

and nonuse values. However, EPA was able to estimate nonuse values for the North Atlantic region only due to data limitations. "Nonuse values, like use values, have their basis in theory of individual preferences and the measurement of welfare changes. According to theory, use values and nonuse values are additive" (M. Freeman, 1993). The following sections present the estimated monetary value of impingement and entrainment losses under the baseline scenario and the estimated impingement and entrainment reduction benefits under the preferred option for the two study regions. The Agency, however, points out the estimate of benefits for the Northern California region is incomplete

and includes recreational and commercial fishing benefits only.

1. Benefit-Cost Analysis of the Preferred Option for the North Atlantic Region

a. Total Monetary Value of Baseline Impingement and Entrainment Losses in the North Atlantic Region

Table X-44 presents EPA's estimates of the total value of baseline impingement and entrainment losses at cooling water intake structures in the North Atlantic region. The estimated nonuse value of fishery resources lost to impingement and entrainment ranges from \$75.64 million to \$139.92 million per year (2002\$). Note that EPA has provided two different estimates of total

value in Table X-44. The first total value is the sum of aggregate use value and the nonuse component of restoration-based value. The second total value (*i.e.*, restoration-based total value) is simply the total value (including nonuse) for SAV and wetland restoration acres as presented in Section X E d of this preamble. The estimated total value of impingement and entrainment losses in the North Atlantic region ranges from \$79 to \$143 million (2002\$) per year when commercial/recreational use values are added to the nonuse component of restoration-based values. The total value based on the total restoration-based value is similar in range (\$79 to \$148 million).

TABLE X-44.—ANNUAL VALUE OF BASELINE LOSSES FROM IMPINGEMENT AND ENTRAINMENT IN THE NORTH ATLANTIC REGION (MILLIONS 2002\$)

| | Before discounting | | Discounted using 3% discount rate | | Discounted using 7% discount rate | |
|---|--------------------|--------|-----------------------------------|--------|-----------------------------------|--------|
| | Low | High | Low | High | Low | High |
| Use Value of Resources Lost | | | | | | |
| Commercial Use ^{a,b} | \$0.28 | \$0.28 | \$0.24 | \$0.24 | \$0.20 | \$0.20 |
| Recreational Use ^{a,b} | 3.07 | 3.07 | 2.64 | 2.64 | 2.25 | 2.25 |
| Aggregate Use Benefits | 3.36 | 3.36 | 2.88 | 2.88 | 2.45 | 2.45 |
| Nonuse Value of Resources Lost ^c | | | | | | |
| Restoration-based nonuse value | 75.64 | 139.92 | 75.64 | 139.92 | 75.64 | 139.92 |
| Total Monetary Value of Resources Lost | | | | | | |
| Total value (aggregate use + restoration-based non-use) | 79.00 | 143.28 | 78.52 | 142.80 | 78.09 | 142.37 |
| Restoration-based total value ^d | 79.21 | 148.25 | 79.21 | 148.25 | 79.21 | 148.25 |

Note: Sum of components may not equal totals due to rounding.

^a Welfare losses represent losses due to both impingement and entrainment because recreational estimates cannot be presented separately for these categories. Commercial/recreational use values are annual values derived in Section X C.

^b Commercial and recreational losses are presented undiscounted, and discounted at 3% and 7%. There are no low or high estimates for welfare losses.

^c Nonuse values are not discounted. Values are based on nonuse values for SAV and wetland restoration for the populations in counties abutting affected water bodies. Low values assume lower bound restoration acreage and high values assume upper bound restoration acreage amounts (see Section X E d of this preamble).

^d Total monetary value based on total values associated with restoration is not discounted (see Section E.2 for detail).

b. Estimated Benefits and Costs of the Preferred Option

Table X-45 presents the total annual costs of the preferred regulatory option

for the North Atlantic region. The estimated pre-tax cost for facilities located on estuaries or tidal rivers is \$17.58 million and, for ocean-located

facilities, \$0.57 million. The total annual cost is \$18.15 million.

TABLE X-44.—TOTAL ANNUAL COSTS FOR THE NORTH ATLANTIC REGION (PRE-TAX) AS OF 2005 (IN 2002\$, MILLIONS)

| | Estuary/Tidal/ Total River | Ocean | Total |
|----------------------|-------------------------------|--------|---------|
| North Atlantic | \$17.58 | \$0.57 | \$18.15 |

Table X-46 presents EPA's estimates of the total benefits from impingement and entrainment reduction in the North Atlantic region under the preferred option. The estimated impingement and

entrainment reduction benefits under the preferred option range from \$14.84 to \$28.57 million per year (2002\$).

Combining the estimated cost and benefit values, the estimated net

benefits of installing the preferred option range from negative \$3.31 million to positive \$10.42 million (2002\$).