A3a.5 MARINE REPTILES

Although not indigenous to the United Kingdom, sea turtles (family Cheloniidae) represent the only marine reptiles to be found in UK waters. There are seven species of marine turtle, five of which have been recorded in UK waters. These are the leatherback turtle (*Dermochelys coriacea)* loggerhead turtle (*Caretta caretta*), Kemp's ridley turtle (*Lepidochelys kempii*), green turtle (*Chelonia mydas*) and hawksbill turtle (*Eretmochelys imbricata*).

Bycatch, strandings and sightings data for turtles are recorded by various organisations throughout the UK and Eire; these are compiled and held in the TURTLE database (described by Pierpoint & Penrose 2002). Annual reports of records submitted to the TURTLE database have been published since 2002 (Penrose 2002, 2003, 2004, 2005; Penrose & Gander 2006, 2007, 2008). Records from 1960-1999 are summarised by Pierpoint & Penrose (2002).

A3a.5.1 Distribution and abundance

Of the five species recorded in UK waters, the vast majority of records (*ca*. 80%) are of the leatherback turtle. This species exhibits physiological adaptations which allow it to function in temperate waters, and is the only species of marine reptile to be considered a regular member of the UK marine fauna.

The appearance of most cheloniid species in UK waters is thought to be accidental, but the movement of leatherbacks is mostly regarded as a deliberate migration in response to food distribution, notably jellyfish (Houghton *et al*. 2006). This species may be at the extreme (northern) limit of its range in UK waters. Hays *et al*. (2004) monitored the pan-oceanic migration of the leatherback turtle in the Atlantic and reported extensive movements. The nesting beaches of turtles present in British waters are in the tropics and sub-tropics (eastern American mainland coast and Caribbean islands).

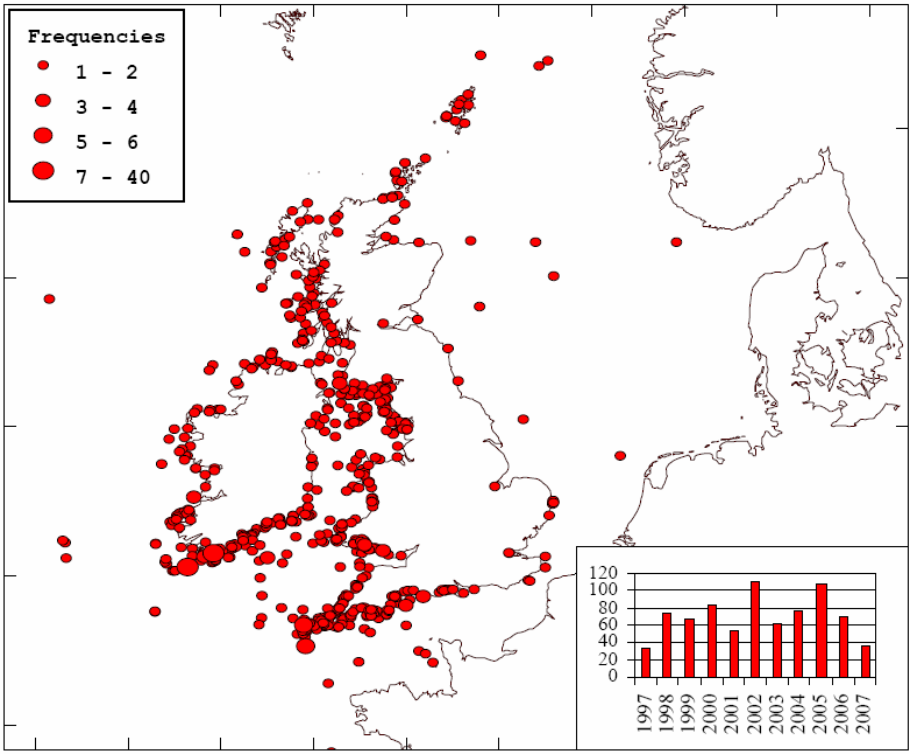
Two other species recorded in the database, loggerhead turtle and Kemp's ridley turtle, are infrequent while records of green and hawksbill turtles are extremely rare; these are all considered vagrants in UK waters (JNCC 2007).

Penrose & Gander (2008) summarise records of sightings and strandings of marine turtles around the UK and Eire from 1997-2007 (Figure A3a.5.1). While data from 1960-2007 show that turtles have been observed along the majority of UK and Irish coasts, records are concentrated on the west and south coasts of Eire, southwest England, south and northwest Wales, the west coast of Scotland, Orkney and Shetland.

The majority of turtle sightings are therefore concentrated in Regional Sea Areas 4, 5 and 6. This may reflect patterns of movement from the west to the east coast of Britain through the Irish Sea, Scottish waters and to a lesser extent the English Channel following the warmer waters and jellyfish pockets (Pierpoint & Penrose 2002).

For the UK and Eire as a whole, the majority of leatherback turtle sightings occur from June-October, with a peak in August; strandings peak slightly later in September and October (Pierpoint 2000). The timing of sightings throughout UK waters implies that leatherbacks move into British and Irish waters from the south and west, passing northwards up western coasts and the Irish Sea which can bring them through Regional Sea 8 during the summer months and through to the central North Sea in the autumn. Total sightings and strandings throughout the UKCS are listed in Table A3a.5.1 by Regional Sea Area.

Figure A3a.5.1 – Distribution of records of all turtle species from 1997-2007



Note: includes sightings and strandings (live and dead). Source: Penrose & Gander (2008)

Table A3a.5.1 – Turtle sightings and strandings by Regional Sea 2001-2007

Regional Sea Area	Sightings and strandings (all species)
1	7
2	8
3	9
4/5	114
6	109
7	29
8	31
9	0
10	0
11	0

Source: Penrose & Gander (2006, 2007 & 2008) and Penrose (2002, 2003, 2004 & 2005).

A3a.5.2 Evolution of the baseline

The distribution of the leatherback turtle seems to be influenced by sea surface temperature and food abundance. McMahon & Hays (2006) describes the position of the 15°C surface isotherm as effectively encapsulating the range of this species. They show that while inter-annual variation in the average summer position of the 15°C isotherm across the North Atlantic is considerable, there was a general trend of increasing latitude over the period 1985-2002, with a northwards shift of 330km over this period (McMahon & Hays 2006). As there is now wide ranging acceptance that global temperatures are increasing and likely to

continue to do so for the foreseeable future, further northward movement of the 15°C surface isotherm is expected.

Food availability is also understood to be an important influence. Houghton *et al.* (2006) linked leatherback sightings to the distribution of jellyfish species such as *Rhizostoma* and any change in the availability and distribution of gelatinious zooplankton could affect turtle distribution. Fluctuations of pelagic cnidarians and ctenophore abundance have been shown to correlate with environmental variables (Purcell *at al.* 2007) and the abundance of the majority of moderate-temperature species studied has been reported to increase in warmer waters. As the oceans continue to warm over the next several decades the abundance of gelatinous species is expected to increase and population distributions to shift poleward (Purcell *at al.* 2007).

An increase in jellyfish abundance in the UKCS and northward shift in their distribution with warmer seas would likely result in leatherback sightings, bycatch and strandings incidences increasing. Such increases should be most noticeable along the southern coasts of the UK and Ireland, through the Celtic and Irish Seas and, to a lesser extent, the more northerly Regional Sea Areas. Any northward movement of the 15°C isotherm will impact the waters of RSA 4 prior to other regions and so initial increases in turtle sightings, strandings and by-catch would be expected to be seen here first. This does assume that the population of this wide-ranging species does not decline due to other pressures, such as impacts at their breeding sites or in more southerly parts of their foraging range.

A3a.5.3 Environmental issues

A3a.5.3.1 Marine litter

Plastic can persist for many centuries and is sometimes mistaken for prey species by turtles. Once ingested, plastic can block a turtle's digestive track leading to starvation or reduce the animal's desire to feed if the plastic fills the gut to leave the animal sated without providing any nutritional value. Many plastics contain harmful organochloride compounds such as PCBs which, once ingested, can damage reproduction and the animals' ability to resist disease. Plastics can also contain air bubbles which prevent turtles from diving for prey items.

A3a.5.3.2 Boat collisions

Turtles must surface regularly to breath and can often be seen basking or resting on the surface. These activities leave them vulnerable to boat strikes and propeller injuries.

A3a.5.3.3 Fishing gear

Long term studies on the incidental catching of turtles on long lines has shown that, though some turtles may be incidentally snagged on the hooks, most are hooked in the oesophagous, stomach or mouth as they swallow the fish bait. In the case of trawl/drift-nets, the turtles are either "scooped-up" by the net or become entangled. Death normally occurs due to drowning. Even if the turtle is not dead when discarded it can often die as a result of anoxic brain damage. Turtles can also become entangled in discarded fishing gear. In UK waters most records of leatherback bycatch implicate entanglement in ropes, particularly those used to tether marker buoys in pot fisheries for lobster, crab and whelk. Since 1980, these fisheries have accounted for around 62% of reported bycatch (for which gear type is known) (Pierpoint 2000).

A3a.5.4 Conservation frameworks

All sea turtles are regarded as globally threatened and legislative measures are in place to protect marine turtles occurring in UK waters as well as to control the illegal trade of individuals and their by-products. All species are listed on Appendix I of the Convention on the International Trade in Endangered Species of Flora and Fauna (CITES) 1975 (now enforced by Council Regulation (EC) No 338/97), Appendix II of the Bern Convention 1979, Appendices I and II of the Bonn Convention 1979 and Annex IV of the EC Habitats Directive. The loggerhead turtle is also listed as a priority species on Annex II of the EC Habitats Directive. All five species recorded in UK waters receive full protection under Schedule 5 of the Wildlife and Countryside Act 1981 as amended, which prohibits intentional or reckless killing, injuring or taking (capture); possession; intentional or reckless disturbance whilst occupying a place used for shelter and protection from destruction of these places.

The Conservation (Natural habitats, &c) Regulations (1994) make it an offence to deliberately capture, kill or disturb sea turtles, other than for the purpose of tending them or enabling their subsequent release.

In the UK all five species are included in both species specific and a grouped Species Action Plan for marine turtles. Various Local Biodiversity Action Plans exist for individual species.

The following summarises UK legislation pertaining to marine turtles and their protection:

- Wildlife and Countryside Act (1981, as amended)
- Conservation (Natural Habitats, &c.) Regulations (1994)
- Control of Trade in Endangered Species (Enforcement) Regulations (1997)
- The UK Biodiversity Action Plan for Turtles (1999)
- The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007

Turtles are also protected under several pieces of international legislation for the protection of animals:

- EC Habitats and Species Directive 1992
- Convention on the International Trade in Endangered Species 1975
- Council Regulation (EC) No. 338/97
- Conservation of European Wildlife and Habitats 1979
- Convention on the Conservation of Migratory Species of Wild Animal 1980