In the new EwE v6 release (v.6.3), you will find the new routine under Navigator > Ecosim > Tools > MSY.

In the new routine there are mainly two analyses:

1. First part

The first part ("Run", "Assessment to display" and "Data to display") is what in the old v5 used to be the main screen: the search for Fmsy and MSY by group and fleet.

Here users can search MSY values for individual groups or fleets. Users can pick a group or a fleet to assess, and select a max.rel.fishing mortality (e.g. a multiplier of F) when searching by group, or a fishing effort multiplier when searching by fleet. Additionally, users can specify the number of steps used in this assessment. Higher numbers of steps mean more MSY assessment points, thus more precise results, but longer run times. Note that the number of search steps is fixed when assessing by fleet, this is by design.

This part is handy to analyse group by group, or fleet by fleet, while customizing F upper ranges and assessment granularity.

Users also have the ability to specify a number of trial years, which is the number of years that Ecosim runs for every assessment. In v5 this parameter was hidden and fixed at 40 years. In EwE 6.3 the default value is kept at 40 years, but users can increase the value to get more accurate results, or lower the value to speed up computations.

In terms of MSY assessments, here users have (1) a "Full compensation" assessment, where groups that are not being assessed are set to F=Fcurrent (or F at the Ecopath baseline value) and groups are allowed to interact, and (2) the "Stationary system", where there are no interactions between species (the Bs or the groups that are not assessed are kept constant through the simulations). These two methods are well explained in Walters et al. 2005.

The MSY assessments automatically save.csv files if this option is turned on (in line with the new auto-save behaviour in EwE 6.3). The .CSV files are slightly different from v5. You will notice a big header in the file that states the model origin and other handy bits, as well as the group or fleet that was assessed, a Fbase value (when assessing by group) and whether Fmsy was found. More about that later.

2. Second part

The second part of the routine can be found under the header "Tools" at the left hand of the MSY page, accessible via the button "Find Fmsy's". This is the central part of the v5 "Find Fmsy's" routine, but is (for now) provided without a user interface. Activating this routine automatically produces .CSV files with the Fmsy's for all the groups using both methods above (full compensation and stationary system). This FMSY analysis shares "max.rel.F" and "number of steps" values with the MSY analysis above.

The .CSV files produced by the Fmsy search contain a few extra columns in comparison with v5. First, the columns CmsyAll and VmsyAll contain the results at the end of the Ecosim simulation and represent predicted equilibrium values under the all-species Fmsy policy (which should not be confused with a maximization of multispecies MSY) using either Fmsy calculated with full compensation and stationary system methods. Additionally, the .CSV files contain a column "FmsyFound" that states whether the selected F interval was sufficient to find true Fmsy values.

A note about finding true Fmsy values:

We realized that some groups do not reach max catches within the default rel.max.F / max F multiplier range, and sometimes even require max F values up to orders of magnitude larger than the default F max before experiencing dropping catches. This happens frequently with invertebrates or other organisms that are lightly fished and that need more effort to be "wiped out".

For these groups, v5 reported Fmsy values at F max where catches were still increasing and had not started dropping yet. V5 was lacking the means to know if such Fmsy and MSY values were true 'top of the curve' values, or simply the maximum value obtained at the end of a (too short) assessment.

We fixed this in the new release. We added a simple algorithm that performs the following check: if the mean catch of a group over the highest three F values is less than the max catch over the entire assessment, and this max catch was not produced by any of the highest three catch values, then Fmsy was found. It's a geeky way to detect whether the catches have started dropping after a detected maximum.

The result of this check is reflected in the assessment .CSV files. In the MSY group assessments the "Fmsy" field may state "Fmsy not found in selected F range". In the FMSY assessments, the column "FmsyFound" column will contain '1' values for proper max catch, and '0' values to indicate that the catch curve for a given group did not start sloping down past a detected maximum.

The fleet assessments .CSV files do also reflect the result of this Fmsy detection.