

# Chapter E7: Conclusions

The results of EPA's evaluation of I&E of striped bass and special status fish species at the Pittsburg and Contra Costa facilities demonstrate the significant economic benefits that can be achieved if losses of highly valued species are reduced by the proposed § 316(b) rule. The benefits were estimated by reference to other programs already in place to protect and restore the declining striped bass population and threatened and endangered fish species of the San Francisco Bay/Delta region.

Based on limited facility data, EPA estimates that the striped bass recreational catch is reduced by about 165,429 fish per year due to impingement at the two facilities and 185,073 fish per year due to entrainment. As indicated in Chapter E4, estimated impingement losses of striped bass are valued at between \$372,000 and \$577,000 per year, and estimated entrainment losses are valued at between \$2.53 million to \$3.93 million per year (all in \$2000).

EPA estimates that the total loss of special status fish species at the two facilities is 145,003 age 1 equivalents per year resulting from impingement and 269,334 age 1 equivalents per year due to entrainment. Estimated impingement losses of these species are valued at between \$12.14 million and \$41.81 million per year, and estimated entrainment losses are valued at between \$22.55 million and \$77.64 million per year (all in \$2000).

EPA estimates that reducing impingement by 60% will yield annual benefits of \$7.5 million to \$25.4 million. The benefits of reducing entrainment by 70% will yield annual benefits of \$17.6 million to \$57.1 million.

In interpreting these results, it is important to consider several critical caveats and limitations of the analysis. These caveats have been detailed in the preceding chapters. No commercial fisheries losses, or non-T&E forage species losses, are included in the analysis. Recreational losses are analyzed only for striped bass. There are also uncertainties about the effectiveness of restoration programs in terms of meeting special status fishery outcome targets.

It is important to note that under the Endangered Species Act losses of all life stages of endangered fish are of concern, not simply losses of adults. However, because methods are unavailable for valuing losses of fish eggs and larvae, EPA valued the losses of threatened and endangered species based on the estimated number of age 1 equivalents that are lost. Because the number of age 1 equivalents is substantially less than the original number of eggs and larvae lost to impingement and entrainment, and because the life history data required to calculate age 1 equivalent are uncertain for these rare species, this method of quantifying I&E losses may result in an underestimate of the true benefits to society of 316(b) regulation. Thus, on the whole, EPA believes the estimates developed here underestimate the economic benefits of reducing I&E of special status species.