

## Management Strategy Evaluator = *User notes (alpha ver. 6.0.6.1112)*

### Inputs

**Input uncertainty** Sets inputs use for the perturbation of variables.

#### Groups

- **CV** Coefficient of variation used for perturbation of biomass.
- **Kalman weight** Kalman weight used for perturbation of biomass.

#### Fleets

- **CV** Coefficient of variation used for perturbation of effort.
- **Annual increase in catchability** Amount catchability will increase each year.

**Input reference levels** Sets reference levels for performance evaluation and target fishing mortalities.

- **MSY** Uses the results a Maximum Sustainable Yield search to set Biomass limit, Biomass base and F max. for the target fishing mortalities.

**Group** Evaluation of model runs has not been implemented yet so setting of reference levels has no effect.

- **Biomass lower** Lower biomass limit.
- **Biomass upper** Upper biomass limit
- **Catch lower** Lower catch limit on a group.
- **Catch upper** Upper catch limit on a group.

#### Fleet

- **Lower** Lower catch limit by a fleet.
- **Upper** Upper catch limit by a fleet.

**Input regulatory** Sets inputs used for the fisheries regulations.

**Regulatory option** Sets how the effort of a fleet will be regulated.

- **Max effort** *Not implemented at this time.* Caps the effort of a fleet no matter what regulatory option has been chosen.
- **Not used** No regulation will be used for this fleet.
- **Effort** *Warning has not been tested or validated.* Target fishing mortality is computed using a perturbed biomass. If target fishing mortality exceeds achieved fishing mortality then fishing effort is scaled back.
- **Weakest Stock quota** Quota for the year is computed from the target fishing mortalities using a perturbed biomass. Effort is regulated if any catch (landings + discards) on a group exceeds its quota.
- **Strongest stock + discards quota** Quota for the year is computed from the target fishing mortality using a perturbed biomass. Effort is regulated if landings on the strongest stock exceed the quota. Catches that exceed the quota are discarded.
- **Selective fishing quota** Quota for the year is computed from the target fishing mortality using varied biomass. Effort is regulated if landings on the strongest stock exceed the quota.
- **Fleet Quotas** Quota by group and fleet used to compute fleet share of quota on a group.
- **Target fishing mortality** Sets parameters for target fishing mortality. Biomass limit, Biomass base and F max.
- **Fixed escapement** Sets fixed escapement biomass of a group. If this value is non zero the quota for the year is computed as [estimated biomass] - [fix escapement] instead of using the target fishing mortality parameters.

**Input effort tracking** Sets weights used when evaluating current Ecosim scenario.

- **Objectives weights**
- **Ecological weights**
- **Fleet weights**

### Outputs

**Run MSE** Run the Management Strategy Evaluation.

**Effort and regulatory options** Options used to set how or if the fishery is regulated during the current evaluation.

- **Predict effort(fleet size dynamics) regulate using quotas** Fishing effort for the year is predicted using the Ecosim Fleet/effort dynamics model. The fishing quota for each year is then set via the target fishing mortality. The fishing effort is then regulated according to the options selected in the **Regulatory options** dialogue.
- **Ecosim effort regulate using quotas** Ecosim is run using effort from the current scenario. The fishing effort is then regulated according to the target fishing mortality and the options selected in the **Regulatory options** dialogue.
- **No regulations evaluate current Ecosim scenario** Ecosim is run using effort from the current scenario. No attempt is made to regulate the fishing effort. This option is used to evaluate the current Ecosim scenario.

**Model run options**

- **Save output** Saves output for biomass, catch by group, catch by fleet and effort by fleet to a csv file in a sub directory of the current EwE6.exe called MSE.

**Ecosim scenario options** Option on how perturbations are implemented when the **No regulations evaluate current Ecosim scenario** option is in effect.

- **Catch/estimated biomass** Fishing mortality is estimated using a perturbed biomass then effort is updated using the varied fishing mortality.
- **Direct exploitation** Fishing mortality is computed directly from the predicted Ecosim catch and biomass then perturbed and used to update effort.
- **Exact biomass known** Fishing mortality is computed directly from the predicted Ecosim catch and biomass. Effort is then update with the predicted fishing mortalities and perturbed before use.
- **Plots** Not implemented yet.
- **Results** Not implemented yet.

## How to run the model

*Still to do.*