# Purpose

To outline the steps required to generate an age-structured population for a generalized species, for use in an observation model.

1. This will first require **input parameters** for a given species.
   1. Start with a sablefish-like species for now
2. Specify **N (total abundance at year 1 for recruit age)** at the start of the simulation
   1. Calculate **SSB** (spawning stock biomass) for this year (maturity at age \* weight at age \* numbers)
3. Calculate **recruitment** (predicted recruitment via a stock recruit relationship) for a given year
4. Update **total abundance and biomass, as well as SSB**
   1. Apply natural mortality rate on the population
   2. **Simulate until our population reaches equilibrium**
   3. Apply fishing mortality rate/catch and selectivity on the population
   4. Predict catch or F – depends on if we go from C to F or F to C
   5. Repeat this but for the plus group
5. Generate age comps from the fishery with proportions equal to catch at age
6. Generate fishery index of abundance using I = q \* N \* w \* selex (make sure to sum these after to get one aggregate index)
7. Generate age comps from the survey with proportions equal to the expected catch at age for the survey
8. Generate survey index of abundance using I = q\* N \* w \*selex (make sure to sum these after to get one aggregate index)