



River Herring Stock Assessment for Peer Review

DEPLETION BASED STOCK REDUCTION ANALYSIS

Models Considered



- Statistical catch-at-age
 - Implemented for some river systems
 - Difficulty in developing CAA for bycatch harvest
 - Difficulty in splitting total catch between the two species (and in creating a set of hybrid life history parameters to describe a “river herring” metaspecies)

Models Considered



- Surplus production model (ASPIC)
 - One-way trip
 - Index data misses the decline in the catch/stock
 - Initial model runs were unstable
- Stochastic stock reduction analysis (SSRA)
 - Need to specify life history parameters (weight-at-age, maturity, M)
 - Vulnerability/selectivity
- DBSRA is a hybrid of these two approaches that gets around some of the issues with both

Depletion-Based Stock Reduction



- Method developed by Dick & MacCall (2010, 2011) to generate management parameters (e.g., OFLs) for data-poor groundfish stocks in the NW
- Requires catch-history and estimates of life-history parameters and current status relative to virgin population
- Uses a Monte-Carlo approach to quantify uncertainty in model results

DBSRA



- Population model:

$$B_{t+1} = B_t + P(B_t) - C_t$$

$$P(B_{t+1}) = \gamma \cdot K \cdot U_{MSY} \cdot n^{\frac{1}{1-n}} \cdot \left(\frac{B_t}{K}\right) - \gamma \cdot K \cdot U_{MSY} \cdot n^{\frac{1}{1-n}} \cdot \left(\frac{B_t}{K}\right)^n$$

- Drawn parameters: C_t , n , U_{MSY}
- Estimated parameters: K

DBSRA



- Peer review panel felt it was not ready for management use, but worthy of further development
 - Explore time-varying K (e.g. due to habitat loss)
 - Explore use of index to tune model (X-DBSRA)