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