When do we know what we think we know about exploited fish stocks?

Using life history to explore the plausibility of catches affecting fished stocks

**David Keith, Heather D. Bowlby and Freya Keyser**

Overall theme. Ecology vs. practice.

Comparative look among stocks of the same species.

* Within species diversity
* Implications for data-limited applications (how far information can be generalized)
* Rebuilding plans and the spatial/temporal scale of implementation

Among stock variability in productive potential (ICM)

* Lifetime reproductive rates
* Generation time
* Population doubling time
* Reference points (removals)

Practice of stock assessment

* Requirement for prediction
* Need for advice relative to removals
* Basis for understanding impact of human activities on populations

**Introduction**:

Life history and how it forms the basis for ecological understanding of marine fishes.

Objectives:

**Methods** – base this on forwards projections of the ICM; calculation of life history using Leslie matrices based on aging to explore if life history is plausible. Doubling time and lifetime reproductive rate for metrics of life history evaluation.

fits of the ICM in supplement to each stock (cod (15), haddock (8), herring (9), sole (4), maybe plaice (2)?)

**Results** –

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Supplement – quality control ICM mortality assumptions with life history estimator; use reproductive process to tune fits; AKA get best fit possible and provide some justification for why we tuned reproduction not mortality. **Assuming catch is right**

**Simulation to tune on mortality vs. reproduction vs. catch to make the ICM fit**. What is the most plausible driver of mis-fit. M went to zero a lot – need to think about what that implies for over/underestimation of catches.

**Simulation of how much catch would have to be wrong to give a consistent understanding of life history for a single species.** Under the assumption that catch is systematically underestimated. If life history parameters are ridiculous and changing catch can make it fit (life history), then strong argument that catches wrong.

Do life history and stock assessments make sense.

Look at little r coming right out of the stock assessments. Level of variability.

Work flow:

* Basic ICM fits (forward projection because we don’t have to account for historical fishing on r in future projections).
* Simulation on plausibility
* Life history comparison (first principles, Leslie – combine juvenile stages). Make sure works if we don’t have survival from egg to earliest juvenile.