

Agenda Item 4

Special Species Session: Atlantic White-Sided Dolphin

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Background Paper on Atlantic White Sided Dolphin (Evans & Smeenk 2008)

Action Requested

- Take note

Submitted by

Evans & Smeenk



**NOTE:
DELEGATES ARE KINDLY REMINDED
TO BRING THEIR OWN COPIES OF DOCUMENTS TO THE MEETING**

Secretariat's Note

The Rules of Procedure adopted at the ASCOBANS 8th Meeting of Parties remain in force until and unless an amendment is called for and adopted.

Analyses of stomach contents, North Sea and Newfoundland, reveal cod *Gadus morhua*, whiting *Merlangius merlangus* and hake *Merluccius merluccius* as dominant prey [1, 340, 630, 970, 1032] [324, 428, 1101].

Feeding methods: Herds fish cooperatively. Groups seen hunting in a broad front, dolphins swimming parallel to each other at regular distances; fish shoals then encircled and trapped near the surface. Seabirds, particularly northern gannet, kittiwake, and other gull species often closely associate with feeding white-beaked dolphin groups [1, 341, 342].

BREEDING

Data limited. Births mainly in late spring-summer (May–August), with some in September–October [340, 346, 360, 408, 630, 970]. Gestation period c. 10–11 months. Lactation period, calving interval and age at sexual maturity unknown. 3 pregnant animals, Newfoundland, at least 7 years old [324].

POPULATION

SCANS I survey, North Sea and adjacent waters, June–July 1994, gave estimate of 7856 (95% CI 4032–13 301) white-beaked dolphins, or of 11 760 (95% CI 5587–18 528) combining white-beaked and unidentified *Lagenorhynchus* (great majority probably white-beaked). All records were from North Sea and directly NW of Scotland, between c. 54–60° N, 6° W–7° E [481]. Repeat survey (SCANS II), July 2005, covering a wider area (continental shelf seas from SW Norway, S to Atlantic Portugal), gave estimate of 22 700 (CV = 0.42) [478].

MORTALITY

Observed fleeing from pod of killer whales; frequently have scars thought to be caused by sharks and killer whales, but direct evidence of predation lacking [340, 970, 353]. Longevity at least 32 years (males) and 39 years (females) [413]. No information on mortality rates.

PARASITES AND PATHOGENS

2 whale-lice recorded: *Scutocyamus parvus* found on animals from North Sea; unknown from other dolphin species; a few records of *Isocyamus delphinii*, also from North Sea [1, 401].

Endoparasites: Nematodes *Anisakis simplex* (digestive tract) and *Halocercus lagenorhynchi* (bronchi) [170, 324, 441, 1065]; also *Pseudoterranova* sp. (stomach) [64], with trematode *Pholeter gastrophilus* also found [442].

Dystocia (birth trauma in mother, rather uncommon in other dolphins) found several times

[424, 631]. Pneumonia occasional [424, 631]; in 1 animal stranded on Dutch coast, dystocia was associated with morbillivirus, in another with rhabdovirus [630, 885]; morbilli- and rhabdovirus also found in other animals from Dutch coast; 1 stranded in Suffolk had antibodies to morbillivirus [173]. Poxvirus in the skin reported [88]. Diseased jaws and teeth frequent in older animals [646, 970]. Discarthrosis (spondylosis deformans) and spondyloarthritis (spondyloarthropathy: reactive arthritis of the vertebrae) much more common in white-beaked dolphins than in other cetaceans; in one study, discarthrosis reported in 54% of 22 adult females and in 42% of 7 males [646–648]. A few animals found with kyphosis (S-shaped vertebral column) [646, 970]

RELATIONS WITH HUMANS

Organochlorine levels in blubber, kidney and muscle of 27 white-beaked dolphins from Newfoundland were high, considering that all <7 years old; also high levels of lead in kidney, liver and muscle. May have been overwintering in highly polluted Gulf of St. Lawrence [817]. Organochlorine levels in animals from GB generally low [770], as also in Denmark [50], E USA [619], although sample sizes small. Except for lead, heavy metals examined in an adult female, Liverpool Bay, also low [671a, 672]; same true for 7 stranded along Belgian and N French coasts [294].

Other threats poorly known, although small numbers reported bycaught from midwater trawls and driftnets set mainly for cod, mackerel, salmon or herring [347, 855].

Legally protected in European, British and Irish waters (Table 12.1).

LITERATURE

Most recent scientific review [970].

AUTHORS

P.G.H. Evans & C.S. Smeenk

GENUS *Leucopleurus*

Included in *Lagenorhynchus* by most authors, but molecular and genetic evidence argue for separation (see below). Since *L. albirostris* is type species for *Lagenorhynchus*, the generic name *Leucopleurus* (Gray 1866) is applicable to *L. acutus*.

Atlantic white-sided dolphin *Leucopleurus acutus*

Delphinus (Grampus) acutus Gray, 1828; type locality probably North Sea.

Deilf-chliathaich-ghil (Scottish Gaelic); *deilf le cliathán bán* (Irish Gaelic).

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RECOGNITION

Similar to white-beaked dolphin but somewhat smaller. Large, robust dolphin (Plate 16) with short beak, black back; distinctive long, white patch on flanks; narrow, yellow-ochre band extending backwards on tail stock. Large, sickle-shaped dorsal fin, centrally placed. Flippers smaller, much more clearly sickle-shaped than in white-beaked dolphin, with strongly curved front margin. Skull smaller, narrower, with more but smaller teeth.

DESCRIPTION

Stout, torpedo-shaped body, rounded snout with short (*c.* 5 cm) beak. Black on back including tail, top of head and upper jaw; dark grey flanks and side of head; long and narrow, sharply demarcated white patch on flanks from below front edge of dorsal fin to about halfway between dorsal fin and tail (Fig. 12.29), but not extending over back (as often in white-beaked dolphin). Sharply demarcated, long, narrow yellow-ochre band extending on to tail stock, starting as a thin line above the white flank patch and widening towards the tail, set off from grey flanks below by a black line originating from the tail stock. White belly and lower jaw. Flippers pointed and strongly re-curved, black; narrow dark stripe extends from angle of mouth to flipper insertion. Black eye patch, from which a thin black line extends forward to the dark upper jaw, and very thin black line from eye patch to ear opening (not visible in the field). Clearly demarcated black patch around

genital/anal opening. Relatively tall (*c.* 12% body length), centrally placed, sickle-shaped dorsal fin. Very high tail stock, parallel-sided, particularly in adult males, in which it suddenly narrows close to the slightly notched tail flukes, which have a concave trailing edge.

Adult skull smaller and narrower than in white-beaked dolphin, with narrower and only slightly tapering rostrum and with more (29–40) and smaller (*c.* 4 mm diameter) teeth. Lachrymal long and narrow, extending far backward below frontal. Ramus of lower jaw low, upper margin behind tooth row nearly horizontal over about 2/3 of its length, no pronounced coronoid process. Scapula only slightly broader than high, with nearly straight hind margin. Upper process (acromion) directed more or less upward, ventral margin of lower process (coracoid) not or only slightly projecting below glenoid fossa (joint socket). Flipper skeleton strongly curved, particularly the radius; combined width of radius/ulna at the distal end greater than height of radius [1, 112, 800, 969, 970].

RELATIONSHIPS

Previously thought closely related to white-beaked dolphin *Lagenorhynchus albirostris*, and thus placed in same genus. Cytochrome *b* sequences indicate that not closely related, best placed in separate genera [684]. Corroborated by considerable skeletal differences, and occurrence of seemingly unique ectoparasite on white-beaked dolphin (see above).



Fig. 12.29 Atlantic white-sided dolphins rolling, to show distinctive white and yellow-ochre band on flanks. (photo P.H.G. Evans).

MEASUREMENTS

Length: newborn 108–122 cm; at sexual maturity 2.0–2.2 m (female), 2.3–2.4 m (male); adult, generally 210–240 cm (female), 210–260 cm (male); max. *c.*253 cm (female), *c.*274 cm (male). Weight: newborn *c.*25 kg; max 182 kg (female), 234 kg (male) [8, 1007, 1066].

VARIATION

No differences in skull characters between specimens from E and W Atlantic [783].

DISTRIBUTION

Restricted to N North Atlantic, mainly in offshore waters, from SW Greenland, Iceland and W Barents Sea S to Virginia (USA) and the Bay of Biscay. Less common than white-beaked dolphin on European continental shelf [346, 360, 481, 858, 876, 973]. Off British Isles, concentrated around

Hebrides, N Isles and N North Sea, but extends S along Atlantic seaboard, mainly outside or near the continental shelf (*c.*200 m depth), W and S of Ireland and Bay of Biscay; rare in the Irish Sea, English Channel and S North Sea (Fig. 12.30) [279, 340, 346, 360, 630, 688, 858, 969, 973, 1236].

HISTORY

No fossil or archaeological material known.

HABITAT

More pelagic than white-beaked dolphin, occurring mainly along edges or seaward of continental shelves, over depths of 100–300 m. Sometimes comes on to continental shelf, may enter fjords and inlets with depths <50 m. From Sea Watch database, 75% of sightings in NW European seas recorded at SSTs of 7–13 °C (total range including outliers 6–17.5 °C) [54]. In

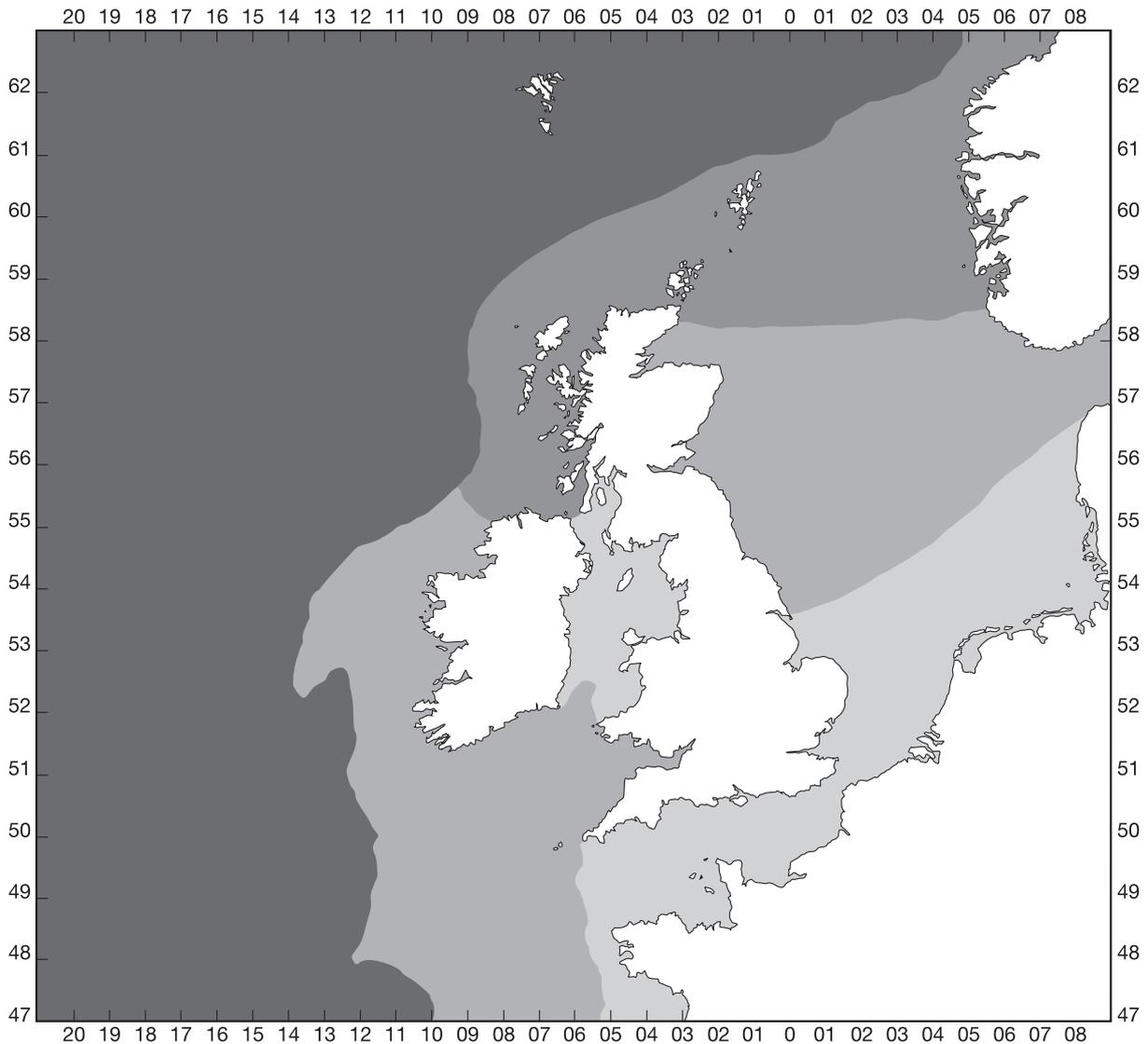


Fig. 12.30 Atlantic white-sided dolphin *Leucopleurus acutus*: distribution around British Isles.

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European seas, occur mainly in SSTs of *c.* 7–12 °C [360]. In E USA, occupies waters of 1–13 °C in spring and autumn, but most occur in waters of *c.* 5–11 °C [1059].

SOCIAL ORGANISATION AND BEHAVIOUR

Very gregarious; groups in E North Atlantic frequently 10s–100s, particularly offshore [340, 346, 360]. Groups up to 1000 recorded on American continental shelf and at shelf edge W and S of Ireland [688, 969]. Within large aggregations, subgroups of 2–15 animals may be distinguished [148, 353, 428, 467, 688]. Groups include both sexes, ages mixed, but possibly with some age segregation, since in 2 mass strandings, immatures aged 3–6 years (assuming 1 dentinal growth layer = 1 year) were absent from breeding groups consisting of adults and calves [1007, 1066]. However, immatures found with adults in bycatches W and S of Ireland [8]. Otherwise, social structure poorly known.

Fast swimmer, travelling over long distances at 14 km/h [760]. Bow-rides occasionally. Frequently breaches, though not as much as white-beaked, bottlenose or common dolphins. Mixed herds frequently formed with white-beaked dolphins, less often with bottlenose and common dolphins; sometimes associate with long-finned pilot whales, northern bottlenose whales, sperm whales, fin whales, and humpback whales [148, 213, 457, 467, 606, 969].

Vocalisations: Include whistles of 7–16 kHz frequency, with mean peak frequencies of 8–12 kHz, and mean duration 0.5 s, and broadband echolocation clicks at 0.2–180 kHz with peak frequencies of 60–80 kHz and single pulse duration of 0.25–1 ms [1204].

FEEDING

Diet: Wide variety of fish (including *Clupea*, *Osmerus*, *Gadus*, *Merlangius*, *Micromesistius*, *Trisopterus*, *Merluccius*, *Scomber* and Salmonidae), squid (*Illex*, *Loligo*) and shrimps [1, 304, 340, 427, 969, 1066, 1101, 1195].

Stomachs of 17 animals in a mass stranding, Co. Mayo, Ireland, September 1994, contained otoliths of gadoid fishes including *Trisopterus* sp., herring *Clupea harengus*, horse mackerel (scad) *Trachurus trachurus*, as well as an argentine *Argentina sphyraena* and a squid beak [1007]. Stomachs of 50 white-sided dolphins from bycatch of Dutch mesopelagic trawl fishery for mackerel and horse-mackerel, 1992–1994, at shelf edge (near 200 m depth contour) W and S of Ireland, revealed mainly mackerel *Scomber scombrus* (67% prey weight) and Gadidae (mainly silvery pout

Gadiculus argenteus: 9% prey weight), various other fish including lantern fish *Notoscopelus kroeyerii*, and cephalopods (13% prey weight, at least 12 species). Nearly all collected in February–March, when mackerel arrive in the area on southward migration, probably attracting white-sided dolphins from deeper waters. One animal, same area, September, showed Gadidae (45% prey weight: mainly silvery pout and blue whiting *Micromesistius poutassou*) and cephalopods (52% prey weight: nearly all Ommastrephidae). In all cases, horse-mackerel was conspicuously absent from stomachs, despite being important target of Dutch fisheries [279, 280].

Feeding methods: Small groups frequently seen herding fish by surface-rushing in a crescent-shaped configuration [353, 688].

BREEDING

Data limited. Births mainly late spring–summer (May–August) [340, 358, 408, 969, 1066], sometimes as early as February and as late as September [8, 1007]. Gestation period *c.* 11 months [1007, 1066]. Lactation period *c.* 18 months [1066]. Calving interval 2–3 years, some animals being both lactating and pregnant [1007, 1114]. Age at sexual maturity 7–11 years (males) and 6–12 years (females), assuming 1 dentine layer/year [8, 1066].

POPULATION

No comprehensive population estimates; estimate of 5587–18 528 *Lagenorhynchus* includes an unknown proportion of white-sided dolphins [481]. Most commonly observed over GB continental shelf July–September; apparently concentrated in deep waters off shelf edge November–May [340, 346, 360, 688, 857, 858, 973].

Greatest number of dentine layers reported so far is 27 in a female, implying age of at least 27 years, and 22 in a male [1066]. Population structure unknown.

MORTALITY

Sharks and killer whales are likely predators, but no attacks reported.

PARASITES AND PATHOGENS

Internal parasites (with body locations where known) found in stranded specimens [79, 131, 438, 441, 442, 1007, 1195] include:

Trematodes: *Pholeter gastrophilus* (stomach and duodenum), *Oschmarinella laevicaecum* (bile ducts and hepatopancreatic ducts).

Cestodes: *Tetrabothrius forsteri* (upper intestine),

Phyllobothrium delphini (blubber), *Strobilocephalus triangularis*, *Monorygma grimaldii* (abdomen, peritoneum and testes).

Nematodes: *Anisakis simplex* (trachea and stomach), *Stenurus globicephalae* (stomach and cranial sinuses), *Crassicauda grampicola* (subcutaneous tissue, mammary glands, see below), *Crassicauda* sp. (subcutaneous tissue; frequently observed, with over 50% of the animals affected in some studies [424, 437, 438, 1007]), *Pseudalius inflexus* (bronchi and lungs), *Torynurus convolutus* (head sinuses), and *Bolbosoma* sp. (intestine).

In 2 mass strandings, Maine (USA), September 1974 and Ireland, September 1994, high incidence of parasitic mastitis caused by the nematode *Crassicauda grampicola* [437, 438, 1007]: 14/30 females in Maine, 5/7 adult females in Ireland, also recorded in bycatch victims [424]. Can severely damage the mammary glands and thus affect milk production [438]. From Irish stranding, neoplasia found in 3/19 animals; 2 cases of benign intestinal leiomyomas and 1 of intestinal fibroma [1007]. In Maine, 4/41 animals had various papillomas, 5 had intestinal leiomyomas. Adrenal lesions such as nodular hyperplasia and cyst formation were found in 20/23 females (and in 1 male) of Maine sample [437]. 2 cases of adrenal adenoma [438]. *Brucella* sp. isolated from a male stranded, Scotland [399].

RELATIONS WITH HUMANS

Not hunted commercially, though taken opportunistically by drive fisheries for small whales in Faroes, up to 500 taken some years [141], formerly also in Norway and Canada. Probably hunted in small numbers off SW Greenland [502]. Incidental mortality in fishing gear reported from British Isles, Ireland and Canada [279, 347, 969]. Numerous in bycatches from former Dutch trawl fishery for mackerel and horse-mackerel near the shelf edge W and S of Ireland. About 90% of this mortality in February–March [279].

Few examined for pollutants, and few details given (e.g. [158, 294]). 17 animals from mass stranding, Ireland, and 5 stranded, Scotland, analysed for chlorobiphenyls (CBs) and organochlorine pesticides [660, 770]. Levels generally low, but 2 adult males had CB levels of >40 and >60 µg/g in blubber. Similar concentrations in 2 bycaught males (1 adult) from Canada. Some of Irish animals also had relatively high levels of pesticides, particularly *p,p'*-DDE, dieldrin and HCB, as had the 2 males from Canada [660, 770]. Juvenile stranded, NW Ireland, had a high concentration (44 µg/g wet weight) of mercury in the liver [672], much higher than in

adult male from Canada [660]. High levels of cadmium in the kidneys of 2 stranded, Belgium, perhaps related to diet [294].

Legally protected in European, British and Irish waters (Table 12.1).

LITERATURE

Good review [969], brief popular overview [245].

AUTHORS

P.G.H. Evans & C.S. Smeenk

GENUS *Lagenodelphis*

Described by Fraser in 1956 from a skeleton brought back from Sarawak over 50 years previously, holotype in NHM, London; external morphology and colour pattern not described until early 1970s [916]; a monospecific genus, intermediate between *Lagenorhynchus* and *Delphinus* in characters.

Fraser's dolphin *Lagenodelphis hosei*

Lagenodelphis hosei Fraser, 1956; mouth of Lutong R., Baram, Borneo.

RECOGNITION

Small, stocky dolphin with a short but distinct beak, small flippers and dorsal fin (Plate 16). Deep palatal grooves; 34–44 teeth in each jaw. Usually in groups, frequently leaps clear of water, showing dark grey to black back, grey flanks and white to pink belly with broad darker stripes from beak to flipper and from eye to genital area. At a distance, eye-to-anus stripe may resemble striped dolphin, and not always visible, but body shape distinctive.

DESCRIPTION

Small dolphin with very short beak (3–6 cm), general shape not as slender as *Delphinus* sp. but not as stocky as *Lagenorhynchus* sp. Forehead slopes gradually to short beak; 34–44 pointed teeth in each jaw; deep palatal grooves. Small flippers; small pointed subtriangular dorsal fin, placed centrally on back. Coloration variable [918]: grey-brown back and appendages, pale grey flanks separated from whitish or pinkish belly by a thick dark stripe running from eye to genital area (although dark stripe sometimes missing on juveniles), giving appearance of 'masked' dolphin (possibly a feature of adult males). Sometimes another dark thick stripe from beak to flipper, but both dark stripes may be faint or absent in some populations. Dorsal fin slightly falcate in calves and females, more erect or canted in adult males. Similarly, postanal hump either absent or slight in females and young, well developed in adult males.