

## MSE Batch plugin user notes

10 Sept, 2010

### Overview

The MSE Batch plugin runs the MSE (Management Strategy Evaluator) in batch mode from a command file. The command file runs the MSE changing input harvest rule parameters for each iteration and outputting data file.

MSE parameters available through the command file.

- i. Number of MSE simulations
- ii. End Year
- iii. Assessment and Implementation error
- iv. Primary Production forcing functions
- v. Primary Production forcing function variation
- vi. Fleet Control types
  - 0 No controls imposed on fleet
  - 1 Weakset stock
  - 2 Highest value stock
  - 3 Selective fishery
- vii. Harvest rules
  - Fishing Mortality
  - Total Allowable Catch
  - Target Fishing Mortality (hockey stick parameters)

### How to run

*still to do Load the MSE batch plugin interface from the MSE in the navigation tree Load a command file hit the run button*

### MSE Batch iterations

The MSE Batch loops over Forcing Functions, Fleet Controls and Harvest Rules running the MSE for each set of parameters from the command file. Parameters not set by the command file will be left at the values loaded by the current Ecosim model.

*Sample looping structure:*

```

For each Forcing Function
  For each Fleet Control
    For each Harvest Rule

      MSE run...
      WriteOutputFile...

    next Harvest Rule
  next Fleet Control
next Forcing Function

```

### Command file format

The command file is a CSV (coma separated values) file that contains tags. A tag is a predefined string of text that appears at the start of the line and is used to identify the line as valid input for the MSE module. After the data part of the tag there must be a least one empty entry to mark the end of the valid data. All data that appears after the empty entry will be ignored. For example

```
Control_File_Version,1.0,,,ignored comments,,,
```

Lines in the command file that do not contain a recognized tag will be ignored. This allows a command file to contain comments, notes or other non parameter information as long the line does not start with a valid tag. The order of the tags in the file is not important and the command file

can contain as many lines as the user wants.

## Tags

### Control\_File\_Version

```
Control_File_Version,1.0,,
```

- Version number of the control file 1.0 for the current version. Used to identify parameters that may be in the file.

### Model\_Name

```
Model_Name,Some model.ewemdb,,
```

- File name of the EwE model
- Used to check the command file against the currently loaded EwE model. If the models do not match a warning is issued.

### Ecosim\_Scenario

```
Ecosim_Scenario,Scenario1,,
```

- Name of the Ecosim Scenario that the command file can work with. If the scenario name does not match a warning is issued. However, the command file can still be run.

### Run\_Type

```
Run_Type,1,,
```

- Type of harvest rules to set for the current MSE Batch run. For each run of the MSE the harvest rules for the other Run\_Type's will be set to zero.
- Valid inputs,
  - 1 Fishing Mortality (Constant\_F) sets the fishing mortality rates to a constant value for the run,
  - 2 Total Allowable Catch (Constant\_Y) sets the catch to a constant value for the run,
  - 3 Target Fishing Mortality(Hockey stick) sets the fishing mortality using the Target Fishing Mortality rules,
  - 0 Any when this Run\_Type option is set the harvest rules for other Run\_Types will not be set to zero. Harvest rule values for groups not explicitly set by the command file will use the values in the currently load EwE model. This option allows for different types of harvest rules during the same MSE run.

### Number\_Sims

```
Number_Sims,50,,
```

- Number of Ecosim simulation the MSE will run for each iteration. This is the 'Number of trials' parameter on the MSE run form.

### Error\_CV

```
Error_CV,0.3,,
```

- Coefficient of variation for the observation and implementation error for the MSE stock assessment model. This is the equivalent of the Group CV's in the MSE interface.

### Output\_Directory

```
Output_Directory,C:\EwE data,,
```

- Directory where the MSE batch output will be sent. The MSE batch will try to create the directory if it does not already exist.

### End\_Year

```
End_Year,-1,,
```

- Last year (time step) the harvest rules are applied to the simulation run.
- Valid values
  - -1 Harvest rules will be applied for the complete simulation run.
  - > 0 Harvest rules will be stopped before the end of the run. For all years greater than End\_Year the simulation will use the current Ecosim Fishing Effort.

**PP\_STDEV**

```
PP_STDEV,0.5,,
```

- One standard deviation for normal distribution of Primary Production variance.

**PP**

```
PP,1,Increasing,10,,
PP,2,Decreasing,10,,
```

- Primary Production forcing function from the currently loaded Ecosim model to load for an MSE Batch iteration.
- Each line in the command file loads a separate forcing function then loops over all the Fleet Controls and Harvest Rules applying the parameters from the file.
- Valid inputs
  - Forcing function index for the currently load Ecosim model. See EwE Scientific Interface "Time dynamics (Ecoism)>Forcing function" for the currently loaded forcing functions and indexes.
  - Name of the forcing function. This is used to check the forcing function name in the file against the name in the EwE model. If they do not match then a warning will be posted but the run can still continue.
  - Ecosim group index to apply the forcing function to. Ecosim needs to know which primary production group to apply the forcing function to. If the Group index does not match a primary producer group in Ecosim then the MSE Batch will post an error and will not run.

**Control\_Type\_INDEX & Control\_Type**

```
Control_Type_INDEX,1,2,3,,
Control_Type,2,0,0,,
Control_Type,0,2,0,,
Control_Type,0,0,2,,
```

- *Still to do what is a fleet control.*
- Control\_Type\_INDEX fleet indexes from the EwE Scientific Interface that a Control\_Type will be applied to.
- Control\_Type type of control to apply to an EwE fleet. See EwE Scientific Interface "Tools>Management procedures (MSE)>Input>Regulatory>Control type".
- Valid inputs,
  - 0 No controls will be imposed on the fleet,
  - 1 Weakest Stock controls will be imposed on the fleet by the stock with the greatest limitation,
  - 2 Highest Value controls will be imposed on the fleet by the stock with the highest market value, discard mortality rate set in "Input data>Fishery>Discard mortality rate",
  - 3 Selective fishery controls are imposed the same as Highest Value (2) except all the discards are assumed to survive.

**Constant\_F\_INDEX & Constant\_F**

```
Constant_F_INDEX,10,,
Constant_F,0.1,,
Constant_F,0.2,,
Constant_F,0.3,,
Constant_F,0.4,,
Constant_F,0.5,,
```

- Fixed fishing mortality the MSE will set the fixed fishing mortality on the group to the value in the Co
- Constant\_F\_INDEX index of group that the F will be applied to. This only needs to include groups that are to have there quotas set.
- Constant\_F fishing mortality on the group. See "Tools>Management procedures (MSE)>Inputs>Regulatory>Fixed F, Escapement,TAC"

**Constant\_Y\_INDEX & Constant\_Y**

```
Constant_Y_INDEX,10,15,,  
Constant_Y,0.1,10.2,,  
Constant_Y,0.2,11.2,,  
Constant_Y,0.3,12.2,,  
Constant_Y,0.4,13.2,,  
Constant_Y,0.5,14.2,,
```

- The MSE will set the quota on the group base on the Constant\_Y (Total allowable catch in MSE interface) value in kg/km2/month.
- Constant\_Y\_INDEX index of group that the yield will be applied to. This only needs to include groups that are to have there quota set.
- Constant\_Y Yield of the group in kg/km2/month. See "Tools>Management procedures (MSE)>Inputs>Regulatory>Fixed F, Escapement,TAC"