**Limit reference point examples – MarinTrust approved whole fish fisheries**

Approaches to limit reference point:

- % unfished biomass: 27.5%, 25%, 20%, 15%, 8%
- stock-recruit: lowest biomass producing a good recruitment, or applying a break-point regression or Beverton-Holt SR model
- Biomass time series: lowest biomass in time series, or other low fixed value defined by time series

| Country | species / stock | Target / trigger ref points | Limit ref points | General type of approach to setting ref points |
|---|---|---|---|---|
| Chile | anchoveta, Araucaria herring (several stocks) | F 55% or 60% SPR 55/60% SPR or 55% $SB_0$ | 25% $SB_0$ or 27.5% $SB_0$ | % unfished biomass (F=0) |
| Chile | horse mackerel | Bmsy | Lowest historic SB relative to recent estimate of $SB_{F=0}$ – 8% | % unfished biomass |
| Denmark, Estonia, Finland, Latvia | Gulf of Riga herring | Fmsy, Bpa (average SB from SBs<=median but resulting in recruitment >=median) | Bpa / 1.4 | stock-recruit (empirical) |
| Denmark, Estonia, Finland, Latvia | sprat (several stocks) | Fmsy | SB resulting in 50% recruitment when BH stock-rec function is applied | stock-recruit (model) |
| Denmark | herring (several stocks) | Fmsy | 15%$B_0$ | % unfished biomass |
| Denmark, Norway | Norway pout, North Sea | B (prob. B<Blim < 5%); also max F (Fcap) = 0.7 | Bloss (lowest point in time series – 2005) | biomass time series |
| Denmark | sandeel, North Sea | Fcap – maximum F resulting in B>Blim with 95% probability | Blim – mean of two lowest SB estimates which resulted in recruitment > median | stock-recruit (empirical) |
| Denmark | sprat (several stocks) | Fcap – maximum F resulting in B>Blim with 95% probability (long-term) | Blim – breakpoint of hockey stick SR curve | stock-recruit (empirical) |
| Denmark | herring, North Sea | Fmsy | breakpoint of segmented regression of SR curve | stock-recruit (empirical) |
| Norway | capelin, Barents Sea | none | SB = 200 kt (Bescapement); lowest SB to produce a good year | stock-recruit (empirical) |

| | | | class (SB 1989). TAC set such that SB>Blim with 95% prob | |
|---|---|---|---|---|
| Panama | anchoveta, thread herring | 60% $B_0$ | 20% $B_0$ | % unfished biomass |
| Peru | anchoveta (south) | Bmsy, Fmsy (TAC fixed at 80% MSY) | ? | |
| Peru | anchoveta (north) | 5 million t, E<0.35 | 4 million t (empirical) | biomass time series |
| South Africa | sardine, anchovy | none per se | 'critical biomass' (fixed quantity, based on acoustic survey) | biomass time series |