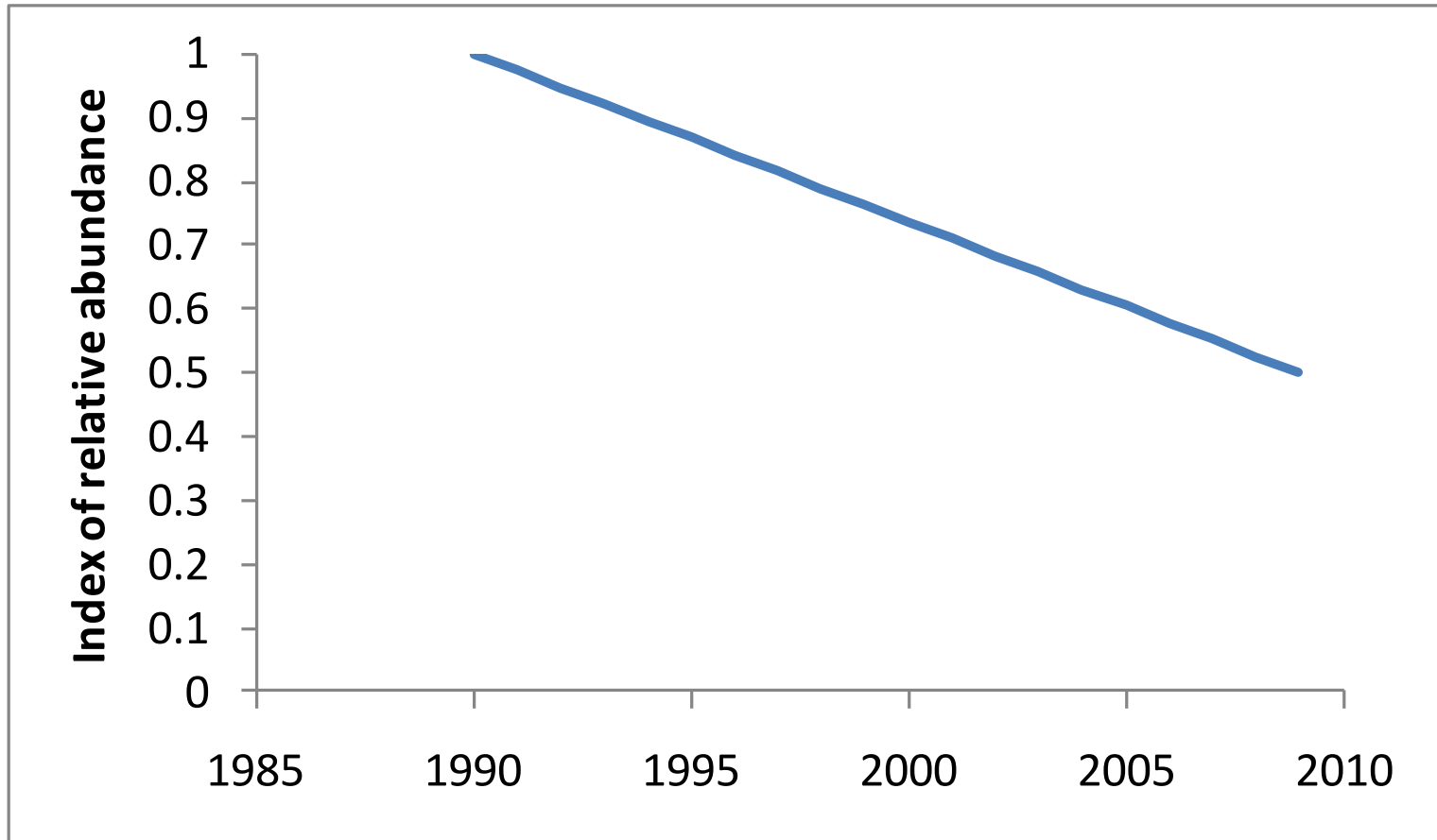


# Brief introduction to stock assessment modeling



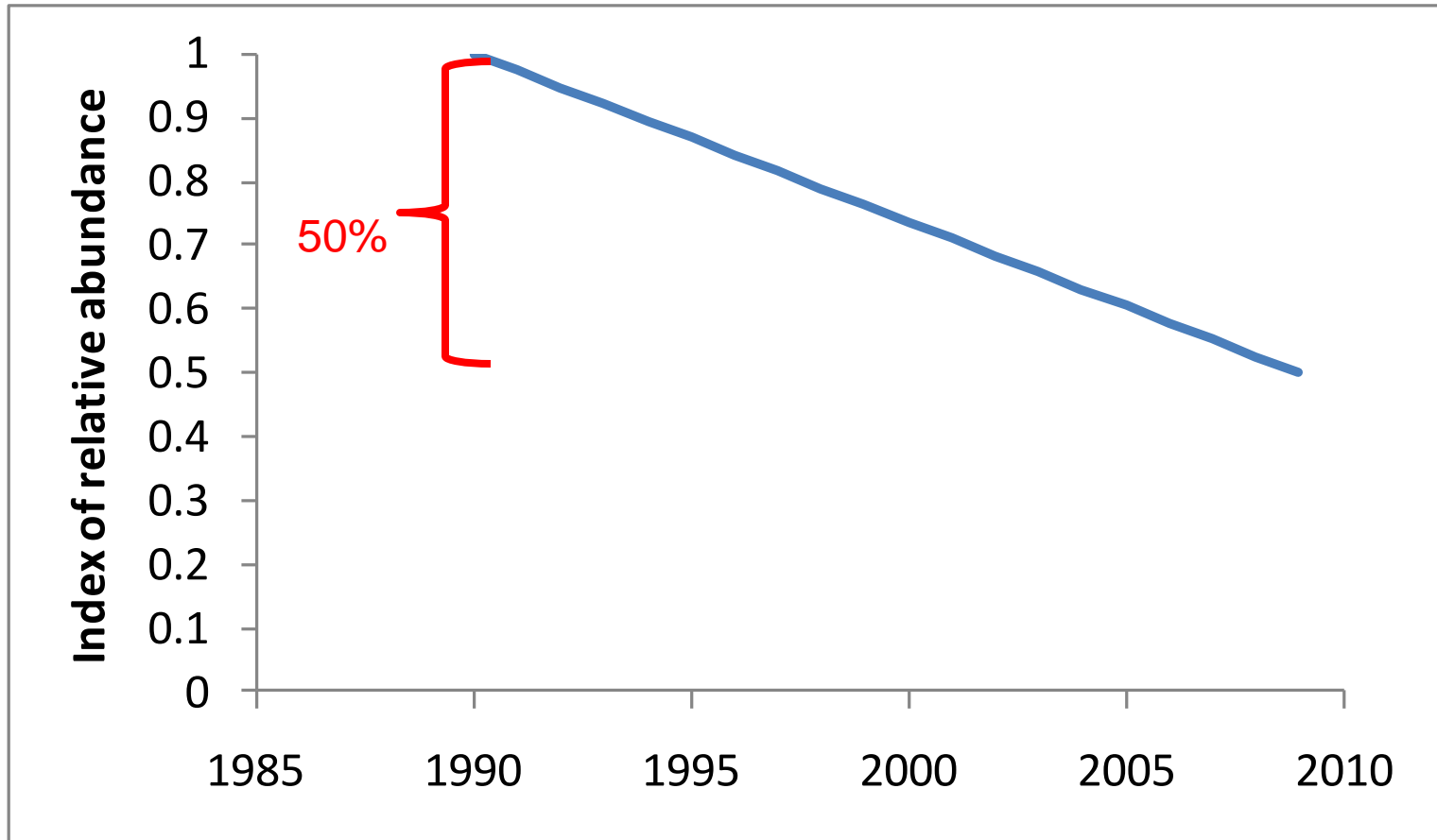
# Indices of abundance

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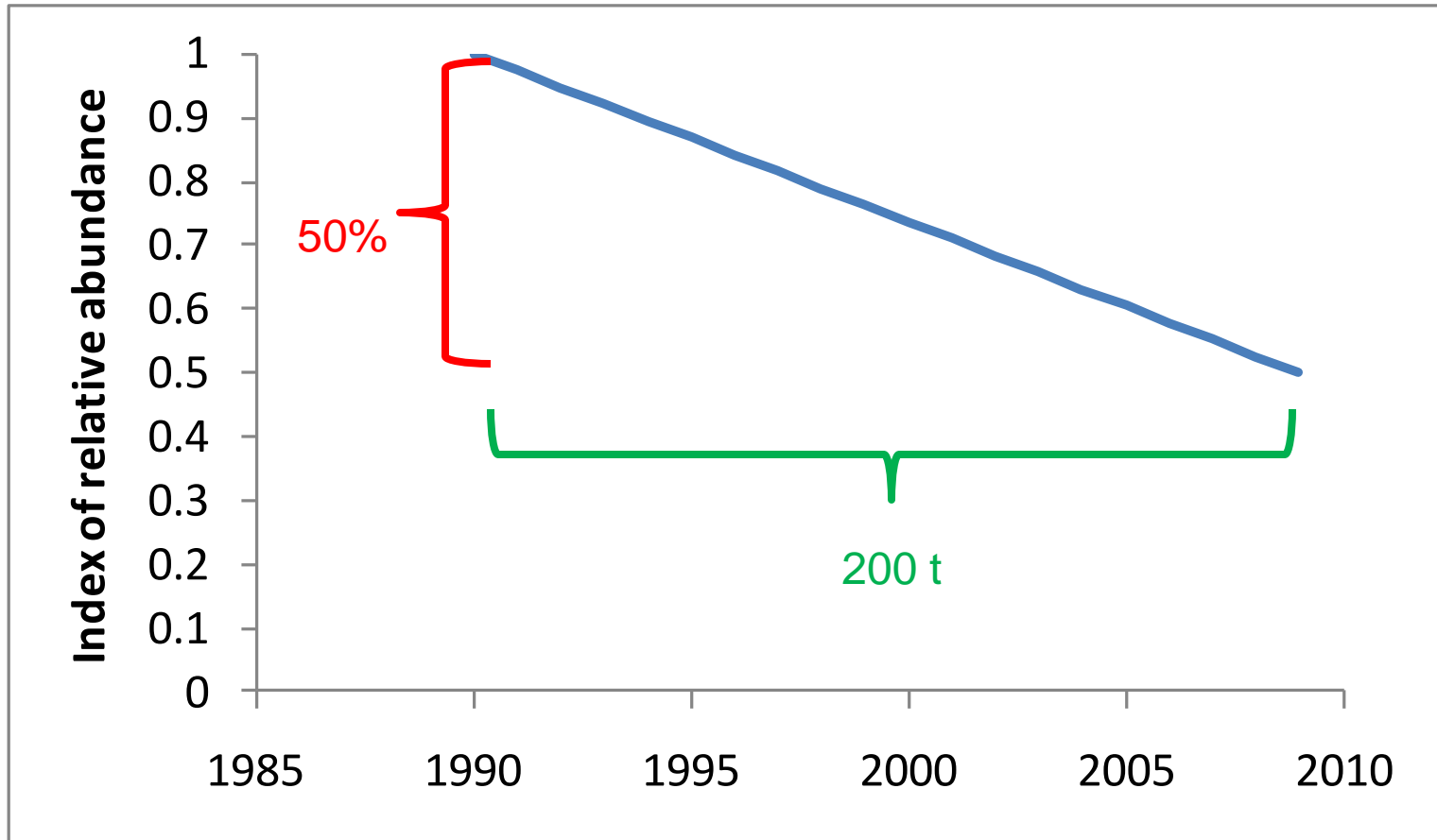


# Indices of abundance

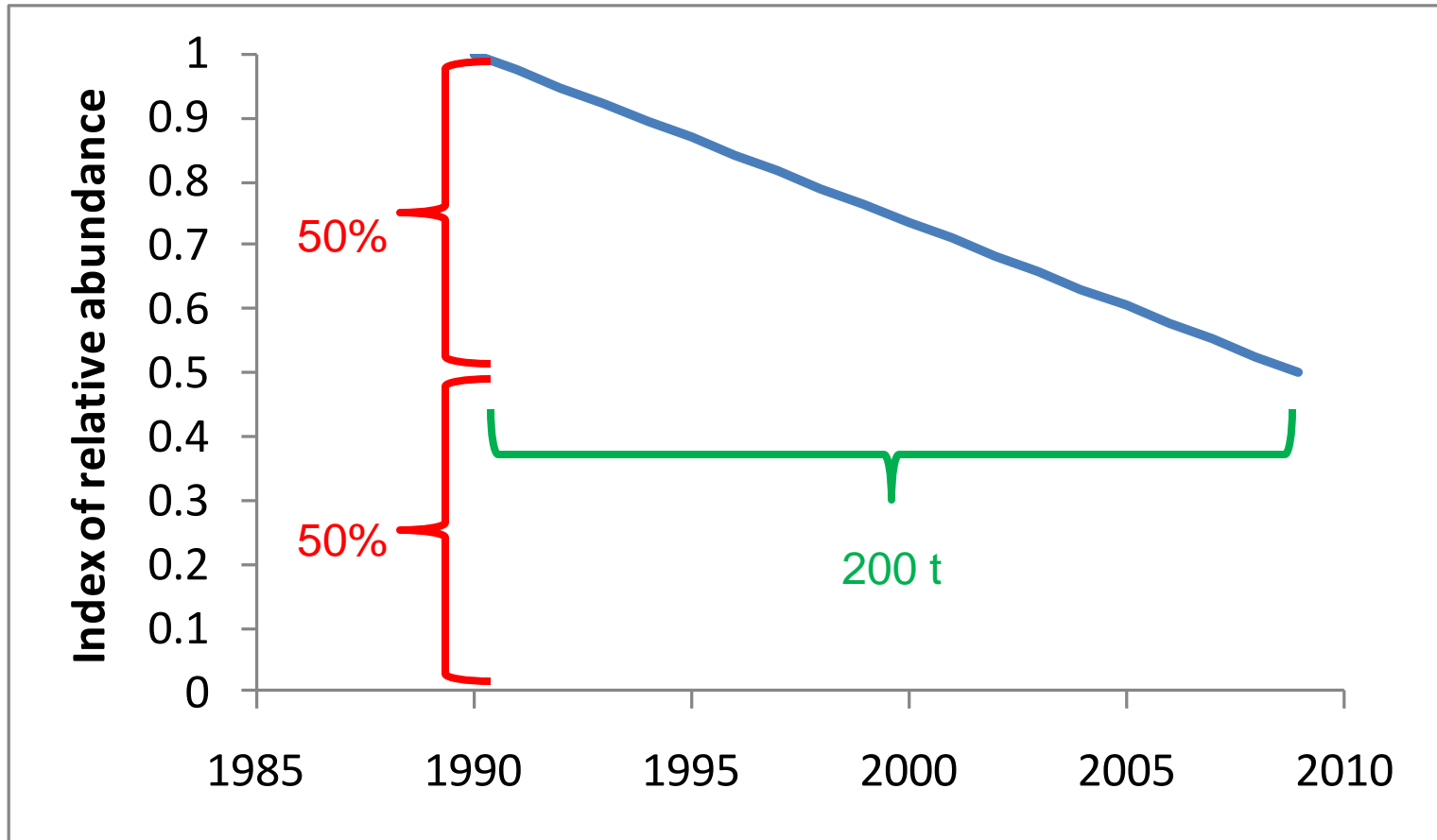
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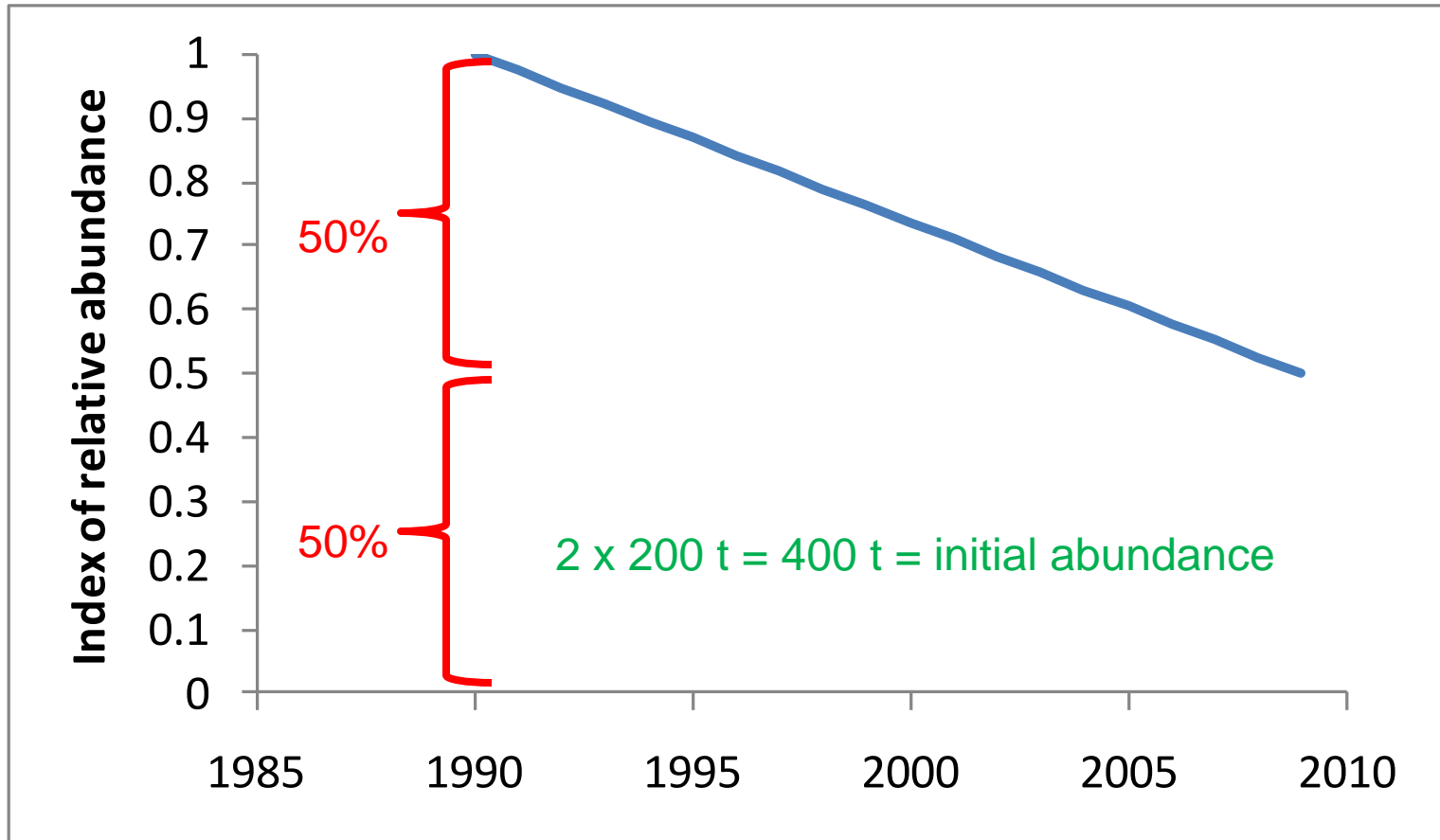
# Indices of abundance



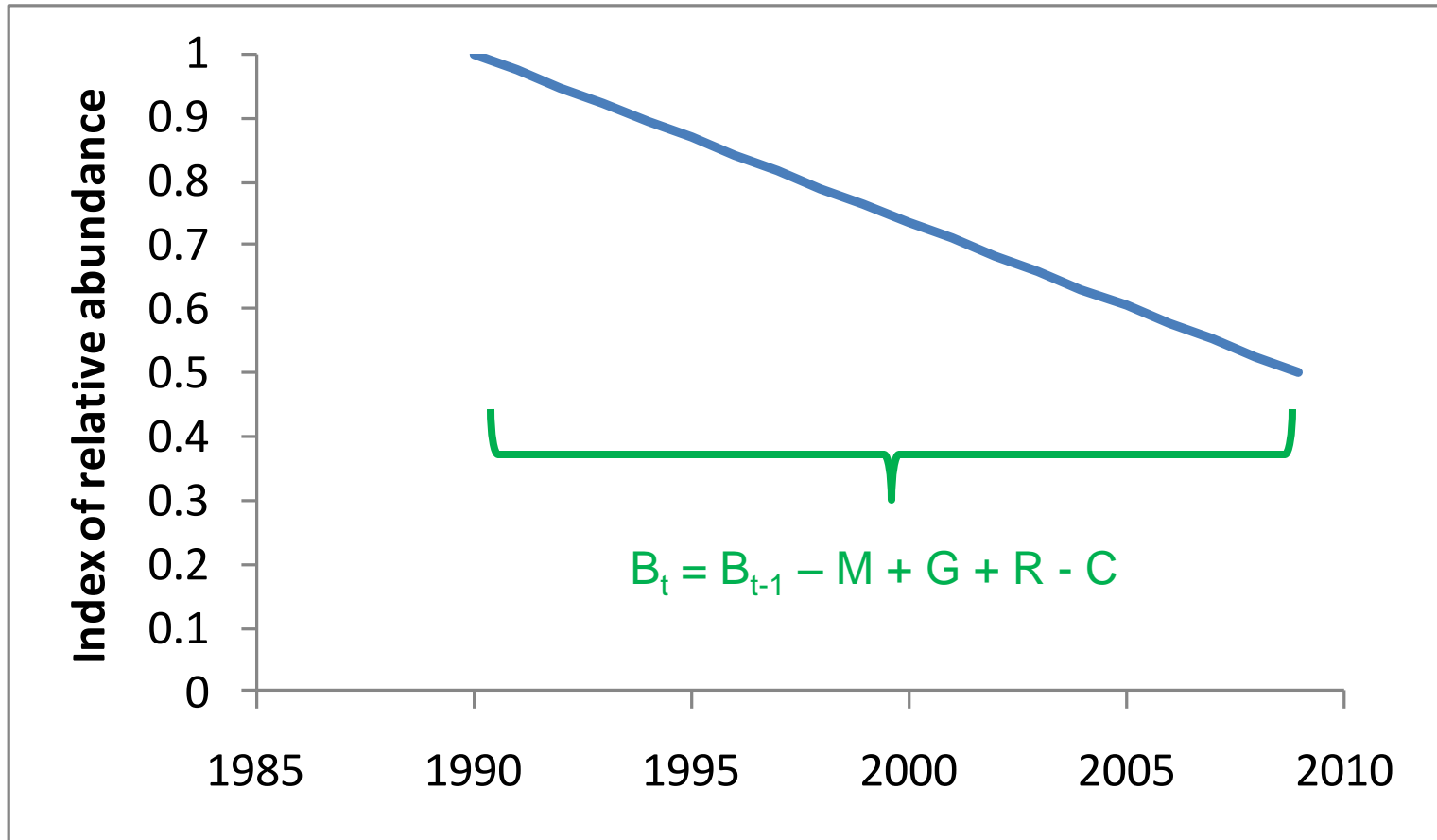
# Indices of abundance



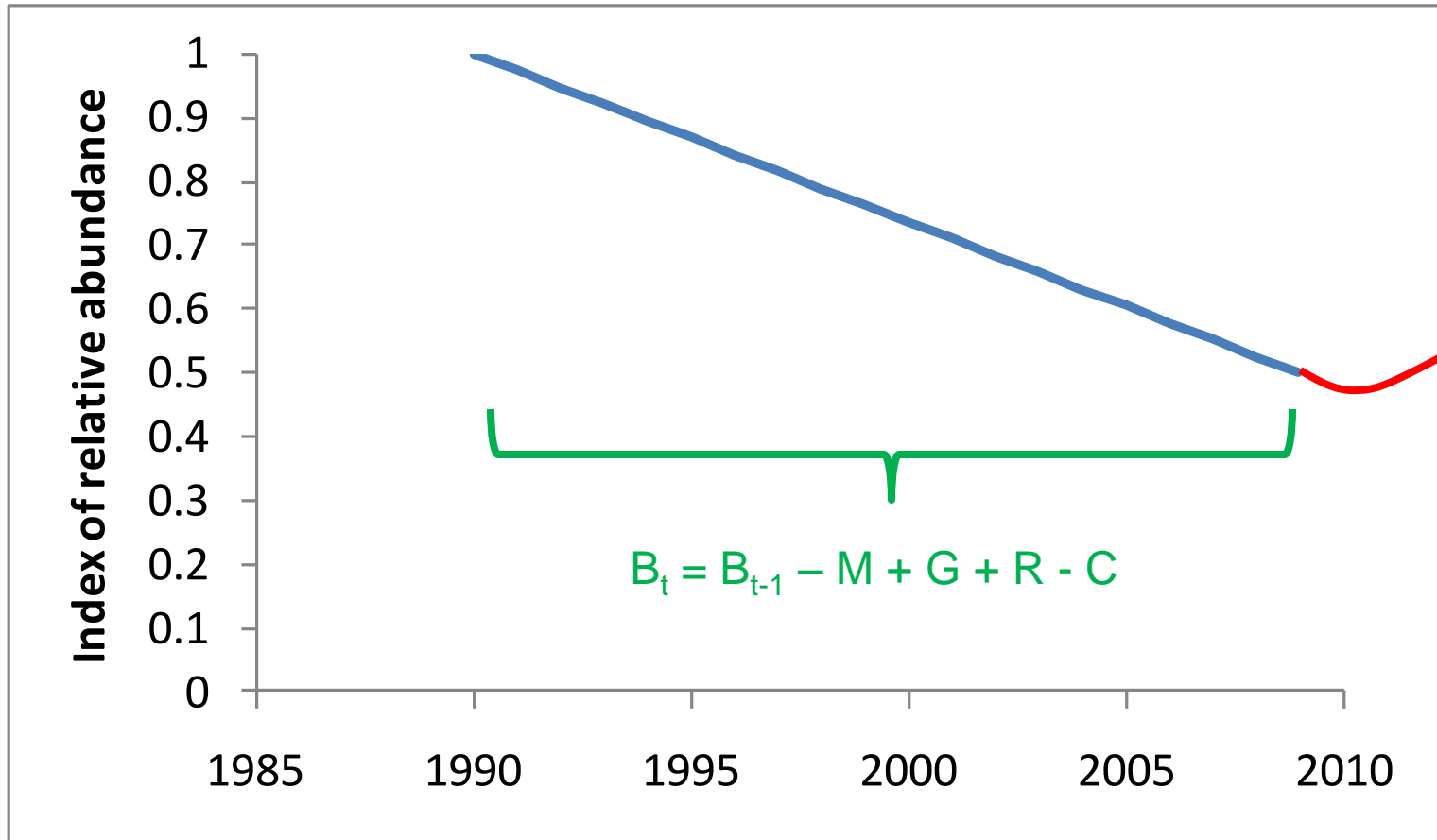
# Indices of abundance



# Indices of abundance



# Indices of abundance





# Stock assessment guidelines

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1. A population dynamics model is needed to interpret indices of relative abundance and management action



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# Stock assessment guidelines

---

1. A population dynamics model is needed to interpret indices of relative abundance and management action
2. It is important to model the size or the age of the individuals because different fisheries catch different components of the stock
3. Some measure of catch is needed for all fisheries
4. Composition data is needed to provide information on selectivity and recruitment



# Stock assessment data needs

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1. Index of abundance
2. Catch
3. Composition
4. Biology



# Catch

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- Desirable
  - Total catch for each year in the model for each fishery
- Acceptable
  - Catch for a component of the fishery and an index of catch for the other components
  - Total catch for some years and an index of catch for other years
- Last resort
  - Share information from other fisheries
  - Guess



# Calculating missing catch years from effort (simplified example)

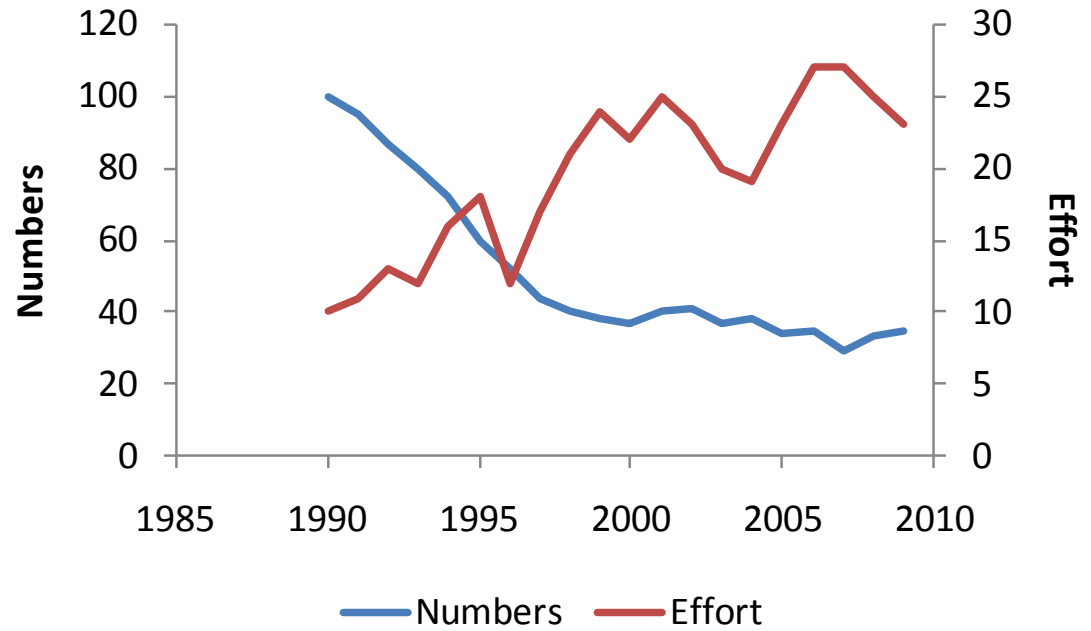
- $C_y = qE_yN_y$

Catchability  
coefficient

Effort

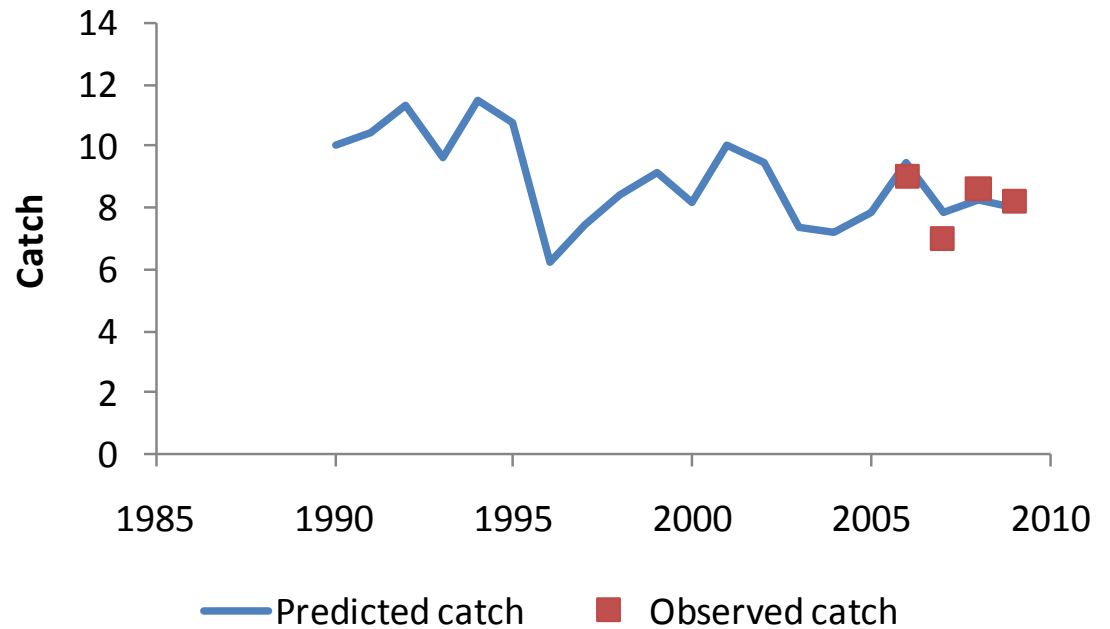
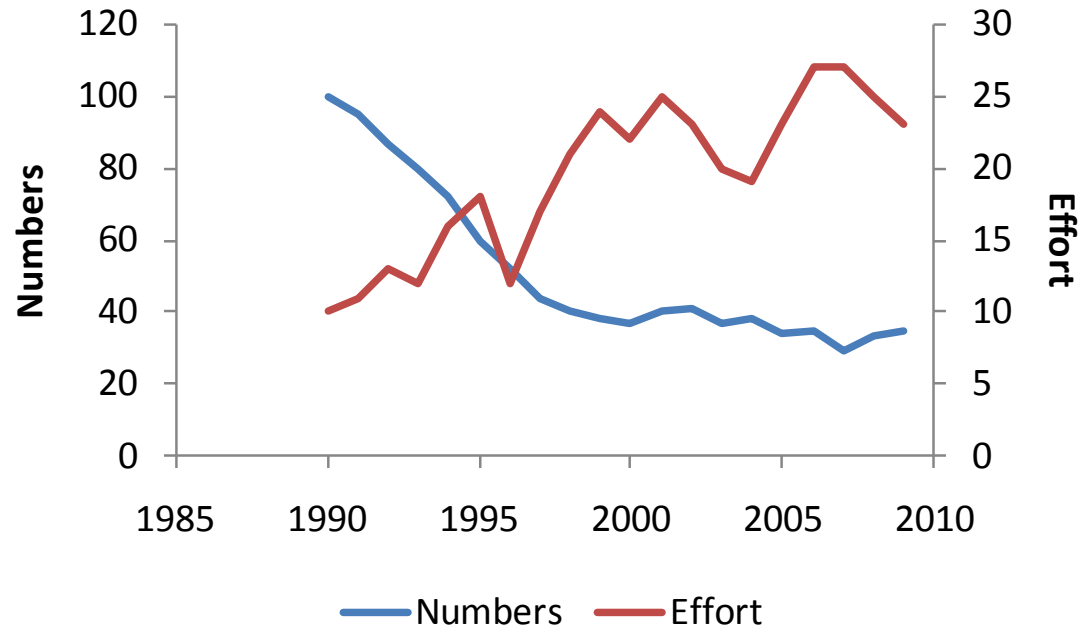
Number

- $C_y = qE_y N_y$





- $$C_y = qE_yN_y$$



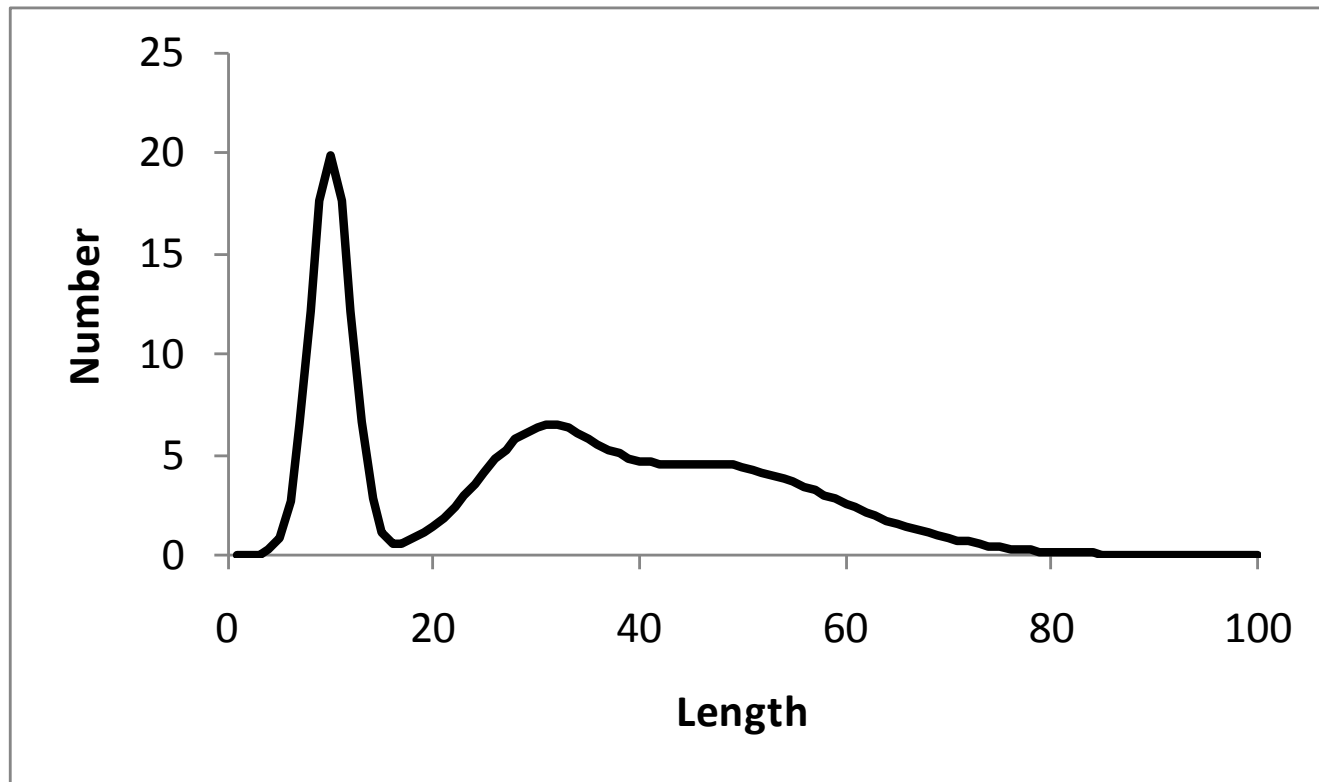
# Composition data

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- Selectivity
  - Need a few years for all fisheries
  - Take the fish out at the right age/size
- Recruitment
  - Need for most years from any fishery
- Exploitation rate
  - Need for a few years from any fishery

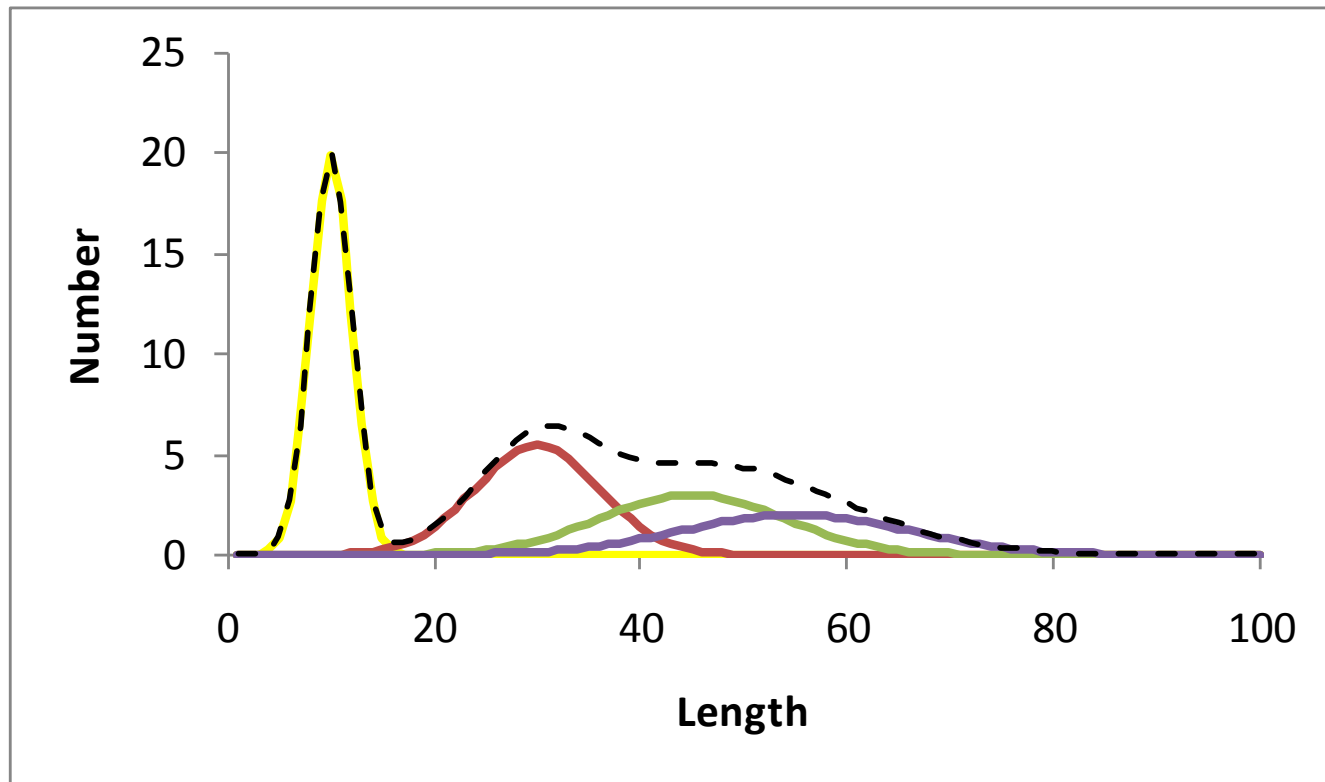
# Length composition: recruitment

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# Length composition: recruitment

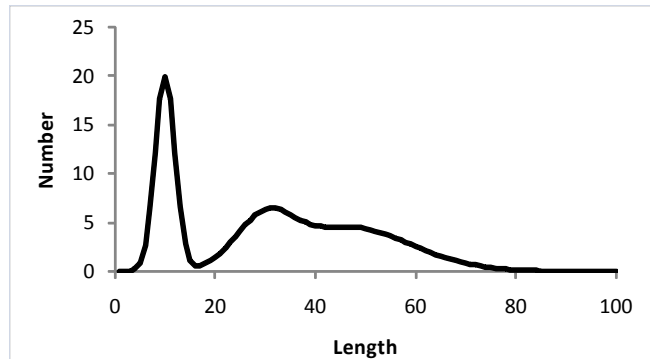
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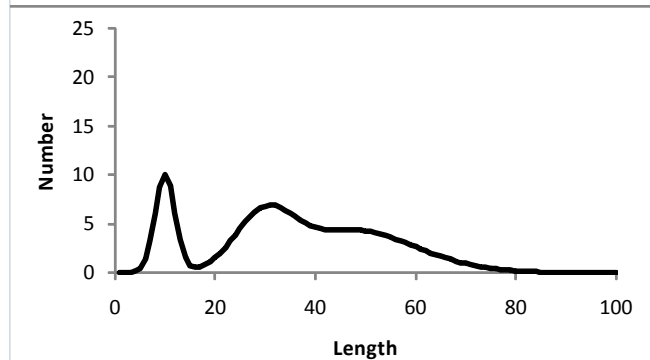
# Length composition: recruitment

Recruitment

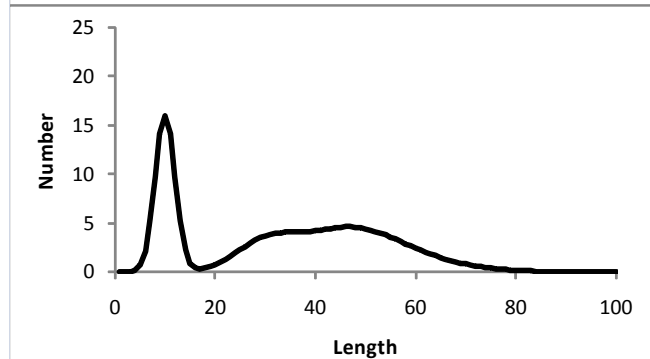
High



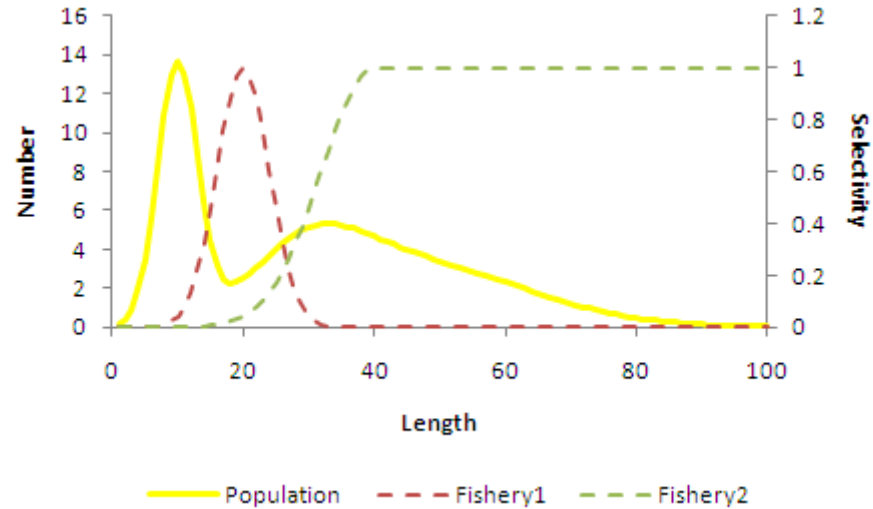
Low



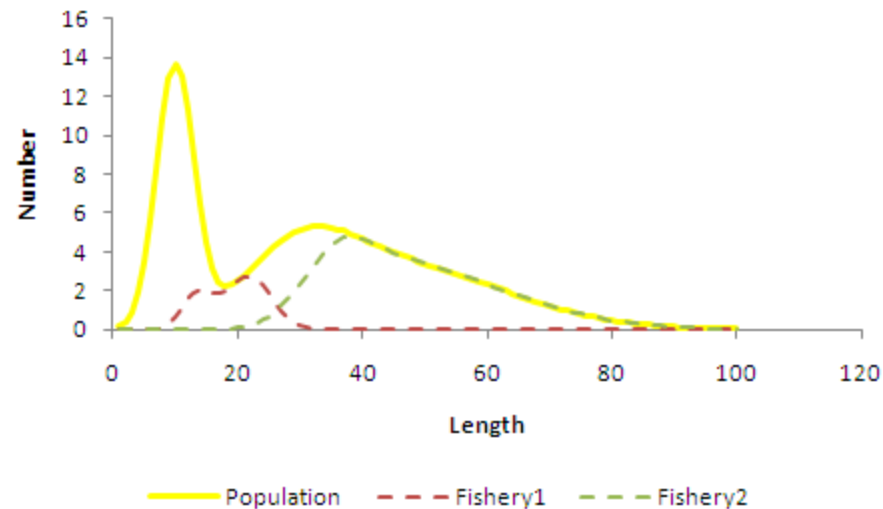
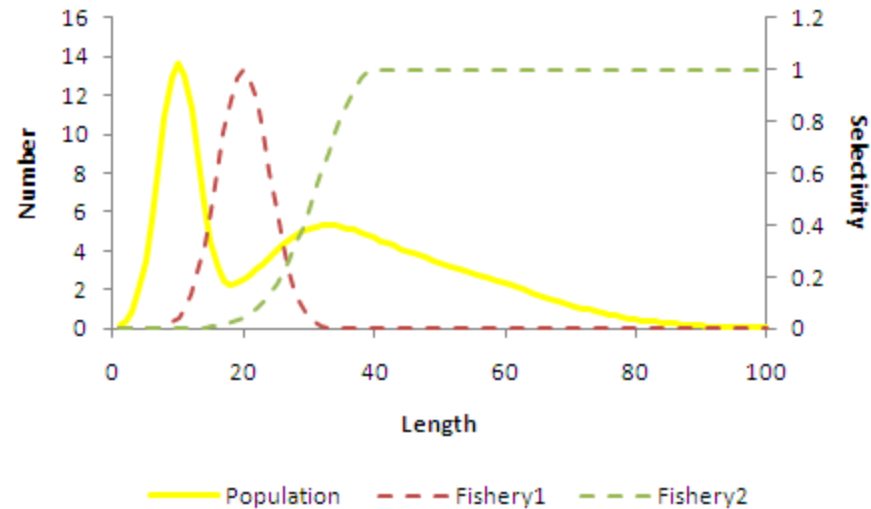
Moderate



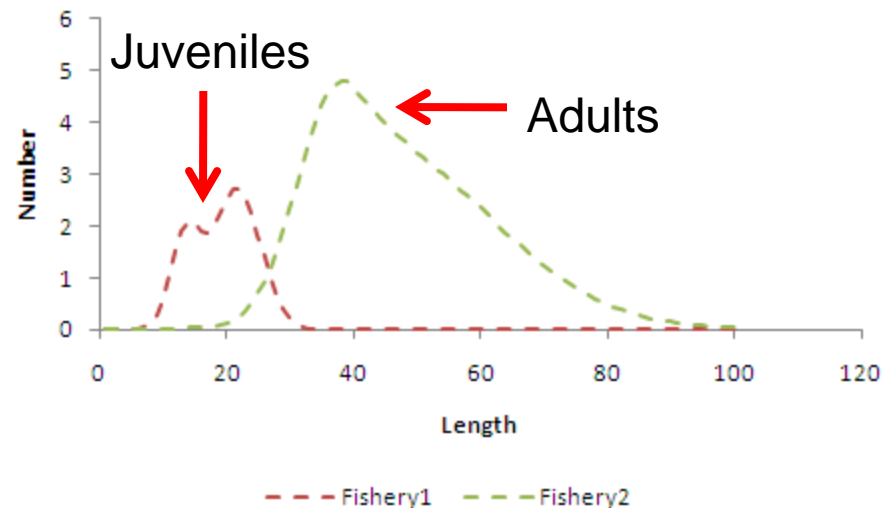
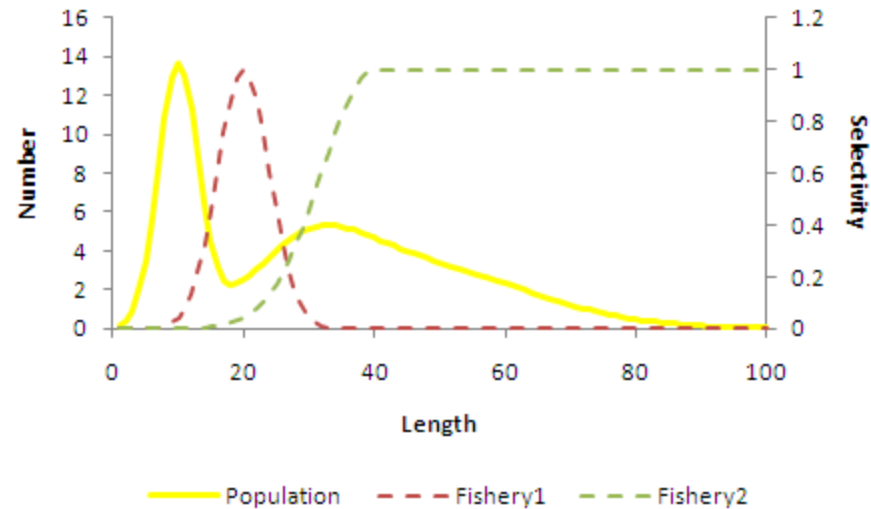
# Length composition: selectivity



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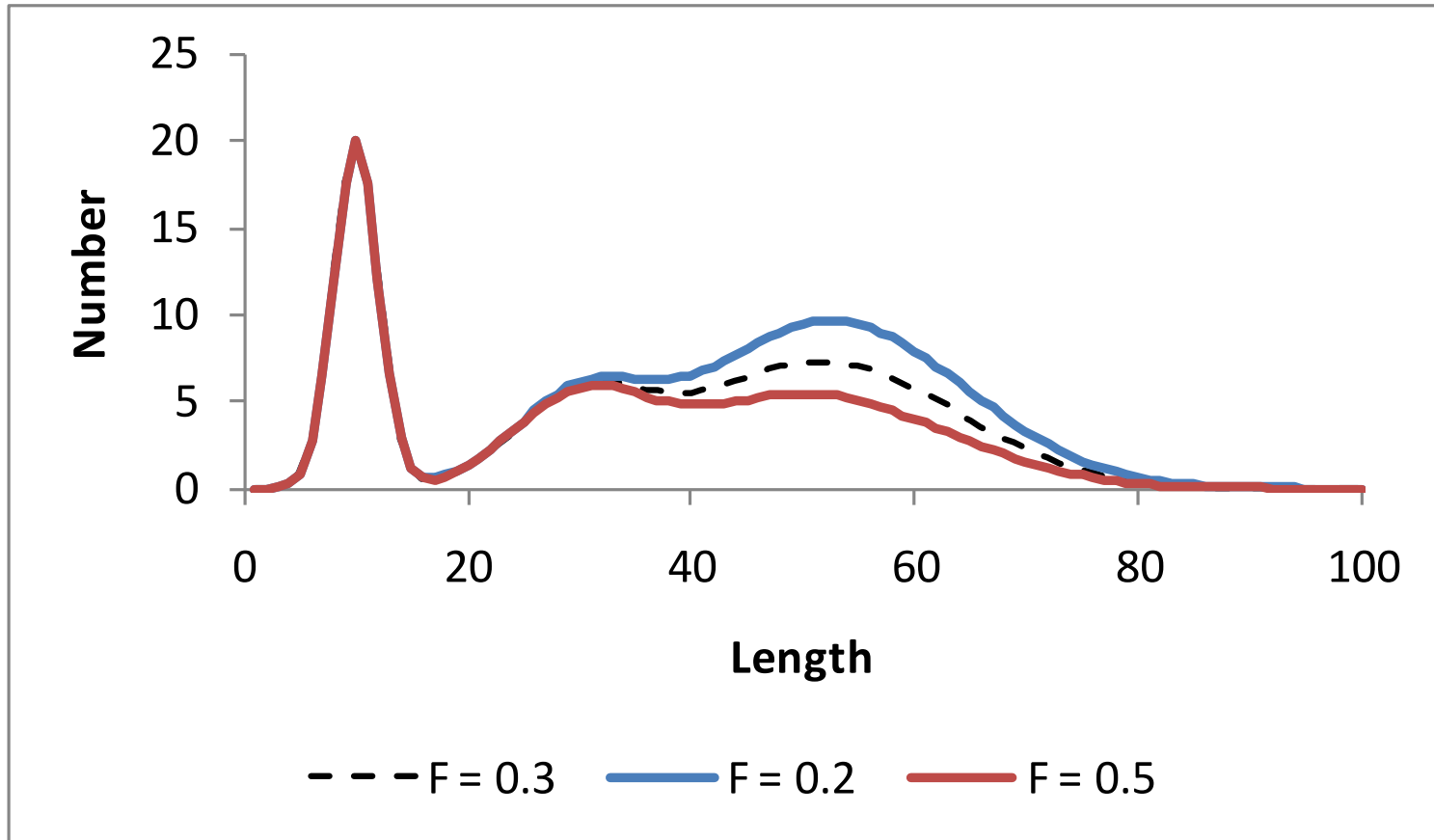


# Length composition: selectivity





# Length composition: exploitation



# Biology

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- Length-weight
- Growth
  - Aging
- Natural mortality
  - Mark-recapture
- Reproduction
  - Maturity
  - Fecundity
- Stock structure
  - Tagging
  - Genetics

