White-Beaked Dolphin

Scientific name: *Lagenorhynchus albirostris*

Territorial/Offshore waters: Territorial\(^1\)

White-beaked dolphins are the second most frequently recorded cetacean around the UK (Evans, 1992). They grow up to 3.1 m in length and males are slightly larger than females. Their flippers are long and relatively broad and they have a tall and slightly falcate dorsal fin located in the middle of the back (Reeves *et al*., 1999b). The colour pattern is highly variable but they are primarily black to dark grey on the upper sides and back, and white to light grey on their belly and beak. Wisp-like pale grey coloration runs along the flanks, and a pale saddle patch is visible behind the dorsal fin (Reid *et al*., 2003).

Scottish shelf waters are considered to be the main stronghold of this species in Europe, particularly in the Minch, to the north of the Outer Hebrides, in the outer Moray Firth and off the coast of Aberdeenshire (Reid *et al*., 2003; Canning *et al*., 2005; Weir *et al*., 2007; Jefferson *et al*., 2008). White-beaked dolphins are the only cetacean species for which there is evidence of contracting range in Scottish waters (Macleod *et al*., 2005, 2007, 2008). Warming sea temperatures due to climate change means a contraction of their range northwards.

Functional Links

Functional links and associations with other Priority Marine Features

- **Risso’s dolphin; short-beaked common dolphin; bottlenose dolphin**: Risso’s dolphins (*Grampus griseus*) have been observed in mixed groups with white beaked dolphins in the areas north of Mull and the Small Isles, and also south of Skye and the Isle of Lewis (Jeewoonarain *et al*., 1999). A similar association is known with the short-beaked common dolphin (*Delphinus delphis*) and bottlenose dolphin (*Tursiops truncatus*). All species feed on similar prey items, including crustaceans and cephalopods, and so the interactions may be a product of prey species distributions (Atkinson *et al*., 1999; Culik, 2004).

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\(^1\) Although this species has a wider distribution, as an MPA search feature it is only being considered in territorial waters.
Functional links with wider Scottish marine ecosystem

Cooperative feeding between Atlantic white-sided and white-beaked dolphins has been described, with dolphins herding the fish into a tight cluster and trapping them against the surface (Reeves et al., 1999a, 1999b). Mixed pods of Atlantic white-sided dolphins and white-beaked dolphins have also been observed in the North Sea (Reeves et al., 1999a).

Stomach contents analysis has identified clupeids (e.g. herring), gadoids, e.g. Atlantic cod (Gradus morhua), haddock (Melanogrammus aeglefinus), poor-cod (Trisopterus minutus, T. luscus), whiting (Merlangius merlangus), capelin (Mallotus villosus) and hake (Merluccius merluccius) as the principal prey of white-beaked dolphins (Culik, 2010). Other species consumed include mackerel (Scomber scombrus), plaice (Pleuronectes platessa), dab (Limanda limanda), and sandeels (Hyperoplus spp. & Ammodytes spp.) as well as squid, octopus and benthic crustaceans (Reeves et al., 1999b).

Connectivity

White-beaked dolphins occur in cold temperate and sub-arctic waters, offshore and all over the continental shelf, particularly along the shelf edge. They appear to have a preference for waters shallower than 200 m (Reeves et al., 1999b). Critical habitats, e.g. important feeding, breeding or calving areas, are not known for this species. However, in Scotland, the greatest numbers of sightings occur from June to October (Reid et al., 2003) It has been suggested that births occur offshore in the northern North Sea (Evans, 1991), followed by a move to inshore nursery areas. Although no calving or nursery areas are known, calves have been observed in groups within coastal waters along the Aberdeenshire coast in June-August (Canning et al., 2005; Weir et al., 2007).

They are relatively fast swimmers (not as agile as common or striped dolphins) reaching speeds of about 6-12 km/hr, although they can achieve bursts of speed of about 30 km/hr (Evans & Smeenk, 2008).

Coherence

Population structure

White-beaked dolphins are most commonly seen in small groups of less than 30 animals, although much larger groups of 100-500 individuals have been recorded (Evans 1991; Kinze et al., 1997; Culik, 2010). Along the Aberdeenshire coast the average group size has been recorded as 4.6, rising to 5.9 when calves were present (Canning et al., 2005), with a calving peak during the summer months (Jefferson et al., 2008). Gestation lasts around 11 months, with most births thought to occur in late spring and summer, however, some have been estimated to occur in September and October (Evans & Smeenk, 2008). There appears to be segregation by age and sex with juvenile groups sometimes distinct from groups of adults with calves (Reeves et al., 1999b).

Maximum recorded age is 37 years (Kinze, 2009) and sexual maturity is reached at 13 years in males and 16 years in females (Reeves et al., 1999b).
Ecological variation across Scottish waters

This species is found mostly in continental shelf waters of depths between 50 m and 100 m and rarely out to the 200 m isobath (Northridge et al., 1997). Along the Aberdeenshire coast, most sightings were over depths of 20-30 m (Canning et al., 2005). Distribution has been strongly linked to sea-surface temperature (Canning et al., 2005; Weir et al., 2007), and is also affected by local primary productivity, depth and prey abundance (Weir et al., 2007; Scott et al., 2010). It is also thought that white-beaked dolphins exhibit an inshore movement in the summer months (Evans, 1992; Weir et al., 2007; Canning et al., 2008).

In Scottish waters, the species is most common in summer (June to September) although it is present throughout the year (Evans, 1992; Weir et al., 2007; Canning et al., 2008). Scottish shelf waters are considered to be the main stronghold for white-beaked dolphins in the UK and Europe (Canning et al., 2008).

Viability

Viability for mobile species is linked to the habitat upon which they depend e.g. areas important to feeding and breeding. In general, cetacean habitats vary temporally and spatially and are influenced by natural and anthropogenic factors (Ingram et al., 2007; Macleod et al., 2007; Weir et al., 2007). It is therefore often difficult to determine which features characterise these cetacean habitats and to quantify their extent. In addition, the annual variation caused by natural and anthropogenic factors makes specifying fixed areas for protection difficult. However, where specific areas are known to provide critical habitats and attract cetaceans with a high level of recurrence, area-based conservation measures may be suitable in protection of key feeding areas or where breeding aggregations occur.

A population estimate of 7,856 white-beaked dolphins was made in July 1994 for the North Sea and English Channel (Hammond et al., 1995) with a further estimate in the same area of 10,562 individuals in 2005 (SCANS II, 2008). Across a larger region including the North Sea and English Channel plus the east Atlantic and Irish Sea, the estimated abundance in 2005 was 22,664 (SCANS II, 2008).

The large extent of areas used by individual white-beaked dolphins means that protecting the full range of an entire viable population within an MPA is not feasible. The focus should be on the identification of critical habitats such as breeding and calving areas, and areas where animals are known to annually recur. These areas could then be targeted as a priority for protection.

Indicators of Least Damage/More Natural

Up to date information on the sensitivity of white-beaked dolphin to pressures associated with human activities are included in the Feature Activity Sensitivity Tool (FeAST; Marine Scotland, 2013).

Risk Assessment

The details of the assessment of risk for each MPA search feature is addressed in a separate report (Chaniotis et al., 2014). However, the assessment for this feature is still to be finalised.
Recovery Potential

Ecosystem changes
Reduction in prey items from important feeding areas (e.g. by fisheries) has the potential to impact energy budgets for species at higher trophic levels. It is unknown to what degree white-beaked dolphins are able to respond to a reduction in prey, e.g. through prey switching or moving to new foraging areas. However, considering the wide range of prey species taken by white-beaked dolphins, it is possible that they will be fairly resilient to changes in prey distributions.

Disturbance
Disturbance of cetaceans from vessel traffic has been shown to cause both short- and long-term avoidance behaviour, behavioural changes such as altered swimming speeds and diving rates, as well as physiological changes such as reduced reproductive success. Short-term impacts are not likely to cause significant damage; however, persistent and repetitive noise, or that with a long duration, could cause stress, debilitation and ultimately mortality (Simmonds et al., 2003). Increased vessel traffic can also lead to direct physical damage (e.g. through collisions and propeller damage) which can cause serious injury or death.

Pollution
Long-lived predatory species such as white-beaked dolphins are at risk of bioaccumulation of chemical pollutants such as organochlorines, polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), perfluorochemicals (PFCs), flame retardants such as polybrominated diphenyl ethers (PBDEs) and anti-fouling agents. These contaminants and heavy metals can cause a reduction in reproductive potential or lead to immune suppression and subsequent increases in disease in cetacean species (Reijnders, 1996; Cármara Pellissó et al., 2008).

Climate change
Indirect effects on prey species have not been quantified, and the effects of any change in ocean temperature on the distribution of white-beaked dolphins’ prey are unknown. White-beaked dolphins are a northern species, characteristic of cold temperate to sub-polar waters, and it is possible that their range may become more restricted with increasing water temperatures (Macleod et al., 2008).
Geographical Variation

Scottish shelf waters are considered to be the main stronghold of white-beaked dolphin in Europe, particularly in the Minch and to the north of the Outer Hebrides, in the outer Moray Firth and off the Aberdeenshire coast (Reid et al., 2003; Canning et al., 2005; Weir et al., 2007; Jefferson et al., 2008).

Geographical context

The white-beaked dolphin is common in UK and Irish waters, occurring most abundantly in the central and northern North Sea across to north-west Scotland (Reid et al., 2003). It occurs over a large part of the northern European continental shelf, its distribution extending northwards to Iceland, the Greenland Sea and central-west Greenland (Reid et al., 2003). It is also found in the western North Atlantic, such as at Cape Cod. It occurs only occasionally around southern England, southern Ireland and in the Irish Sea (Reid et al., 2003). There are also a small number of sightings from the Bay of Biscay, Spain, Portugal and the Mediterranean approaches (Reeves et al., 1999b).
References


