

## NDF Support Tool – Life history trait relative vulnerability

Upper (top 33%) and lower (bottom 33%) thresholds were calculated for each of the ten life history traits individually and for every order based on all measurements available. Where species had multiple measures for a trait, the species mean was calculated for that trait first.

Species were assigned a **relative measure** for each trait based on how they compared to the thresholds:

- species in the top third of mean values recorded within the order (i.e. above the upper threshold) were assigned a relative measure of 'large size' (body size), 'many offspring' (reproductive output), 'long time' (age of maturity) or 'fast rate' (growth rate) depending on the trait;
- species in the middle third of mean values recorded within the order were classified as 'moderate' for the relevant trait; and
- species within the bottom third of mean values recorded within the order (i.e. below the lower threshold) were classified as having a 'small size' (body size), 'few offspring' (reproductive output), 'short time' (age of maturity) or 'slow rate' (growth rate).

**Relative vulnerability** indicates whether the relative measure is likely to make the species more or less vulnerable to over-harvesting based on their life history 'rate' (where they fall along the fast-slow life history continuum<sup>1,2</sup>). Species with a slower life history strategy tend to invest more in growth and reproduction; they are relatively larger, produce fewer offspring and take longer to reach reproductive maturity, as a result they are considered more vulnerable to overharvesting and are likely to take longer to recover.

The table below shows the relative vulnerability of the relative measures for each individual trait included in the NDF Support Tool. It also summarises the higher taxonomic groups for which data are available.

### Summary table of life history traits.

Trait	Relative vulnerability			Taxonomic coverage (where data are available)
	Low	Moderate	High	
<b>Body size</b>				
Body weight	Small size	Moderate size	Large size	Animals
Body length				Aquatic mammals, birds, amphibians (Gymnophiona and Caudata), fish, aquatic non-coral invertebrates, spiders
Snout-vent-length				Mammals, birds, reptiles, amphibians (Anura)
<b>Reproductive output</b>				
Number of offspring per reproductive event	Many offspring	Moderate offspring	Few offspring	Animals
Number of reproductive events per year				Animals
Number of offspring per year				Animals
<b>Age at maturity</b>				
Female age at maturity	Short time	Moderate time	Long time	Animals
Female age at first birth				Mammals
Plant age at maturity				Plants
<b>Growth rate</b>				
Growth rate	Fast rate	Moderate rate	Slow rate	Corals

<sup>1</sup> Hutchings, J.A., Myers, R.A., García, V.B., Lucifora, L.O. and Kuparinen, A., 2012. Life-history correlates of extinction risk and recovery potential. *Ecological Applications*, 22(4), pp.1061-1067.

<sup>2</sup> Bielby, J., Mace, G.M., Bininda-Emonds, O.R., Cardillo, M., Gittleman, J.L., Jones, K.E., Orme, C.D.L. and Purvis, A., 2007. The fast-slow continuum in mammalian life history: an empirical reevaluation. *The American Naturalist*, 169(6), pp.748-757.