

Long Term Benefits of Rebuilding

Estimation of Net Present Value

- Components
 - Included User Groups
 - Prices
 - Costs
 - Landings
 - Time Horizon
 - Discount Rate
 - Probabilities
- Interpretation

User Groups

- Analysis includes net benefits to commercial fishing vessels, crew, and consumers
- Analysis excludes use values to recreational angler, processor, and dealer user groups as well as non-use values (existence, option, bequest, etc.)

Predicted Prices

- Price in time t determined by price model
- Predicted price standardized by:

$$P_{2001} * \frac{\hat{P}_t}{\hat{P}_{2001}}$$

- To create constant relative 2001 prices (based on price analysis by Kirkley in Tilefish FMP)

Fixed and Operating Costs

- Fixed costs
 - Average annual from break-even analysis
 - Prorated based on percent of days absent on groundfish trips relative to total days absent
 - Held constant for entire period of analysis
 - Caveats
 - Assumes maintenance of 2001 fleet
 - Fixed costs would be affected by attrition, buybacks, or consolidation

Fixed and Operating Costs (cont.)

- Operating Costs
 - Average cost per day from break-even
 - Total 2001 operating cost based on daily cost multiplied by total DAS from call-in
 - Annual change in operating cost indexed to annual percent change in fishing mortality rates for selected stocks
 - Caveats
 - Change in fishing mortality used a proxy for DAS
 - Assumes composition of fleet and DAS use remains constant

Projected Landings

- Empirical landings from assessment models
- Used BestFit software to fit theoretical probability distributions to empirical cumulative distributions
- Adjustments made to account for recreational landings (Gulf of Maine cod) and shared stocks (Georges Bank cod, haddock, and yellowtail flounder) to identify U.S. commercial landings
- Indexed stocks incorporated using MSY projections with exceptions for No Action and white hake under the Preferred Alternative

Time Horizon

- Selected time period for analysis consistent with rebuilding period for all stocks (2003 to 2026)
- Amendment 7 time horizon was 10 years due to indeterminate end date and only one rebuilding strategy was considered

Discount Rate

- Used Discount rate of 7%
 - Meets OMB requirement
- Sensitivity analysis (0 to 20%) conducted to assess robustness to selected discount rate

Probabilities

- Probability distributions on landings used to conduct Monte Carlo simulation
- Permits construction of confidence intervals on landings, revenues, and other components of net benefit
- Permits identification of rebuilding strategy with highest likelihood of being superior to No Action

Components of Net Present Value

- Total commercial fishing revenue
- Consumer surplus
- Total costs
- Net return to owner profit, crew payments, and resource rent
- Net present value defined as discounted stream of the sum of consumer surplus and net return to profit, income payments, and resource rent

Interpretation

- Formally, not a welfare measure as calculated
 - Need to account for opportunity cost of capital
 - Need to account for opportunity cost of crew
- Incomplete
 - Omission of values to other user groups and non-use values
- Provides a consistent ordinal ranking of rebuilding strategies not estimates of realized benefits

Interpretation (cont.)

- Purpose
 - Examination of rebuilding strategies and time frames
 - Prior to the design of regulatory instruments to implement the chosen strategy
- Practical
 - Holding key uncertainties (price response, changes in costs, and changes in fleet composition) constant isolates the effect of differences in the timing and level of effort changes
 - No dynamic model linking effort to changes in regulatory regime and stock conditions over time
 - Results in net benefit streams under assumed perfect plan implementation at allowable fishing mortality