3.12 Compensatory mechanisms

Sustaining fisheries yield when fishing reduces stock size depends on the existence of compensatory improvements in per capita recruitment, growth, and/or natural mortality rates. Ecosim allows users to represent a variety of specific hypotheses about compensatory mechanisms. Broadly, these mechanisms fall in two categories:

- direct - changes caused over short time scales (order one year) by changes in behaviour of organisms, whether or not there is an ecosystem-scale change due to fishing; and
- indirect - changes over longer time scales due to ecosystem-scale responses such as increased prey densities and/or reduced predator densities. Usually we find the direct effects to be most important in explaining historical response data. In the next three sections we describe how to generate alternative models or hypotheses about direct compensatory responses; these hypotheses fall in three obvious categories: recruitment, growth and natural mortality.