

Scottish MPA Project Draft Fisheries Management Guidance
Orange Roughy (<i>Hoplostethus atlanticus</i>)
February 2014

Please note that this advice is currently in draft format pending external peer review, and so may be subject to change.

The draft fisheries management guidance has been produced to provide advice on the impact various fishing activities may have on MPA search features in Scotland's seas. The advice is organised by features and gear types. Fishing gears are grouped to combine those with broadly similar impacts, but where there is likely to be variation within a group of features (e.g. for high and low energy sand habitats), this has been taken into account. Where possible the guidance has been based on evidence from peer-reviewed scientific journals.

The advice on fisheries management falls into three broad categories:

- Gear/feature combinations that are unlikely to cause unacceptable impacts (except possibly at very high levels of effort) and so no additional management is likely to be required;
- Gear/feature combinations that are likely to cause unacceptable impacts and for which no possible mitigation measures could be identified at this stage other than closure to that gear;
- Gear/feature combinations that are likely to cause some degree of impacts but for which management may be possible to mitigate the effects (e.g. modification or restriction of certain gears, partial or temporary area closures, effort limitation).

In the last type of cases in particular, further site-specific evidence gathering and discussion with stakeholders will be required to determine the appropriate management measures.

The fisheries management guidance has been used, along with the FEatures Activities Sensitivities Tool (FEAST), to inform the development of management options papers for each possible MPA.

Document version control		
Version 0	Date prepared 05/04/2012 Sophie Elliott (JNCC) Revised by Tom Blasdale (13/04/2012)	
Version 0.1	S. Elliott 27/04/2012	Review and further drafts
Version 1.0	Tom Blasdale 13/02/2014	Incorporating changes from Marine Scotland Review

Orange Roughy (*Hoplostethus atlanticus*)

The orange roughy (*Hoplostethus atlanticus*) is a deepwater fish species, inhabiting continental slopes and seamounts at depths greater than 600m but mostly between 900 and 1700m (Bailey *et al.*, 2009). They form dense aggregations for spawning around topographic features such as rock pinnacles and seamounts. Outside of spawning aggregations, they are more widely distributed at lower densities around seamounts and along the continental slope. In Scottish waters adults orange roughy have been recorded from the Hebrides Terrace, Anton Dohrn and Rosemary Bank Seamount and throughout the continental slope south of the Wyville-Thompson Ridge. Juveniles have been caught in fishing surveys along the continental slope (ICES, 2010).

Orange roughy is a very slow-growing species with longevity of around 130 years (Alain and Lorange, 2000). They do not reach sexual maturity until around 28 years and have relatively low fecundity (Minto and Nolan, 2006). It also is likely that Orange Roughy do not all spawn every year (Annala *et al.*, 2003). All this leads to the conclusion of very high vulnerability to depletion by fisheries.

Impacts

Other demersal towed gear (trawling)

Due to their extreme longevity and slow adult growth rate, orange roughy can withstand only very low levels of fishing mortality. Trawl fisheries targeting aggregations can result in high mortality and rapid depletion.

In Scottish waters, orange roughy are known to have been caught in two distinct fisheries: a targeted trawl fishery on seamount aggregations and a mixed-species deepwater fishery on 'flat' grounds (ICES, 2010). The stock in ICES subarea VI (west of Scotland) was fished in the early 1990s by French trawlers targeting aggregations on the Hebrides Terrace Seamount (ICES, 2010). This resulted in a very rapid decline in landings and the stock is now considered to be severely depleted. It is likely to take decades for the stock to recover to a level where sustainable fisheries could occur.

Some bycatch occurs in mixed-species deepwater fisheries. This is hard to quantify as current CFP regulations prevent landing of this species, however sampling under the French observer programme suggests that discarding rates are not significant (ICES, 2010). It is not known whether current low levels of bycatch are sufficient to prevent recovery.

Demersal static gears (longline and gillnet)

Orange roughy are not caught by longlines (Gordon *et al.*, 2001). There is no evidence for catches by gillnetters but current CFP regulation prohibits the use of gillnets at depths greater than 600m so it is unlikely that any impact occurs.

JNCC/SNH advice

All towed (trawling)

At current low stock levels, the most recent ICES advice; *ICES recommends no directed fisheries for this species. Bycatches in mixed fisheries should be as low as possible* (ICES, 2012) is appropriate. The Total Allowable Catch in EU waters is currently set at zero and therefore no additional management should be required to prevent targeted fishing. If further

analysis of discard data shows areas of high bycatch in the mixed-species trawl fishery, restriction on mixed deepwater trawl fisheries may be required in areas where aggregations occur.

All static Gears (longlines, gillnets)

Orange roughy are not caught on longlines and there is no record of them having been taken by gillnets in Scottish waters. It is therefore not envisaged that any additional management will be required for these gears.

Confidence in advice

Demersal towed and static gear - High certainty. The conclusions are supported by evidence from ICES for deep waters around the UK.

Evidence

Allain & Lorange, 2000 ; Annala <i>et al.</i> , 2003; Bailey <i>et al.</i> , 2009; ICES, 2010; Gordon <i>et al.</i> , 2001; Minto & Nolan, 2006.							
There is good evidence for the demersal towed gear (trawling) on Orange roughy from ICES directly relating to Scottish waters.							
Advice and evidence of demersal static gear (longline) on Orange roughy has also been found which is relevant to Scottish waters.							
Directly relevant peer reviewed literature	✓	Directly relevant grey literature	✓	Inference from studies on comparable habitats, gears or geographical areas.		Expert judgement or anecdotal evidence	

Reference

Allain, V. and Lorange P. 2000. Age estimation and growth of some deep-sea fish from the Northeast Atlantic ocean. *Cybius* 24(3 suppl.): 7-16

Annala, J.H., Sullivan, K.J. O'Brien C.J., Smith N.W. McL & Grayling S.M. (comp.) 2003. Report from the fishery assessment plenary, May 2003: stock assessments and yield estimates. 616pp. Ministry of Fisheries. (Unpublished report held in NIWA Library, Wellington)

Bailey, D. M., Collins, M. A., Gordon, J. D. M., Zuur, A. F. Priede, I. G., 2009. Long-term changes in deep-water fish populations in the northeast Atlantic: a deeper reaching effect of fisheries? *Proc. R. Soc. B*

Gordon, J. D. M. Deep water demersal fisheries. <http://jncc.defra.gov.uk/page-2525> [accessed April 2012]

ICES 2010. Report of the ICES Advisory Committee, 2010. ICES Advice, 2010. Book 9 Widely Distributed and Migratory Stocks. 299 pp.
<http://www.ices.dk/committe/acom/comwork/report/2010/2010/Orange%20roughy.pdf>

Minto C and Nolan, CP 2006. Fecundity and Maturity of Orange Roughy (*Hoplostethus atlanticus* Collett 1889) on the Porcupine Bank, Northeast Atlantic. *Environmental Biology of Fishes*, 77(1), pp. 39-50.