## Wikiprint Book

**Title: EwEugEcosimExercise**

**Subject: Ecopath Developer Site - EwEugEcosimExercise**

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## 9.1 An Ecosim exercise

Below is a cursory check of Ecosim's behaviour, which it is advised that you check out.

After loading an Ecosim scenario:

i. Go straight to the Run Ecosim form. Click 'Run'. Make sure everything is flat or changing according to the Biomass Accumulation you specified in Ecopath. Crazy cases: discard effects may cause troubles.
ii. Next: Go to Ecosim parameters: set the Duration of simulation to 30-50 years. Make a small disturbance for the combined fishery using the sketch pad on the Biomass form. If everything is okay in the settings it should come back to the initial value eventually. Are all groups reacting at the speed you expect them to?
iii. Next, go to the Group info form
iv. Next take out feeding time dynamics, set to zero.
v. Set the unexplained predation to 0 throughout.
vi. Next, go to Vulnerabilities (the most important tab in Ecosim). Set to 100 (top down control).
vii. Reset F's.
viii. Run: seems okay?
ix. Create a small disturbance.
x. Run and you will get chaotic behaviour, violent oscillations and groups dropping out completely. Typical Lotka-Volterra behaviour
xi. Put in flow control setting of 2 throughout. Interpretation: curves go through 0, the Ecopath value and two times the base (*Zmax / Zbase*) Run: it will generally run OK.
xii. Try to increase vulnerability settings to 4, then 5 etc. See how far you can go and still get something sensible.
xiii. Do you have a sensible model? What would happen if you had no fishery. Shut the fishing down and set the run duration to 60-70 years to see how it will work for slow group. Reasonable result: should in general maintain all the groups we see today.
xiv. Now check how high you can go with the flow control vulnerability setting. It's harder now because the fishing is gone, so there are more top predators. This will help you get more reliable vulnerability settings. You need to have reasonable vulnerability settings before you can proceed.
xv. Turn the feeding time factor back on. This will change the feeding time, 1 can cause numerical instability. If this happens it will create violent oscillations and more groups may drop out. Try, e.g., 0.2 will change feeding behaviour with some 20% per month. If groups are still dropping out the foraging behaviour is slowing things down, so the the feeding time factor is not big enough. It tries to maintain the Q/B by changing foraging time.
xvi. Group Info: *Predator effective feeding time*. The target feeding time is set according to predator abundance. Setting the value to 1 means a group is willing to give up feeding if predation risk is high. Zero means the group is ignoring predation risk but feeds independently. Top predators may be reducing feeding due to parasite risk (often ignored predators). Try an intermediate value, e.g., 0.5.
xvii. Initially you may not have any idea of what values to use, so play, try it out.
xviii. What we have been doing? Trying to maintain the mass interaction model by adding behaviour to equation.
xix. Next, look at multi-stanza groups. Increase fishing heavily for 5-10 years, and then shut the fishery down. The juvenile groups should be hit hard.
xx. Open the Stock-Recruitment plot: There will often be erratic behaviour for short to medium- lived groups, and Beverton-Holt (BH) curves for long lived ones. If you don't see BH curves for long lived groups, something is likely to be wrong with your parameters.
xxi. Next use the forcing functions. Here's an experiment: change primary productivity over time using a forcing function and apply to phytoplankton (using Apply FF (primary producer)), and look at how it propagates up through the food web.
xxii. Use *Overlay* on the *Run Ecosim* form for an easy (sensitivity) check of how parameter values impact the results.