species for which production information is available;
- Develop willingness to pay (WTP) values for the fish production services of the relevant habitat types; and
- Estimate the value of impingement and entrainment losses, based on values for the restored habitat required to offset impingement and entrainment losses, by multiplying the WTP values for the fish and shellfish production services per

acre of restored eelgrass and wetland habitat by the required number of restored acres of each habitat type.

The Agency solicits comments on whether this approach provides a more comprehensive value that addresses all impingement and entrainment losses.

The following NODA sections briefly summarize this benefits transfer approach and its application to estimating the value of the fish habitat required to offset impingement and entrainment losses in the North Atlantic Region. Additional detail on the methods and data EPA will use throughout this analysis are provided in "Estimating Total and Nonuse Values for Fish, Based on Habitat Values for Coastal Wetlands and Eelgrass" (DCN 5-1010) that accompanies this NODA.

a. Estimating the Amount of Different Habitat Types Needed To Offset Impingement and Entrainment Losses for Specific Species

The first step in the analysis involves calculating the area of SAV or wetland habitat needed to offset impingement and entrainment losses, for the subset of species for which restoration of these habitats was identified by local experts as the preferred restoration alternative, and for which production information is available; *i.e.*, the habitat that will produce the equivalent quantity of fish impinged and entrained. Details on this analysis are provided in Estimating Total and Nonuse Values for Fish, Based on Habitat Values for Coastal Wetlands and Eelgrass, DCN 5-1010, that accompanies this NODA.

Table X-33 presents lower and upper bound estimates of the total wetland and SAV restoration required to offset North Atlantic impingement and entrainment. These estimates reflect the acreage needed for the species requiring the maximum quantity of habitat restoration to offset its impingement and entrainment losses. The amount of tidal wetland restoration in the North Atlantic region is based on the acreage required for winter flounder. The lower bound estimate is winter flounder restoration estimate derived for Brayton Point and the upper bound estimate is the estimate for Pilgrim. The lower bound estimate for regional SAV restoration is based on the acreage needed for northern pipefish at Pilgrim and the upper bound estimate is based on the acreage needed for scup at Brayton Point.