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Review

Risso's dolphin *Grampus griseus* in the Mediterranean Sea

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ABSTRACT

The ecology and status of Risso's dolphins *Grampus griseus* worldwide are poorly known. In the Mediterranean Sea, modern field studies of cetaceans only began in the late 1980s and this has resulted in rapid advances in knowledge of some species, but not Risso's dolphin. This paper reviews available information on the distribution and ecology of Risso's dolphins in the Mediterranean and identifies factors that may negatively affect them in this region. Risso's dolphins occur in continental slope waters throughout the Mediterranean basin and around many of the region's offshore islands and archipelagos. No synoptic estimate of abundance is available for the Mediterranean region, but densities and overall numbers are low in comparison to some other small odontocetes. Diet consists primarily of cephalopods, with a clear preference for mesopelagic squid. The principal known threat to populations in the Mediterranean is entanglement in pelagic drift gillnets. Other potential problems for Risso's dolphins in the Mediterranean include noise disturbance and ingestion of plastic debris. Conservation actions to mitigate the risk of entanglement in fishing gear are likely to benefit Risso's dolphins; specifically, the existing driftnet ban in EU waters should be strictly enforced and extended to the high seas and to waters under non-EU State jurisdiction. More and better data are needed on abundance, distribution, movements, population dynamics and trends in Risso's dolphin populations, and better information on threats (e.g. bycatch in fishing gear) is needed to inform conservation efforts.

Introduction

Risso's dolphin *Grampus griseus* (Fig. 1) has been studied in several locations around the world, but information on this cetacean species remains relatively scant. Risso's dolphins are not particularly shy or elusive and can be studied with relative ease in areas where continental slope waters are close to shore. In the Mediterranean Sea they are relatively widespread (Gaspari and Natoli, 2006) but not abundant and their occurrence can be unpredictable, possibly due to wide-ranging movements. This factor, together with generally low densities, has precluded sustained, focussed investigations of their ecology and behaviour. Even within the few Mediterranean areas where Risso's dolphins are known to be consistently present, however, only limited information has been obtained. In large parts of the region there is nothing more than a few sightings or strandings to indicate their presence. In sum, the distribution, ecology, status and trends of this species in the Mediterranean remain somewhat mysterious. On one hand this hampers conservation, but on the other hand it offers scope for novel studies.

In the Mediterranean Sea, modern field studies of cetaceans began in the late 1980s (Notarbartolo di Sciara and Bearzi, 2005) and this has resulted in rapid advances in knowledge of several of the species known to occur regularly in the region (Reeves and Notarbartolo di Sciara, 2006). Comprehensive reviews have been published on the fin whale *Balaenoptera physalus* (Notarbartolo di Sciara et al., 2008a,b), the common bottlenose dolphin *Tursiops truncatus* (Bearzi et al., 2008), the short-beaked common dolphin *Delphinus delphis* (Bearzi et al., 2003) and the striped dolphin *Stenella coeruleoalba* (Aguilar, 2000). In addition, shorter accounts are available for species that are rare or have a restricted geographic distribution, such as the killer whale *Orcinus orca* (Notarbartolo di Sciara, 1987) and the harbour porpoise *Phocoena phocoena* (Frantzis et al., 2001; Rosel et al., 2003). The Risso's dolphin, however, remains one of the least-known cetacean species in the region and has been the subject of few dedicated studies. A regional IUCN Red List workshop in March 2006 concluded that the Mediterranean subpopulation is Data Deficient (Gaspari and Natoli, 2006).

The literature on Risso's dolphins in the Mediterranean is limited and the available information includes a number of contributions that have not been formally peer-reviewed. Such 'grey' literature was used only sparingly and selectively for this paper. Literature from non-Mediterranean areas was assessed and summarised to include the wider global context, integrate regional knowledge and allow comparative insight. One of the main purposes of this review

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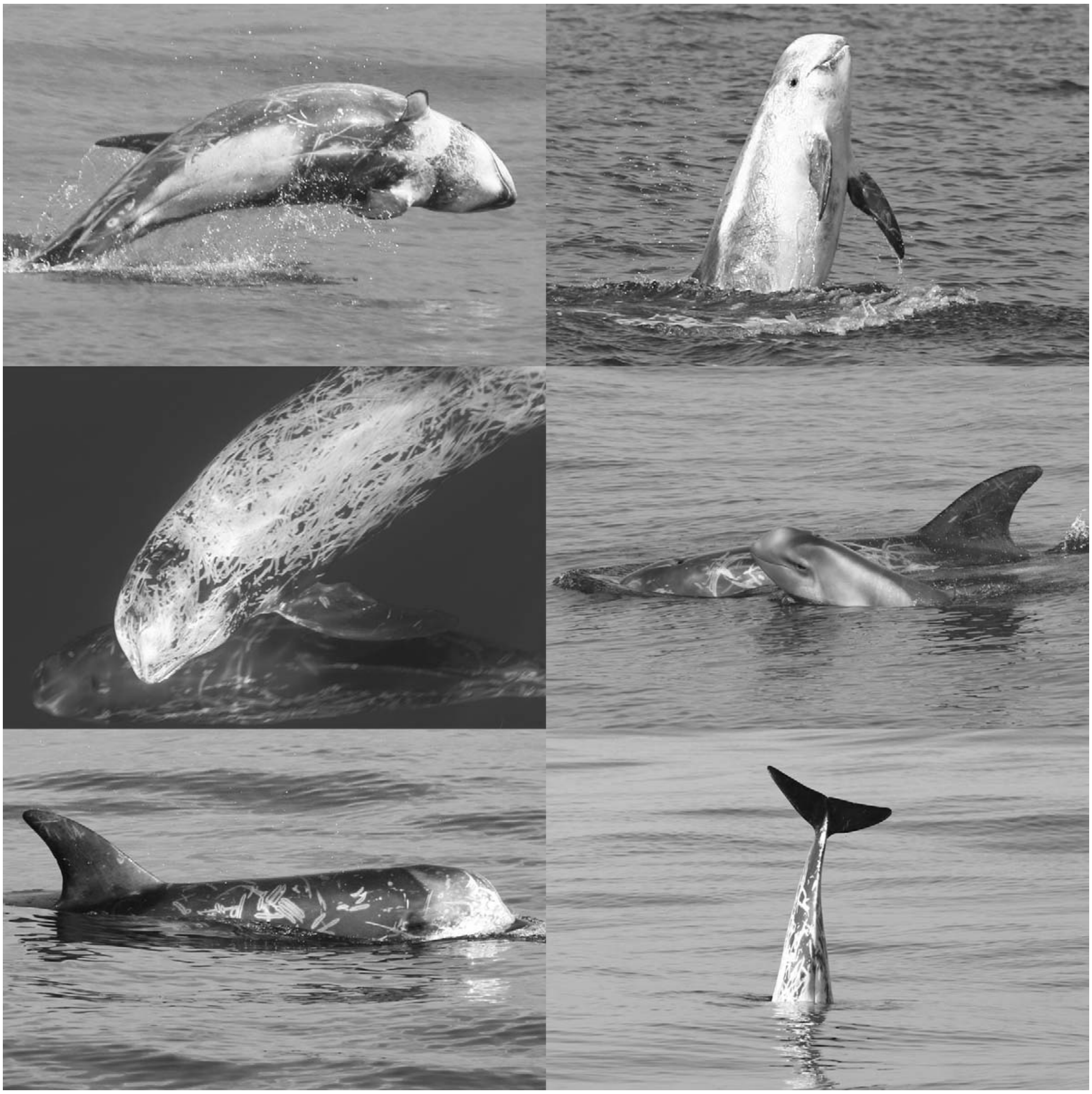

Fig. 1. These Risso's dolphins photographed in the Ligurian Sea show the characteristic morphology of the species: blunt head, robust foresection, long pectoral fins (flippers), tall falcate dorsal fin, anchor-shaped markings on the chest and dramatic scarring of adults, who turn almost white as they age. The right-bottom photo illustrates the characteristic 'head-standing' behaviour. Photos© Tethys Research Institute (clockwise: Caterina Lanfredi, Nino Pierantonio, Sabina Airoldi, Mauro Colla, Veronica Littardi, Federico Bendinoni).

was to identify knowledge gaps and areas where focussed studies should be conducted to inform conservation efforts in Mediterranean waters.

Natural history

Risso's dolphins have a distinctively shaped head, with no 'beak'. The melon is broad, squarish in profile and creased in front by a characteristic longitudinal furrow, thought to enable the animal to produce a uniquely angled sonar beam (Philips et al., 2003). The upper jaw projects slightly beyond the lower. The front half of the body is more robust than the back half. The dorsal fin is tall, erect and moderately falcate. The flippers are long and sickle-shaped.

Adult Risso's dolphins are heavily scarred, mostly from superficial wounds caused by the teeth of conspecifics. Depigmentation can persist for a long time, and this facilitates species identification at sea and also allows individuals to be photo-identified. The colour pattern changes remarkably with age (Fig. 1). Calves are grey to brown at birth, darken as they grow and become lead grey, typically accumulating the whitish tooth rakes over much of the body as they mature. Adults tend to lighten as they age and old animals can appear almost completely white (Fig. 1). Risso's dolphins have reduced dentition that is specialised to capture cephalopods, their main prey (Clarke, 1986). Functional teeth are absent in the upper jaw but there are 2–7 pairs of relatively large, conical teeth in the lower jaw. Exceptionally, small teeth are present in the upper jaw (Cagnolaro et al., 1983; Kruse et al., 1999).

Risso's dolphins are usually about 3 m long but can reach 4 m, with no significant sexual size dimorphism (Kruse et al., 1999). Body size of animals in the Mediterranean does not seem to differ from that reported for other regions, although comparisons are confounded to some extent by different measurement methods. In a sample of 126 individuals stranded in Italy between 1990 and 2009 and included in the Italian stranding database (http://mammiferimarini.unipv.it/), adults (i.e. those exceeding the mean length of the sample minus 1 SD, i.e. 207 cm) averaged 300 cm (95% C.I. = 292–309, median 300.0, SD = 41.1, N = 101). The largest individuals were between 325 and 354 cm long ($N = 12$), with only one reaching 400 cm. The smallest individuals were 115–125 cm long ($N = 3$). In a study of 18 animals (9 males and 9 females) from the western Mediterranean Sea, the oldest individual was a male of 308 cm that had 29+ dentinal growth layer groups (Raduán et al., 2007), each likely representing approximately 1 year (IWC, 1980, p. 30). The age of a 310-cm female stranded in Corsica was estimated as 2.5 years based on dentine layers (Frodello et al., 2000).

A demographic model, using information from around the world summarised by Kruse et al. (1999) and Perrin and Reilly (1984), yielded estimates of age at first reproduction of 11 years, inter-birth interval of 2.4 years and oldest age of reproducing females of 38 years (Taylor et al., 2007). The survival rate of calves was estimated as 0.87, adults 0.95 (Taylor et al., 2007). There is too little information on reproduction in Mediterranean Risso's dolphins to allow generalisations or comparisons. One study based on 18 animals from the western Mediterranean estimated average length at birth as 135 cm, with a gestation period of approximately 14 months (Raduán et al., 2007). Seasonality of births varies according to geographic area (Jefferson et al., 1993; Kruse et al., 1999). In the Mediterranean Sea most calves are probably born in the summer (Gaspari, 2004, Notarbartolo di Sciara and Demma, 2004). The oldest Risso's dolphin on record was estimated to be 34.5 years old (Baird, 2009). Hybrids between Risso's dolphins and common bottlenose dolphins have been recorded both in captivity and in the wild (Fraser, 1940; Shimura et al., 1986; Miyazaki et al., 1992; Jefferson et al., 1993).

Risso's dolphins observed in the Ligurian Sea during daytime were mostly moving at about 6–7 km h^{-1}, with surfacings of about 7–15 s followed by dives lasting 5–7 min, and occasionally longer (Tethys Research Institute, unpublished data). A male that stranded in Florida was satellite-tagged and followed for 23 days, during which time 95% of its dives were to depths of less than 50 m and only 1% were to depths greater than 200 m, with only a single dive to 400–500 m (Wells et al., 2009). The animal spent more than 99% of its time within 50 m of the surface and 99% of its dives lasted less than 6 min (55% were between 2 and 4 min). The longest dives lasted up to 9–10 min (Wells et al., 2009). Based on this recent information, the maximal dive time of 30 min reported by Mörzer-Bruyns (1971) and Clarke (1986, p. 304), and also cited in Kruse et al. (1999, p. 200), should probably be regarded as questionable.

Risso's dolphins can be energetic and active at the sea surface, breaching (leaping clear of the water), porpoising (arching well above the surface while swimming) and occasionally riding the bow of a vessel (Jefferson et al., 1993). Spy-hopping to look at boats and observers may occur. In the Mediterranean Sea they are often seen 'head-standing', i.e. staying almost motionless in a vertical position with the tail stock out of the water, sometimes for 10–20 s (Tethys Research Institute, unpublished data; Fig. 1). The reason behind this behaviour is unknown.

The sound repertory of Risso's dolphins includes a variety of pulsed and whistle-like sounds used for both echolocation and communication (Caldwell et al., 1969; Au, 1993; Corkeron and Van Parijs, 2001). Echolocation clicks in free-ranging animals average 40 μs with peak frequencies around 50 kHz and source levels of 202–222 dB re 1 μPa (peak to peak; Madsen et al., 2004). Risso's dolphins may be capable of hearing frequencies above 100 kHz (Nachtigall et al., 2005).

Distribution

Risso's dolphins can be found from the tropics through the temperate regions in both hemispheres (Leatherwood et al., 1980; Jefferson et al., 1993; Kruse et al., 1999; Taylor et al., 2008). They are rarely found in waters cooler than 10 °C (Kruse et al., 1999; Baird, 2009). Seasonal patterns of distribution and numbers appear to be associated with changes in prey availability and sea surface temperature (Kruse et al., 1999).

In the Mediterranean Sea (Fig. 2) the Risso's dolphin is one of eight cetacean species considered to be regular inhabitants (Notarbartolo di Sciara and Demma, 2004; Reeves and Notarbartolo di Sciara, 2006). Sightings have been reliably and consistently reported from the waters of Spain (Cañadas et al., 2002, 2005; Gannier, 2005), France (Di Méglio et al., 1999; Gannier, 2005), Monaco (Azzellino et al., 2008), Italy (Notarbartolo di Sciara et al., 1993) and Greece (Frantzis et al., 2003). Risso's dolphins seem to be rare in the Strait of Gibraltar and adjacent waters (Beaubrun and Roussel, 2000; Villalba et al., 2000; De Stephanis et al., 2008). There are a few sighting or stranding records from Morocco (Gannier, 2005), Algeria (Duguy et al., 1983; Boutiba, 1994), Malta (Vella, 1999a,b), Slovenia (Mazzatenta et al., 2005), Croatia (Bearzi et al., 2004; Holcer et al., 2008), Turkey (Dede and Öztürk, 2007; Tonay et al., 2009) and Israel (Goffman et al., 2000; Hadar et al., 2008). Stranding records from some of these areas are included in the MEDACES database (http://medaces.uv.es/). The species is rarely sighted off Tunisia (Ktari-Chakroun, 1980; Chakroun, 1994). Risso's dolphins may be present off Libya, Egypt, Lebanon and Syria where research effort has been low or nil. There is a single published record of a stranded animal in Libya (Bearzi, 2006), another in Lebanon (Gonzalvo, 2009) and none in Syria (Gonzalvo and Bearzi, 2008) or Egypt. Risso's dolphins do not occur in the Turkish Straits system (Öztürk et al., 2009) or in the Black Sea (Reeves and Notarbartolo di Sciara, 2006).

Risso's dolphins occur mainly in continental slope waters throughout the Mediterranean basin as well as around many of the region's offshore islands and archipelagos. Most observations have been in the northwestern part of the basin. In the Ligurian-Corso-Provençal basin, during the summer, Risso's dolphins are found regularly in continental slope waters that in this part of the Mediterranean occur mostly within 10 km, and in some areas only a few km, from the coast (Di Méglio et al., 1999; Azzellino et al., 2008). They are also observed regularly in the Alborán Sea and in the Gulf of Vera, where their range includes deep offshore waters (Cañadas et al., 2002, 2005). In the eastern Mediterranean, most information comes from the Greek seas, where Frantzis et al. (2003) reported a relatively homogeneous distribution of sightings and suggested that Risso's dolphins occur regularly in deep waters with steep bottom relief. Sighting frequencies, however, were low and the animals did not appear to be consistently present in any of the areas surveyed (Frantzis et al., 2003). A few Risso's dolphins have been observed in mixed-species groups with striped dolphins and short-beaked common dolphins in the deep waters of the semi-closed Gulf of Corinth (Frantzis and Herzing, 2002; Azzolin et al., 2010).

Population structure, numbers and trends

Based on mitochondrial DNA analyses, Risso's dolphins in the Mediterranean Sea are genetically differentiated from those in U.K. waters, with limited gene flow between the two areas (Gaspari et al., 2007). Genetic analyses of 33 samples from the Mediterranean region (27 from the Ligurian Sea) suggested relatively high diversity (Gaspari et al., 2007). The study by Gaspari et al. (2007) was not designed to reveal within-region population structure, but other studies have found evidence of such structure in common bottlenose dolphins (Natoli et al., 2005), short-beaked common dolphins (Natoli et al., 2008) and striped dolphins (Fossi et al., 2004; Gaspari et al., 2007). Taken together, those findings suggest that physical boundaries such as the Strait of Gibraltar (minimum width about 45 km and sill depths less than 145 m) and the much wider Sicily Channel (143 km and sill depths less than 200 m) as well as differences in habitat characteristics tend to restrict the

Fig. 2. Map of the Mediterranean Sea showing some of the locations cited in the text.

movements of some delphinids, leading to population structure. Further research is needed to characterise population structure of Risso's dolphins within the Mediterranean as well as the degree of genetic exchange with animals in the Atlantic. The species' failure to colonise the Black Sea could be explained by the lack of suitable habitat in the Turkish Straits system (Dardanelles minimum width about 450 m, sill depths less than 55 m) or, perhaps more importantly, by the remarkable absence of cephalopods (Nixon and Young, 2003; Jereb and Roper, 2005).

The Risso's dolphin has been assessed by IUCN as a species of Least Concern (Taylor et al., 2008). While there is not even a reasonable guess at the total numbers of Risso's dolphins worldwide, a few estimates exist for specific areas. Risso's dolphin numbers off California were reported to be almost an order of magnitude higher in winter (32,376, CV = 0.46) than in summer (3980, CV = 0.57; Forney and Barlow, 1998). Recently, numbers off California, Oregon and Washington were estimated at 11,621 (CV = 0.17; Carretta et al., 2008). Estimates also exist for the eastern tropical Pacific (175,800, CV = 0.38; Wade and Gerrodette, 1993), northern Gulf of Mexico (1589, CV = 0.27; Waring et al., 2009), western North Atlantic (20,479, CV = 0.59; Waring et al., 2009), waters around the Hawaiian islands (2372 animals, CV = 0.65; Barlow, 2006), Sri Lanka (alternative 'minimum' point estimates of 5500, assuming 3.1 dolphins/100 nm surveyed, or 13,000, assuming 7.2/100 nm; Kruse et al., 1991), the eastern Sulu Sea (1514, CV = 0.55; Dolar et al., 2006) and three areas of concentrated occurrence off Japan (83,300, CV = 0.17; Miyashita, 1993). More recently, Minamikawa et al. (2007) estimated 32,864 animals (CV = 0.45) north of 30°N latitude and west of 180° longitude off Japan. Those authors reported that although Risso's dolphins were observed south of 30°N, such animals were not included in the abundance estimation because they could belong to a stock not affected by the Japanese dolphin fishery.

There are several examples of long-term changes in abundance and distribution. For instance, Risso's dolphins were virtually absent in the Southern California Bight in the late 1950s (Norris and Prescott, 1961, did not even mention seeing them in 5 years during which time they 'systematically gathered information of every available kind' on cetaceans there, while collecting dolphins and pilot whales for Marineland of the Pacific; they observed 15 other cetacean species 'in sufficient detail' to provide individual accounts) and between 1975 and 1978 they constituted only 3% of the cetaceans observed in an extensive survey programme there (Dohl et al., 1980; as cited by Kruse et al., 1999). After an El Niño event in 1982–1983, however, daily counts of Risso's dolphins increased greatly, especially around Santa Catalina Island where they came to be considered common (Shane, 1994, 1995b) and apparently remained so through the 1990s (Kruse et al., 1999).

Little is known about numbers of Risso's dolphins in the Mediterranean Sea. The only abundance estimate based on line-transect methods refers to a 32,270 km^2 area east of Spain, where aerial surveys in 2001–2003 yielded an estimate of 493 (CV = 60.6%; Gómez de Segura et al., 2006). That estimate was not corrected for visibility bias and therefore likely underestimates the true abundance in the sampled area (Gómez de Segura et al., 2006). Ship surveys in the western Mediterranean (Forcada, 1998) as well as aerial and ship surveys in the Pelagos Sanctuary (Panigada et al., 2009, 2010) did not result in sufficient numbers of sightings to make meaningful estimates of abundance for Risso's dolphins. No sightings of Risso's dolphins were made during three ship-based line-transect surveys in 2002–2003 within an area of 13,200 km^2 off northern Sicily (Fortuna et al., 2007). In all Mediterranean areas with suitable habitat that have been surveyed, encounter rates for Risso's dolphins have been low compared with rates for other more common delphinids; rates have often been an order of magnitude lower than for striped dolphins, the most abundant species. In the MEDACES and Italian stranding databases, only a small proportion of total strandings have been of Risso's dolphins: 2.5% of all records in the MEDACES database (N = 7796; Universitat de Valencia, 2009) and 3.6% of all records or 3.7% of all animals in the Italian database (N = 3695 records, 3805 animals; http://mammiferimarini.unipv.it/as of 4 January 2010).

Ecology

Diet

Risso's dolphins seem to feed predominantly during the night (Shane, 1995a,b; Praca and Gannier, 2007; Soldevilla et al., 2010), probably to take advantage of the circadian vertical movements of their prey (Roper and Young, 1975; Hanlon and Messinger, 1996; Soldevilla et al., 2010). Diet consists primarily of cephalopods, with a clear preference for mesopelagic squids (Clarke, 1996; Kruse et al., 1999). The stomach contents of stranded animals in southeastern Africa were exclusively cephalopods, *Loligo vulgaris reynaudu* being the most important single prey item. Other significant contributors to the diet were *Lycoteuthis diadema*, *Argonauta nodosa*, *Octopus magnificus* and *Ancistrocherius lesueur* (Cockcroft et al., 1993). The lesser octopus *Eledone cirrhosa* was one of the main prey types found in Risso's dolphins stranded in Scotland, Wales and southern England (Clarke and Pascoe, 1985).

The stomach contents of 13 Risso's dolphins stranded and one animal by-caught in eastern Spain between 1987 and 2003 showed a strong preponderance of cephalopods. A total of 25 species belonging to 13 families were found, mostly Argonautidae, Ommastrephidae, Histioteuthidae and Onychoteuthidae (Blanco et al., 2006). Despite the numerical importance and high frequency of the small pelagic octopod *Argonauta argo*, the greatest nutritional value would have come from *Todarodes sagittatus*, *Histioteuthis bonnelli*, *Histioteuthis reversa*, *Ancistroteuthis lichtensteini* and *Illex coindetii*, due to their large size (Blanco et al., 2006). Cephalopod remains from the stomachs of Risso's dolphins by-caught or stranded in the central Mediterranean Sea included primarily the mesopelagic squids *Todarodes sagittatus*, *Ancistroteuthis lichtensteini*, *Histioteuthis bonnelli*, *Histioteuthis reversa* and in lesser frequency and quantity the argonautid *Argonauta argo* and the sepiolid *Heteroteuthis dispar* as well as a number of other cephalopod species belonging to various families (Table 1). The stomachs of two Risso's dolphins taken as bycatch off the Turkish coast contained exclusively cephalopod remains, predominantly *Histioteuthis reversa* (61%). All other species accounted for less than 10% of all beaks. Most prey were oceanic cephalopods with wide vertical distribution and circadian movements (Öztürk et al., 2007). Many species recorded from the stomach contents are bioluminescent, and it has been suggested that this may facilitate their detection by Risso's dolphins (Bello, 1992; Öztürk et al., 2007). Cycloid fish scales as well as bryozoans were found in the stomach of a juvenile stranded in eastern Spain, while pelagic tunicate species had been eaten by two adults (Blanco et al., 2006). Blanco et al. (2006) suggested that occurrence of tunicates in the diet of Risso's dolphins may be underestimated due to rapid digestion of these watery animals.

Risso's dolphins have been observed to forage at night around fishing boats using illuminated handlines for squid in the archipelago Pontino Campano. These interactions involved feeding by groups of 2–5 animals, waiting near fishing boats until the light had attracted squid (Mussi et al., 1999).

Shane (1995b) hypothesised that the replacement of short-finned pilot whales *Globicephala macrorhynchus* by Risso's dolphins around Santa Catalina Island following an El Niño event represented competitive displacement related to limited food resources (see above). A curious feature of Risso's dolphin distribution in the Mediterranean region is that these dolphins are rare in the Gibraltar Strait and adjacent areas, where long-finned pilot whales *Globicephala melas* are relatively abundant (De Stephanis et al., 2008). This might be interpreted as indicative of competitive exclusion. Niche overlap and competition for prey with Mediterranean odontocetes other than long-finned pilot whales is considered unlikely (Blanco et al., 2005).

Habitat and movements

Risso's dolphins inhabit continental slope and deep oceanic waters, being most common in steep upper sections of the continental slope as well as around subsurface seamounts, escarpments and areas with steep bottom topography at any distance from the coast. Upwelling phenomena and mixing of shelf and oceanic waters in the upper continental slope aggregate zooplankton and micronekton and create conditions that attract a considerable variety of the Risso's dolphin's cephalopod prey, including squids that usually inhabit deep oceanic waters (Baumgartner, 1997; Davis et al., 1998, 2002; Kruse et al., 1999; Yen et al., 2004). Risso's dolphins may 'follow' oceanic fronts as they move onto or off the shelf and upper continental slope in order to continue taking advantage of prey aggregations (Baumgartner, 1997).

In the Mediterranean Sea, similarly to other areas around the world, Risso's dolphins prefer steep slopes and submarine canyons (Cañadas et al., 2002; Gannier, 2005; Azzellino et al., 2008; Moulins et al., 2008). Risso's dolphins across the Mediterranean Sea ($N = 60$ sightings) were sighted over mean bottom depths of 1280 m, at a mean distance of 20.4 km (SE = 30.4 km) from the 200-m isobath. About 32% of sightings occurred within 5 km and over 82% within 30 km of the 200-m isobath (Mangion and Gannier, 2002). Risso's dolphins sighted off southern Spain ($N = 31$) preferred steep areas with depths greater than 600 m (no sightings in waters shallower than 400 m), thought to match the habitat of their prey (Cañadas et al., 2002). In a study off eastern Spain, distribution was significantly related to depth (only), but Risso's dolphins, which were observed in waters between 500 and 2600 m deep, seemed to prefer waters deeper than 1500 m (Gómez de Segura et al., 2008). Off Italy, encounter rates were highest in areas 1000 m deep and 14 km from the coast (Notarbartolo di Sciara et al., 1993). The frequency of occurrence of Risso's dolphins in and near the Pelagos Sanctuary was similarly higher near the 1000-m isobath (e.g. Moulins et al., 2008), but sightings were also made far offshore and in deeper pelagic waters (Beaubrun et al., 1997; Airoldi et al., 2000; Laran et al., 2002), suggesting that distribution is not limited to the continental slope. Praca and Gannier (2007) modelled the distribution of Risso's dolphins in the northwestern Mediterranean and found a strong relationship with steep slope and proximity to the 200 m contour as well as a certain preference for shallow areas. According to that study, the main habitat of Risso's dolphins was restricted and located on the upper part of the continental slope at a mean depth of 638 m. Habitats of Risso's dolphins and long-finned pilot whales were well separated (Praca and Gannier, 2007).

In the western Ligurian Sea where the continental shelf is particularly narrow, Risso's dolphins were distributed along steep sections of the upper continental slope, a few km from the coast, at depths ranging between 374 and 1100 m (mean 822 m; Azzellino et al., 2008). Their occurrence in this area during the summer months did not change across years or months but encounter rates were higher during certain shorter intervals, suggesting some sort of 'transient' use of the study area. This may indicate a strategy to exploit the temporary availability of food resources induced by zooplankton accumulation (Azzellino et al., 2008). A correlation was also found between Risso's dolphin presence and stormy sea conditions in the preceding days (Azzellino et al., 2008). Those authors speculated that moving along the slope area would be an efficient strategy to exploit prey attracted by the wind-driven accumulation of zooplankton (Azzellino et al., 2008).

Preliminary photo-identification data suggest relatively wide movements but do not preclude some degree of fidelity or regular use of specific areas (Cañadas and Sagarminaga, 1997; David and Di Méglio, 1999; Casacci and Gannier, 2000; Mussi and Miragliuolo, 2003; Airoldi et al., 2005; Mariani et al., 2010).

Group size and social structure

Risso's dolphin groups tend to be small to moderate in size (up to around 100 individuals), averaging perhaps 30 animals (Kruse et al., 1999). Groups of up to 4000 have been reported off California

Table 1
Main prey items found in the stomachs of Risso's dolphins in the Mediterranean Sea. All habitats and depth ranges based on www.sealifebase.org (consulted in January 2010).

Family	Species	Habitat	Depth range (m)	References
Argonautidae	*Argonauta argo*	Demersal Epipelagic	0–200	Bello (1992); Carlini et al. (1992); Blanco et al. (2006); Öztürk et al. (2007)
Brachioteuthidae	*Brachioteuthis riisei*	Demersal Epipelagic Mesopelagic	0–3000	Blanco et al. (2006); Öztürk et al. (2007)
Chiroteuthidae	*Chiroteuthis veranyi*	Demersal		Bello (1992); Blanco et al. (2006); Öztürk et al. (2007)
Chtenopterygidae	*Chtenopteryx sicula*	Mesopelagic	500–1000	Öztürk et al. (2007)
Cranchiidae	*Galiteuthis armata*	Mesopelagic	740–760	Podestà and Meotti (1991); Blanco et al. (2006)
Cranchiidae	(Including *Megalocranchia* sp.)	Demersal		Podestà and Meotti (1991); Blanco et al. (2006)
Enoploteuthidae	*Abraliopsis pfefferi*	Mesopelagic	~750	Blanco et al. (2006)
Enoploteuthidae	*Abralia veranyi*	Mesopelagic	~750	Öztürk et al. (2007)
Enoploteuthidae	*Ancistrocheirus lesueurii*	Demersal		Blanco et al. (2006); Öztürk et al. (2007)
Enoploteuthidae	*Ancistroteuthis lichtensteini*	Demersal Pelagic	0–250	Podestà and Meotti (1991); Bello (1992); Carlini et al. (1992); Würtz et al. (1992); Blanco et al. (2006)
Histioteuthidae	*Histiotetuthis bonellii*	Demersal	500–2000	Podestà and Meotti (1991); Bello (1992); Carlini et al. (1992); Würtz et al. (1992); Orsi Relini et al. (1997); Blanco et al. (2006); Öztürk et al. (2007)
Histioteuthidae	*Histioteuthis reversa*	Epipelagic Bathipelagic	0–200 1300–1800	Bello (1992); Carlini et al. (1992); Würtz et al. (1992); Orsi Relini et al. (1997); Blanco et al. (2006); Öztürk et al. (2007)
Loliginidae	*Loligo forbesii*	Demersal	100–400	Bello and Bentivegna (1994); Maio (1998)
Loliginidae	*Loligo vulgaris*	Demersal Epipelagic Mesopelagic	0–500	Carlini et al. (1992); Blanco et al. (2006)
Mastigoteuthidae	*Mastigoteuthis* sp.	Demersal		Blanco et al., 2006
Ommastrephidae	*Illex coindetii*	Demersal Epipelagic Mesopelagic	0–1000	Carlini et al. (1992); Blanco et al. (2006)
Ommastrephidae	*Ommastrephes bartramii*	Demersal Epipelagic Mesopelagic	0–1500	Blanco et al. (2006); Öztürk et al. (2007)
Onychoteuthidae	*Onychoteuthis banksii*	Demersal Epipelagic Mesopelagic	0–800	Bello (1992); Blanco et al. (2006); Öztürk et al. (2007)
Ommastrephidae	*Todaropsis eblanae*	Epipelagic Mesopelagic	20–700	Blanco et al. (2006)
Ommastrephidae	*Todarodes sagittatus*	Pelagic	20–2000	Bello (1992); Carlini et al. (1992); Würtz et al. (1992); Bello and Bentivegna (1994); Orsi Relini et al. (1997); Maio (1998); Blanco et al. (2006); Öztürk et al. (2007)
Sepiidae	*Sepia officinalis*	Demersal	0–200	Carlini et al. (1992); Blanco et al. (2006)
Sepiolidae	*Sepiola* sp.	Demersal	0–200	Blanco et al. (2006)
Sepiolidae	*Heteroteuthis dispar*	Demersal	200–3000	Carlini et al. (1992); Würtz et al. (1992); Blanco et al. (2006); Öztürk et al. (2007)
Ocythoidae	*Ocythoe tuberculata*	Epipelagic	0–200	Bello (1992); Carlini et al. (1992); Blanco et al. (2006)
Octopodidae	*Eledone cirrhosa*	Demersal	0–770	Podestà and Meotti (1991); Carlini et al. (1992); Blanco et al. (2006)
Octopodidae	*Octopus macropus*	Demersal	0–20	Blanco et al. (2006)
Octopodidae	*Octopus salutii*	Demersal		Blanco et al. (2006)
Octopodidae	*Octopus vulgaris*	Demersal	0–200	Blanco et al. (2006)
Octopoteuthidae	*Octopoteuthis sicula*	Demersal		Öztürk et al. (2007)
Pyroteuthidae	*Pyroteuthis margaritifera*	Demersal		Öztürk et al. (2007)
Pyrosomidae	*Pyrosoma atlanticum*	Pelagic	~250	Blanco et al. (2006)
Salpidae	*Iasis zonaria*	Pelagic	0–200	Blanco et al. (2006)
Salpidae	*Salpa fusiformis*	Pelagic	0–200	Blanco et al. (2006)

(Dohl et al., 1983 as cited by Kruse et al., 1999). Large aggregations are thought to form in response to abundant and concentrated food resources. Groups (N = 595) off Pico Island in the Azores included between 1 and 61 individuals, with a median of 13 (Hartman et al., 2009). Group fluidity is high, with small subgroups displaying the highest degree of group fidelity (Kruse et al., 1999). Few studies have focussed on the social structure of Risso's dolphins. Off Pico island, Azores, individuals were found to have long-term bonds and they occurred in pairs or stable clusters of 3–12 individuals, with strong associations between adult males and between adult

Table 2
Group sizes of Risso's dolphins observed in the Mediterranean Sea.

Geographic area	Years	*N*	Mean	Error	Range	Platform	Reference
Mediterranean Sea	1997–2001	19	12.5	–	2–35	Motorsailer	Gannier (2005)
Alborán Sea	1992–2002	62	12.5	SE = 1.41	–	Motorsailer	Cañadas et al. (2005)
Off southeastern Spain	1992–1995	28	17.2	SD = 13.88	2–55	Motorsailer	Cañadas and Sagarminaga (1997)
Off southeastern Spain	2000–2003	17	21.7	–	1–80	Airplane	Gómez de Segura et al. (2008)
Pelagos Sanctuary	1990–1998	70	12	SD = 12.2	1–70	Motorsailer	Airoldi et al. (2000)
Pelagos Sanctuary	1990–2006	151	15	–	–	Motorsailer	Gaspari et al. (2008)
Pelagos Sanctuary	1996–2000	43	37	SD = 31 IQR 15–53	1–130	Motorsailer	Azzellino et al. (2008)
Central Mediterranean waters off Italy	1986–1989	12	16.67	SD = 16.43 SE = 4.74	3–55	Motorsailer	Notarbartolo di Sciara et al. (1993)

females (Hartman et al., 2008). Risso's dolphins in the Ligurian Sea were characterised by low levels of relatedness based on genetic analyses performed on samples of skin tissue, and kin-based affiliations were found only within groups of females. While females within groups tended to associate with related females, and females outside the groups were not related to each other, males within groups were less related than expected by chance (Gaspari, 2004). Group sizes of Risso's dolphins observed in parts of the Mediterranean Sea are summarised in Table 2. As the definition of 'group' can vary among studies and sampling methods are often undefined, the reported group sizes (and those reported in a number of other unpublished contributions) represent relative values that cannot be directly compared.

Globally Risso's dolphins have been observed in mixed groups with a number of species, including the Dall's porpoise *Phocoenoides dalli*, Pacific white-sided dolphin *Lagenorhynchus obliquidens*, dusky dolphin *Lagenorhynchus obscurus*, northern right whale dolphin *Lissodelphis borealis*, bottlenose dolphin *Tursiops* sp., common dolphins *Delphinus* sp., dolphins in the genus *Stenella*, pilot whales *Globicephala* sp., pygmy killer whale *Feresa attenuata* and false killer whale *Pseudorca crassidens* (Würsig and Würsig, 1980; Baird and Stacey, 1991; Kruse et al., 1999; Hartman et al., 2008; Pereira, 2008). Interactions also have been observed with gray whales *Eschrichtius robustus* (Shelden et al., 1995), fin whales *Balaenoptera physalus* and sperm whales *Physeter macrocephalus* (Kruse et al., 1999; Hartman et al., 2008; Pereira, 2008). Associations with other cetacean species are uncommon in the Mediterranean Sea. In the Gulf of Corinth, Risso's dolphins (2 individuals separately) were observed in mixed groups with striped dolphins and short-beaked common dolphins (Frantzis and Herzing, 2002). In the waters off the island of Ischia, Italy, Risso's dolphins were occasionally seen in association with striped dolphins and sperm whales (Mariani et al., 2010). In Turkish waters 2 individuals were observed in a group of striped dolphins (Dede et al., 2009).

Predation

There is little information on the predation risks faced by Risso's dolphins around the world. Large sharks (e.g. the white shark *Carcharodon carcharias*; Heithaus, 2001) and killer whales are both likely predators based, for example, on observations of wounded animals (especially calves; Hartman et al., 2008). In the Mediterranean Sea predation is considered a minor cause of mortality for small cetaceans generally (Aguilar, 2000; Bearzi et al., 2003, 2008) and it is unlikely to be significant for Risso's dolphins. Numbers of large sharks have declined drastically in Mediterranean waters over the past century (Ferretti et al., 2008) and this must have considerably reduced predation pressure. Other potential dolphin predators, such as killer whales and false killer whales, are rare in the region (Notarbartolo di Sciara, 1987; Reeves and Notarbartolo di Sciara, 2006) and therefore unlikely to cause significant mortality. An attack by common bottlenose dolphins resulted in the death of a juvenile Risso's dolphin in U.K. coastal waters (Barnett et al., 2009), but similar cases have not been reported in the Mediterranean.

Parasites and epizootics

At least a few of the many parasites known to infect Risso's dolphins and other Mediterranean cetaceans (Dhermain et al., 2002) can have serious health effects. For example, a Risso's dolphin and its fetus stranded alive on the Spanish Mediterranean coast with what was diagnosed as a fatal toxoplasmosis infection (Resendes et al., 2002). Infections with the protozoan agent *Toxoplasma gondii* are common in the western Mediterranean and especially prevalent in coastal areas, but only animals with compromised immune systems are at risk of becoming seriously ill (Domingo et al., 2000; Resendes et al., 2002; Cabezon et al., 2004). Among the other parasites documented in Mediterranean Risso's dolphins are *Crassicauda grampicola* and *Pennella* sp. (found in or on a few animals dead- and live-stranded in Spain and Italy; Cornaglia et al., 2000; Domingo et al., 2000; Resendes et al., 2002; Zucca et al., 2004, 2005; Marcer et al., 2008). Also, Fernández et al. (2003) reported 5 species of gastrointestinal helminths found in 17 Risso's dolphins stranded in the western Mediterranean.

Recent viral epizootics in the Mediterranean Sea have affected populations of several dolphin species, particularly striped dolphins (Van Bressem et al., 1991; Aguilar and Raga, 1993; Raga et al., 2008) but also common bottlenose dolphins (Tsur et al., 1997; Van de Bildt et al., 2001) and long-finned pilot whales *Globicephala melas* (Fernández et al., 2008). While morbillivirus infections were confirmed in Risso's dolphins from the western Atlantic (Duignan et al., 1995), there is no evidence that viral outbreaks have affected these dolphins in the Mediterranean.

Stranding

Mass strandings of Risso's dolphins are rare (Baird, 2009). Of the many strandings in the Mediterranean Sea, we found only one report of a live-stranding involving more than 2 animals. There was a stranding of 5 animals in eastern Spain in 1994 (Alegre et al., 1996). The dolphins were immediately returned to the open sea, but 24 h later 4 of them stranded again in the same area (1 adult, 2 subadults and 1 juvenile, all females). The adult was treated for large wounds on both sides of the body and an acute respiratory problem but died within 4 h. The other 3, reportedly also in poor condition, were returned to sea and disappeared.

Threats

A variety of human activities threaten cetaceans and many of those activities are expected to increase in the foreseeable future (Reynolds et al., 2009). Below, we identify and describe the threats likely to affect Risso's dolphins, particularly in the Mediterranean Sea, with the aim of informing management and guiding research effort.

Incidental mortality

Incidental mortality (or bycatch) of Risso's dolphins in fishing gear has been reported in many areas. For example, in US waters including the Pacific, Atlantic and Gulf of Mexico EEZs, relatively small numbers get entangled in pelagic drift gillnets, pelagic longlines, purse seines and pelagic pair trawls (Carretta et al., 2008; Waring et al., 2009). Nearly all of the animals taken in gillnets die, but frequently the longline-caught animals are released alive with wounds ranging from minor to severe. The Risso's dolphin is one of the primary cetacean species (along with pilot whales Globicephala spp.) that interact with the U.S. East Coast pelagic longline fishery (Garrison, 2007). Of 64 Risso's dolphins reported as captured (either mouth-hooked or entangled in line) between 1992 and 2004, 30 were seriously injured and 4 were observed dead. Risso's dolphin interactions were correlated with geographic location, proximity to the shelf break, the length of the main line and the bait type. Risso's dolphins were attracted to squid bait as a ready food source but they could also depredate the catch. The use of fish bait significantly decreased the frequency of Risso's dolphin by-catch (Garrison, 2007). Off eastern Taiwan large numbers of dolphins, often including Risso's dolphins, are taken in large-mesh drift gillnets for large pelagic fish (Perrin et al., 2005). In Sri Lanka, the Philippines and Ghana, Risso's dolphins are often taken in drift gillnets and sold openly in fish markets (Leatherwood and Reeves, 1989; Kruse et al., 1991; Dolar, 1994; Van Waerebeek et al., 2009). In these and some other areas, the distinction between bycatch (accidental) and directed catch (intentional) is blurred because of the market value of cetacean products for human consumption and shark bait.

In the Mediterranean, most bycatch of Risso's dolphins is by pelagic gillnets (also called driftnets). These are large, floating nets that target primarily swordfish *Xiphias gladius* and tunas *Thunnus* spp. Driftnets can be up to 50 km long and hang vertically 20–30 m from the surface. Because these nets indiscriminately kill protected species such as whales, dolphins, sharks, turtles, rays and sea birds (Notarbartolo di Sciara, 1990; Di Natale and Notarbartolo di Sciara, 1994; IWC, 1994), they have been banned in the European Union (EU) since 2002. The ongoing illegal use of driftnets in several parts of the Mediterranean (Pace et al., 2008; Cornax and Pardo, 2009), including areas where Risso's dolphins occur, means that incidental mortality almost certainly continues at some scale. For instance, mortality of Risso's dolphins in driftnets was reported from the Turkish side of the Aegean Sea based on direct observations from boats (Öztürk et al., 2001). Risso's dolphin mortality in driftnets deployed by the Italian fleet was significant and probably unsustainable in the early 1990s (Di Natale, 1995) and it likely remains high although there have been no focussed investigations in recent years. Of 100 Risso's dolphins stranded or rescued along the coasts of Italy between 1986 and 2005, 14 were reported to have signs of bycatch. Of these, 4 bore hooks somewhere on the body or were entangled in longline, 2 were entangled in gillnetting, 1 was entangled in a set net of some kind (trammel or gillnet), 2 had unspecified 'fishing gear' on the body and 5 had fin amputations ($N = 4$) or knife cuts ($N = 1$) (Centro Studi Cetacei, 1987, 1988, 1990, 1991, 1992, 1994, 1995, 1996a,b, 1997a,b, 1998, 2000, 2001, 2002, 2003, 2004; Centro Studi Cetacei Onlus e Museo Civico di Storia Naturale di Milano, 2004, 2006a,b). One Risso's dolphin that stranded alive in Italy was released after a large fishing hook had been removed from its upper jaw (Zucca et al., 2005). Cataldini and Bello (1987) described an incident in which a Risso's dolphin became hooked on a drifting longline set for swordfish off southern Italy. Presumably, the animal had been attempting to remove bait, whole mackerel *Scomber scombrus*, from the line. The dolphin was taken on board and released alive 34 h later.

Mortality of cetaceans, including Risso's dolphins, also occurs in the Spanish surface longline fishery in the western Mediterranean, which targets swordfish, bluefin tuna *T. thynnus* and albacore *T. alalunga* (Camiñas and Valeiras, 2001). Hooks are baited with fish (e.g. mackerel, sardine, scabbard fish) and shortfin squid *Illex* spp. (Valeiras and Camiñas, 2003). A study conducted in 1999 and 2000, encompassing 798 fishing operations with onboard observers, reported bycatch of striped dolphins ($N = 7$) and Risso's dolphins ($N = 7$; 5 in swordfish and 2 in bluefin tuna gear) (Camiñas and Valeiras, 2001). Most animals reportedly were released alive (Valeiras and Camiñas, 2002).

Three of 8 animals stranded in Croatia between 2000 and 2002 reportedly had been by-caught in fishing nets (presumably gillnets; Gomerčić et al., 2006). There are a few reports of bycatch of Risso's dolphins in bottom-set gillnets and trammel nets deployed in France and Italy (e.g. Duguy et al., 1983; Di Natale and Notarbartolo di Sciara, 1994).

Stranding data under-represent the true scale of fishery-related mortality and serious injury because (i) not all animals that die or are seriously injured wash ashore, (ii) not all of those that do wash ashore show signs of entanglement or other fishery interaction and (iii) not all dolphins that wash ashore are detected, investigated and reported. Moreover, the level of experience and technical expertise of investigators involved in stranding networks varies widely and the ability to recognize and diagnose the signs of fishery interactions (e.g. scars, wounds, disfigurements) is an acquired skill (Read and Murray, 2000). Considering that methods to investigate and assess incidental mortality of small cetaceans—through either onboard observation or studies of strandings—are now fairly well developed (e.g. Lien et al., 1994; Northridge, 1996; NMFS, 2004; Northridge and Fortuna, 2008), specific protocols should be implemented within the Mediterranean to improve understanding and mitigate mortality of Risso's dolphins and other small cetaceans. One caveat is that assessment of bycatches of protected species by vessels operating illegally, as is the case with those that deploy pelagic drift gillnets across most of the basin, is a particular challenge.

Intentional takes

As mentioned earlier, much of the 'bycatch' of Risso's and other dolphins in fishing gear in places like Sri Lanka, the Philippines and Ghana is intentional: the animals are landed and used for human consumption or as shark bait in several areas around the world (Leatherwood and Reeves, 1989; Kruse et al., 1991; Dolar, 1994; Dizon et al., 2000; Baker et al., 2006; Van Waerebeek et al., 2009). Also, they are hunted in some of those countries with harpoons and other weapons. In US Pacific and Atlantic waters, there is evidence of occasional shooting of Risso's dolphins, apparently by fishermen who view them as harmful to fisheries (Carretta et al., 2008; Waring et al., 2009).

There is no evidence that intentional killing of Risso's dolphins has ever occurred on a major scale in Mediterranean waters, though some may have died during the extermination campaigns conducted until the first half of the 20th century and directed primarily at common bottlenose dolphins and short-beaked common dolphins (Bearzi et al., 2004). Of the 100 Risso's dolphins stranded or rescued along the coasts of Italy between 1986 and 2005, 2 were reported to have bullet wounds and had likely been shot (Centro Studi Cetacei, 1988, 1992).

Small numbers of Risso's dolphins taken in drive hunts in Japan have been brought into captivity and on a few occasions live-stranded individuals have been rehabilitated and kept in aquaria in the United States (Kruse et al., 1999). There have also been a few cases in the Mediterranean region of attempts to rehabilitate animals that had live-stranded or were otherwise in difficulty (Alegre et al., 1996; Alonso et al., 1999; Stanzani et al., 2006; Marcer et al., 2008).

Noise and direct disturbance

There is growing evidence that prolonged direct (or physical) disturbance and noise caused by boat traffic can affect the behaviour and habitat use of cetaceans (Nowacek et al., 2007). In the Mediterranean Sea there has been a great expansion of recreational boat traffic and shipping in recent decades (Dobler, 2002), but the possibility that this has led to disruption of behaviour or excluded Risso's dolphins from important habitat has not been investigated. Several studies elsewhere have shown that vessel traffic can affect dolphin behaviour, activity and energy budgets, habitat use and reproductive success (e.g. Lusseau, 2003, 2004; Bejder et al., 2006). This can include short-term displacement, long-term area avoidance and reduced female reproductive success. Risso's dolphins may be affected in these ways when they move into coastal waters or when their usual habitat occurs in or near areas of high vessel traffic. For instance, a preliminary study off Pico, Azores, suggested that the resting behaviour of Risso's dolphins was disrupted by whale watching boats (Visser et al., 2006; Oudejans et al., 2007).

An instance of severe harassment of a group of Risso's dolphins occurred off the island of Ischia in Italy in August 2000 when pleasure boats approached approximately 20 animals sighted 1–2 km from shore (Bearzi, 2003; Miragliuolo et al., 2004). As the number of boats increased, Harbour Master's officers and dolphin researchers intervened to protect the animals. By the time the authorities arrived, the dolphins had been surrounded by perhaps 100 speedboats and herded into a resort harbour where some 400 boats were anchored. The dolphins ended up in water less than 3 m deep. Dozens of boats headed towards them at high speed every time they surfaced. The dolphins changed course and speed abruptly as the boaters tried to photograph and 'play' with them. They showed clear signs of distress and swam erratically at high speed, sometimes colliding with one another. One of at least 3 calves in the group was seen spinning and swimming in circles apart from the others. Through a 2-h effort, the officers and researchers managed to clear the immediate area around the dolphins of pleasure boats and the animals moved offshore in a single, tight group (Bearzi, 2003; Miragliuolo et al., 2004). Such an event shows that boat disturbance and unregulated dolphin watching, in the absence of good public awareness and education, can be a significant threat.

Noise from human activities including seismic surveys, marine construction and the use of military or other sonars is a cause for concern for Risso's dolphins and other cetaceans (Richardson et al., 1995; Nowacek et al., 2007). However, so far no deaths of Risso's dolphins have been linked definitively to noise. Jepson et al. (2005) found evidence of *in vivo* gas bubble formation and gas embolism associated with acute and chronic tissue injury in several cetacean species, including Risso's dolphins, and suggested further investigation of its relationship with exposure to anthropogenic sound (also see Fernández et al., 2005). In this regard, Wang and Yang (2006) reported 2 live-strandings of single Risso's dolphins in Taiwan. Noting that such events are 'fairly common' there, those authors concluded that these 2 strandings probably were not related to noise but that other strandings during the same time period and involving other species probably were.

Prey depletion

In the Mediterranean Sea, prey depletion caused by overfishing is regarded as a threat to short-beaked common dolphins (Bearzi et al., 2003) and common bottlenose dolphins (Bearzi et al., 2008), whose diets include some species that are also targeted by fisheries. As a predominantly teuthophagous species that feeds in continental slope waters, the Risso's dolphin may be less vulnerable to this threat since most fishing occurs in continental shelf waters and targets bony fishes. Few of the main cephalopod prey species of Risso's dolphins are commercially important. Two factors, however, are of concern: (1) the possible expansion of Mediterranean deep-water fisheries (e.g. Politou et al., 2003), as observed elsewhere (Morato et al., 2006), and (2) the tendency of fisheries to target species lower and lower in the food web as populations of higher trophic level species are depleted (Pauly et al., 1998; Sala et al., 2004; Pauly and Palomares, 2005). These trends could lead to reductions in prey populations or otherwise disrupt food webs in continental slope waters where Risso's dolphins forage.

Xenobiotic contamination

Toxic contamination can affect reproduction and health at the individual and population level (O'Hara and O'Shea, 2001; Fossi and Marsili, 2003; Newman and Smith, 2006). There is evidence to suggest a causal link between organochlorine exposure and reproductive, endocrine and immunological disorders in cetaceans (Aguilar and Borrell, 1994; Lahvis et al., 1995; Jepson et al., 1999; Schwacke et al., 2002; Hall et al., 2006). Levels of organochlorine compounds in Risso's dolphins from the Mediterranean Sea have been described as 'high' (Corsolini et al., 1995; Marsili and Focardi, 1997; Storelli and Marcotrigiano, 2000), as have levels of trace metals (Storelli et al., 1999; Frodello et al., 2000; Frodello and Marchand, 2001; Shoham-Frider et al., 2002; Capelli et al., 2008). It is uncertain, however, whether recent and current levels of exposure to any of these contaminants are affecting Risso's dolphins in the region. Cephalophods in the stomach of one Risso's dolphin stranded in Corsica had mercury concentrations about 25 times higher than those of fish found in the stomachs of other delphinid species in the same sample, and 50 times higher than concentrations recommended for human consumption (Frodello et al., 2000).

Ingestion of debris

Plastic debris has become widespread in the marine environment (Wolfe, 1987; Laist et al., 1999; Derraik, 2002). The problem is particularly acute in the Mediterranean Sea, where much of the coastline is heavily developed and the human presence is nearly ubiquitous. Plastic accumulates in Risso's dolphin habitat in concentrations that vary depending on meteorological forcing, marine currents and debris input levels (Aliani et al., 2003). Obstruction of the digestive tract by ingested plastic is a known cause of cetacean mortality (Walker and Coe, 1990; Tarpley and Marwitz, 1993). The causes of plastic ingestion by cetaceans probably vary. In some instances it may be related to debilitation or starvation, in others simply a consequence of investigating inappropriate prey items (Kastelein and Lavaleije, 1992; Pribanic et al., 1999; Baird and Hooker, 2000; Poncelet et al., 2000). The chances of the latter may be higher for prematurely weaned calves (Baird and Hooker, 2000). Although it is not unusual to find plastic and other debris in the stomachs of Risso's dolphins (Laist, 1997; González et al., 2000; Shoham-Frider et al., 2002), it is unclear whether this constitutes a serious threat to populations. Of the 100 Risso's dolphins stranded or rescued along the coasts of Italy between 1986 and 2005, one reportedly had many plastic bags and a ping-pong ball in its stomach, and the stomach and esophagus of another were occluded by plastic bags (Centro Studi Cetacei, 1988, 1991). Of the 59 Risso's dolphins stranded in France between 1972 and 2003 (including along the Atlantic coast), 2 had ingested plastic bags (Dhermain, 2004).

Those proportions do not reflect actual rates of ingestion because only a minority of the stranded animals were dissected.

Climate change

Some of the effects of global warming have become dramatically apparent in recent years (Pollack et al., 1998; Barnett et al., 2001; IPCC, 2007). Climate change has the potential to affect a range of biological processes and cause significant shifts in marine and other biota (e.g. Peñuelas et al., 2002; Parmesan and Yohe, 2003; Parmesan, 2006; Díaz-Almela et al., 2007). Increased temperature has been observed in Mediterranean deep (Bethoux et al., 1990) and surface waters (Metaxas et al., 1991; Bethoux and Gentili, 1996) and there is increasing evidence of biological responses to such warming (Francour et al., 1994; Díaz-Almela et al., 2007; Philippart, 2007), including disease outbreaks, faunal shifts and spreading of invasive species (Lejeusne et al., 2009).

The effects of climate change on cetaceans, often mediated via changes in prey abundance and distribution, may include shifts in distribution and grouping behaviour (Lusseau et al., 2004; Learmonth et al., 2006; MacLeod, 2009; Simmonds and Eliott, 2009). Deep-water oceanic communities may reorganise in response to ocean warming, with low-latitude losses of diversity and resilience (Whitehead et al., 2008). Climate-driven effects

Table 3
Overview of threats to Risso's dolphins in the Mediterranean Sea, quality information to characterise those threats, and their suspected or inferred impacts at the population level.

Threat	Quality of information	Impact at the population level	Rationale behind assessment/Notes
Incidental mortality and injury in fisheries (*bycatch*). Mortality or injury from accidental entanglement in gear of various types including passive and active nets, longlines, traps and discarded or lost nets and lines and illegal fishing practices (e.g. use of dynamite)	Good	High	Occurrence of stranded animals showing evidence of bycatch in fishing gear
Acoustic pollution (*noise*). Mortality, injury or chronic disturbance from exposure to man-made sounds	Poor	Uncertain	Although exposed to considerable anthropogenic noise, including high-intensity sonars, no evidence of trauma or behavioural disruption reported so far
Ingestion of solid debris. Mortality or injury from the ingestion of foreign objects and materials, such as plastic, wood, textiles etc. (obstructing part of the digestive tract)	Poor	Moderate	Plastic and other debris found in stomachs of several animals, but limited evidence that this was a direct cause of mortality
Chemical contamination. Accumulation in the body tissues (mostly through the food web) of chemicals known to adversely affect mammalian functions and health	Poor	Moderate	Cause–effect relations not demonstrated for most chemicals and for this species, but high levels of some trace metals are a cause for concern
Disturbance. Behavioural disruption through intentional or non-intentional approaches, likely or proven to induce long-term effects on dolphin populations	Poor	Possibly minor, with important exceptions (see relevant section in text)	Inference based on distribution, occurrence of disturbance in those areas, and behaviour shown by the animals
Prey depletion. Depletion of food resources caused directly or indirectly by fishing	Poor	Possibly minor	Inference based on diet and degree of exploitation of key prey; impact may increase in the future
Ecosystem change. Reduced habitat quality due to effects of coastal development (e.g. eutrophication, harmful algal blooms, prey depletion, alien species invasions)	Fair	Minor, except possibly in Risso's dolphin hotspots situated near shore	Inference based on Risso's dolphin distribution and habitat use
Intentional and direct takes. Killing or capture to obtain products for human consumption and shark bait, live capture for display facilities, acts of retaliation for actual or perceived damage to fish catches or gear, and shooting for 'sport'	Fair	Minor	Infrequent observation of relevant wounds on animals found stranded or adrift
Vessel strikes. Accidental mortality or injury from contact with a vessel, particularly the hull or propeller	Fair	Minor	Infrequent observation of relevant wounds or amputations on animals found stranded or adrift
Climate change. Changes in prey availability (abundance or distribution), shifts in distribution of competitors, exposure to novel diseases etc.	Poor	Unknown	No evidence

on Mediterranean ecosystems are likely already occurring (e.g. Gambaiani et al., 2009), but it is uncertain how they might apply to Risso's dolphins. Ocean acidification is also likely to affect marine biodiversity in ways that are poorly understood and difficult to predict for cetaceans (Orr et al., 2005; Whitehead et al., 2008).

The example mentioned earlier involving the replacement of short-finned pilot whales by Risso's dolphins in an area off southern California, coincident with an El Niño event (Shane, 1994, 1995b), may be relevant and instructive. In another instance, changes in species composition and encounter rates of several small odontocetes were observed in Monterey Bay, California, correlated with the El Niño 1997–1998 and La Niña 1999 events. As sea surface temperatures increased in August 1997, species that previously had been virtually absent became conspicuous, including Risso's dolphins (Benson et al., 2002). Such fluctuations in community structure and species composition, likely driven by background climate variability, tend to confound efforts to characterise and quantify the effects on cetaceans and other marine organisms of climate change and processes such as acidification.

Conclusions

The activities and processes that may have negative effects on Risso's dolphins in the Mediterranean Sea, and their relative significance based on present knowledge, are summarised in Table 3. When the quality of information is indicated as 'poor', this means focussed investigations are needed. Research should also be designed to clarify the underlying dynamics of threats judged to have 'high' or 'likely-high' impacts at the population level, in the expectation that appropriate mitigation measures can then be identified and implemented. Data on abundance, distribution, movements, population dynamics and trends as well as better information on threats (e.g. bycatch in fishing gear) are needed to inform conservation efforts and ensure that Risso's dolphins remain a functioning part of marine ecosystems in the Mediterranean region. At every stage, it is important to ensure that the results of research and monitoring are made available to the scientific and conservation communities, preferably in the form of integrated analyses published in the peer-reviewed literature.

Numerous national Marine Protected Areas (MPAs) of many different types, sizes and purposes have been designated in Mediterranean riparian States, but specific measures for cetacean conservation are rarely included in the management plans for such areas. In addition, most MPAs are coastal and do not encompass habitat that would be consistently suitable for Risso's dolphins. A notable exception is the 87,000 km^2 cetacean sanctuary created in 1999 by France, Italy and the Monaco Principality in the Corso-Ligurian-Provençal Basin (the 'Pelagos Sanctuary'; Notarbartolo di Sciara et al., 2008a,b) which is, however, still far from effective as a tool for cetacean conservation (Notarbartolo di Sciara, 2009).

Inclusion of Risso's dolphin habitat in networks of offshore protected areas would be one way of addressing threats to this species in the mid- to long-term. Indeed, various MPAs have been proposed to protect the habitat of deep-water cetacean species (including Risso's dolphin) in Spanish Mediterranean waters (Cañadas et al., 2005; Gómez de Segura et al., 2008) and there are prospects for Specially Protected Areas of Mediterranean Importance (SPAMIs) in areas beyond national jurisdiction (e.g. Notarbartolo di Sciara and Agardy, 2009). If effectively managed, deep-water or offshore protected areas could have long-term conservation benefits for Risso's dolphins. Pending the implementation of such area-based management strategies, any actions taken to mitigate immediate and well-known threats to cetaceans and other large marine vertebrates in the Mediterranean region, particularly entanglement in pelagic gillnets (driftnets), are bound to benefit Risso's dolphins. Considering that driftnetting is already illegal in EU waters, what is most needed is strict enforcement of that ban and its extension to the high seas and to waters under non-EU State jurisdiction.

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References

Aguilar, A., 2000. Population biology, conservation threats and status of Mediterranean striped dolphins (*Stenella coeruleoalba*). J. Cet. Res. Manag. 2, 17–26.
Aguilar, A., Borrell, A., 1994. Abnormally high polychlorinated biphenyl levels in striped dolphins (*Stenella coeruleoalba*) affected by the 1990–1992 Mediterranean epizootic. Sci. Total. Environ. 154, 237–247.
Aguilar, A., Raga, J.A., 1993. The striped dolphin epizootic in the Mediterranean Sea. Ambio 22, 524–528.
Airoldi, S., Bendinoni, F., Azzellino, A., Fadda, V., Profice, A., 2005. Abundance estimates of Risso's dolphins (*Grampus griseus*) in the western Ligurian Sea though photographic mark-recapture. In: Proceedings of the Annual Conference of the European Cetacean Society 19, La Rochelle, France.
Airoldi, S., Azzellino, A., Fadda, V., Gaspari, S., Nani, B., Zanardelli, M., Notarbartolo di Sciara, G., Mariani, M., 2000. Social ecology of Risso's dolphins in the Ligurian Sea: preliminary results. Eur. Res. Cet. 14, 213–217.
Alegre, F., Alonso, J.M., Degollada, E., Lopez, A., 1996. The first Risso's dolphin (*Grampus griseus*) mass stranding described on the Mediterranean coast of the Iberian Peninsula. Eur. Res. Cet. 9, 156.
Aliani, S., Griffa, A., Molcard, A., 2003. Floating debris in the Ligurian Sea, north-western Mediterranean. Mar. Pollut. Bull. 46, 1142–1149.
Alonso, J.M., Lopez, A., Benavente, P., Rodriguez-Lourenzo, J., 1999. One week maintenance of a juvenile Risso's dolphin (*Grampus griseus*) during a rehabilitation attempt on the north-western Iberian Peninsula. Eur. Res. Cet. 13, 398–400.
Au, W.W.L., 1993. The Sonar of Dolphins. Springer-Verlag, New York.
Azzellino, A., Gaspari, S., Airoldi, S., Nani, B., 2008. Habitat use and preferences of cetaceans along the continental slope and the adjacent pelagic waters in the western Ligurian Sea. Deep Sea Res. Part I 55, 296–323.
Azzolin, M., Anichini, M., Galli, A., Papale, E., Giacoma, C., 2010. Evidence of a striped dolphin (*Stenella coeruleoalba*) nursery zone in the waters adjacent to the terrestrial Natura 2000 Area "Gerania Mount" (Gulf of Corinth). In: Proceedings of the Annual Conference of the European Cetacean Society 24, Stralsund, Germany.
Baird, R.W., Hooker, S.K., 2000. Ingestion of plastic and unusual prey by a juvenile harbour porpoise. Mar. Pollut. Bull. 40, 719–720.
Baird, R.W., 2009. Risso's dolphin *Grampus griseus*. In: Perrin, W.F., Würsig, B., Thewissen, J.G.M. (Eds.), Encyclopedia of Marine Mammals, 2nd edition. Academic Press, Amsterdam, pp. 975–976.
Baird, R.W., Stacey, P.J., 1991. Status of Risso's dolphin, *Grampus griseus*, in Canada. Can. Field Nat. 105, 233–242.
Baker, C.S., Lukoschek, V., Lavery, S., Dalebout, M.L., Yong-un, M., Endo, T., Funahashi, N., 2006. Incomplete reporting of whale, dolphin and porpoise 'bycatch' revealed by molecular monitoring of Korean markets. Anim. Conserv. 9, 474–482.
Barlow, J., 2006. Cetacean abundance in Hawaiian waters estimated from a summer/fall survey in 2002. Mar. Mamm. Sci. 22, 446–464.
Barnett, J., Davison, N., Deaville, R., Monies, R., Loveridge, J., Tregenza, N., Jepson, P.D., 2009. Postmortem evidence of interactions of bottlenose dolphins (*Tursiops truncatus*) with other dolphin species in south-west England. Vet. Rec. 165, 441–444.
Barnett, T.P., Pierce, D.W., Schnur, R., 2001. Detection of anthropogenic climate change in the world's oceans. Science 292, 270–274.
Baumgartner, M.F., 1997. The distribution of Risso's dolphin (*Grampus griseus*) with respect to physiography in the northern Gulf of Mexico. Mar. Mamm. Sci. 13, 614–638.
Bearzi, G., Holcer, D., Notarbartolo di Sciara, G., 2004. The role of historical dolphin takes and habitat degradation in shaping the present status of northern Adriatic cetaceans. Aquat. Conserv. 14, 363–379.
Bearzi, G., 2003. At home with the dolphins. In: Frohoff, T., Peterson, B. (Eds.), Between Species: Celebrating the Dolphin–Human Bond. Sierra Club Books, San Francisco, pp. 104–109.
Bearzi, G., 2006. Action Plan for the Conservation of Cetaceans in Libya. Libya's Environment General Authority and Marine Biology Research Center & Regional Activity Centre for Specially Protected Areas, Tunis.
Bearzi, G., Fortuna, C.M., Reeves, R.R., 2008. Ecology and conservation of common bottlenose dolphins *Tursiops truncatus* in the Mediterranean Sea. Mammal Rev. 39, 92–123.
Bearzi, G., Reeves, R.R., Notarbartolo di Sciara, G., Politi, E., Cañadas, A., Frantzis, A., Mussi, B., 2003. Ecology, status and conservation of short-beaked common dolphins *Delphinus delphis* in the Mediterranean Sea. Mammal Rev. 33, 224–252.

Beaubrun, P., David, L., Di Méglio, N., Gannier, A., Gannier, O., 1997. First aerial survey in the north-west Mediterranean: preliminary results. Eur. Res. Cet. 11, 100–103.

Beaubrun, P., Roussel, E., 2000. Ecological indications of cetaceans distribution in the eastern part of the Strait of Gibraltar in spring. Eur. Res. Cet. 14, 313–331.

Bejder, L., Samuels, A., Whitehead, H., Gales, N., Mann, J., Connor, R., Heithaus, M., Watson-Capps, J., Flaherty, C., Krützen, M., 2006. Decline in relative abundance of bottlenose dolphins exposed to long-term disturbance. Conserv. Biol. 20, 1791–1798.

Bello, G., 1992. Stomach contents of a Risso's dolphin, *Grampus griseus*: do dolphins compete with fishermen and swordfish, *Xiphias gladius*? Eur. Res. Cet. 6, 199–202.

Bello, G., Bentivegna, F., 1994. Cephalopod remains from the stomach of a Risso's dolphin, *Grampus griseus* (Cetacea: Delphinidae), stranded along the eastern Tyrrhenian coast. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 135, 467–469.

Benson, S.R., Croll, D.A., Marinovic, B.B., Chavez, F.P., Harvey, J.T., 2002. Changes in the cetacean assemblage of a coastal upwelling ecosystem during El Niño 1997–1998 and La Niña 1999. Prog. Oceanogr. 54, 279–291.

Bethoux, J.P., Gentili, B., 1996. The Mediterranean Sea, coastal and deep-sea signatures of climatic and environmental changes. J. Mar. Sys. 7, 383–394.

Bethoux, J.P., Gentili, B., Raunet, J., Tailliez, D., 1990. Warming trend in the western Mediterranean deep water. Nature 347, 660–662.

Blanco, C., Raduan, M.A., Raga, J.A., 2005. Niche separation of four odontocetes in the western Mediterranean Sea. In: Proceedings of the Annual Conference of the European Cetacean Society 19, La Rochelle, France.

Blanco, C., Raduan, M.A., Raga, J.A., 2006. Diet of Risso's dolphin (*Grampus griseus*) in the western Mediterranean Sea. Sci. Mar. 70, 407–411.

Boutiba, Z., 1994. Cetaceans in Algerian coastal waters. Eur. Res. Cet. 8, 104–106.

Cabezon, O., Resendes, A.R., Domingo, M., Raga, J.A., Agusti, C., Alegre, F., Mons, J.L., Dubey, J.P., Almeria, S., 2004. Seroprevalence of *Toxoplasma gondii* antibodies in wild dolphins from the Spanish Mediterranean coast. J. Parasitol. 90, 643–644.

Cagnolaro, L., Di Natale, A., Notarbartolo di Sciara, G., 1983. Guide per il Riconoscimento delle Specie Animali delle Acque Lagunari e Costiere Italiane. 9. Cetacei. AQ/1/224. Consiglio Nazionale delle Ricerche, Roma.

Caldwell, D.K., Caldwell, M.C., Miller, J.F., 1969. Three brief narrow-band sound emissions by a captive male Risso's dolphin, *Grampus griseus*. Bull. Southern. Calif. Acad. Sci. 68, 252–256.

Camiñas, J.A., Valeiras, J., 2001. Marine turtles, mammals and sea birds captured incidentally by the Spanish surface longline fisheries in the Mediterranean Sea. Rapp. Comm. Int. Expl. Sci. Mer Médit. 36, 248.

Cañadas, A., Sagarminaga, R., de Stephanis, R., Urquiola, E., Hammond, P.S., 2005. Habitat preference modelling as a conservation tool: proposals for marine protected areas for cetaceans in southern Spanish waters. Aquat. Conserv. 15, 495–521.

Cañadas, A., Sagarminaga, R., García-Tiscar, S., 2002. Cetacean distribution related with depth and slope in the Mediterranean waters off southern Spain. Deep Sea Res. Part I 49, 2053–2073.

Cañadas, A.M., Sagarminaga, R., 1997. Preliminary results of photo-identification studies on Risso's dolphins (*Grampus griseus*) undertaken during surveys of cetacean distribution and dynamics along the south-east coast of Spain: 1992–1995. Eur. Res. Cet. 10, 221–224.

Capelli, R., Das, K., Pellegrini, R.D., Drava, G., Lepoint, G., Miglio, C., Minganti, V., Poggi, R., 2008. Distribution of trace elements in organs of six species of cetaceans from the Ligurian Sea (Mediterranean), and the relationship with stable carbon and nitrogen ratios. Sci. Total. Environ. 390, 569–578.

Carlini, R., Pulcini, M., Wurtz, M., 1992. Cephalopods from the stomachs of Risso's dolphins, *Grampus griseus*, (Cuvier, 1812), stranded along the central Tyrrhenian coast. Eur. Res. Cet. 6, 196–198.

Carretta, J.V., Forney, K.A., Lowry, M.S., Barlow, J., Baker, J., Johnston, D., Hanson, B., Muto, M.M., Lynch, D., Carswell, L., 2008. U.S. Pacific Marine Mammal Stock Assessments 2008. NOAA Technical Memorandum NMFS SWFSC 434, http://www.nmfs.noaa.gov/pr/pdfs/sars/po2008.pdf.

Casacci, C., Gannier, A., 2000. Habitat variability and site fidelity of the Risso's dolphin in the north-western Mediterranean: defining a home range for a nomad. Eur. Res. Cet. 14, 19–22.

Cataldini, G., Bello, G., 1987. Sulla cattura e liberazione di un grampo, *Grampus griseus*, nel Mare Ionio. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 128, 344–346.

Centro Studi Cetacei, 1987. Cetacei spiaggiati lungo le coste italiane. I. Rendiconto 1986. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 128, 305–313.

Centro Studi Cetacei, 1988. Cetacei spiaggiati lungo le coste italiane. II. Rendiconto 1987. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 129, 411–432.

Centro Studi Cetacei, 1990. Cetacei spiaggiati lungo le coste italiane. III. Rendiconto 1988. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 130, 269–287.

Centro Studi Cetacei, 1991. Cetacei spiaggiati lungo le coste italiane. IV. Rendiconto 1989. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 131, 413–432.

Centro Studi Cetacei, 1992. Cetacei spiaggiati lungo le coste italiane. V. Rendiconto 1990. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 132, 337–355.

Centro Studi Cetacei, 1994. Cetacei spiaggiati lungo le coste italiane. VI. Rendiconto 1991. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 133, 261–291.

Centro Studi Cetacei, 1995. Cetacei spiaggiati lungo le coste italiane. VII. Rendiconto 1992. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 134, 285–298.

Centro Studi Cetacei, 1996a. Cetacei spiaggiati lungo le coste italiane. VIII. Rendiconto 1993. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 135, 437–450.

Centro Studi Cetacei, 1996b. Cetacei spiaggiati lungo le coste italiane. IX. Rendiconto 1994. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 135, 451–462.

Centro Studi Cetacei, 1997a. Cetacei spiaggiati lungo le coste italiane. X. Rendiconto 1995. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 136, 205–216.

Centro Studi Cetacei, 1997b. Cetacei spiaggiati lungo le coste italiane. XI. Rendiconto 1996. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 137, 135–147.

Centro Studi Cetacei, 1998. Cetacei spiaggiati lungo le coste italiane. XII. Rendiconto 1997. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 139, 213–226.

Centro Studi Cetacei, 2000. Cetacei spiaggiati lungo le coste italiane. XIII. Rendiconto 1998. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 141, 129–143.

Centro Studi Cetacei, 2001. Cetacei spiaggiati lungo le coste italiane. XIV. Rendiconto 1999. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 141, 353–365.

Centro Studi Cetacei, 2002. Cetacei spiaggiati lungo le coste italiane. XV. Rendiconto 2000. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 142, 251–264.

Centro Studi Cetacei, 2003. Cetacei spiaggiati lungo le coste italiane. XVI. Rendiconto 2001. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 144, 151–166.

Centro Studi Cetacei, 2004. Cetacei spiaggiati lungo le coste italiane. XVII. Rendiconto 2002. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 145, 155–169.

Centro Studi Cetacei Onlus e Museo Civico di Storia Naturale di Milano, 2004. Cetacei spiaggiati lungo le coste italiane. XVIII. Rendiconto 2003 (Mammalia). Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 145, 425–437.

Centro Studi Cetacei Onlus e Museo Civico di Storia Naturale di Milano, 2006a. Cetacei spiaggiati lungo le coste italiane. XIX. Rendiconto 2004 (Mammalia). Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 147, 145–157.

Centro Studi Cetacei Onlus e Museo Civico di Storia Naturale di Milano, 2006b. Cetacei spiaggiati lungo le coste italiane. XX. Rendiconto 2005 (Mammalia). Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 147, 325–335.

Clarke, M.R., 1986. Cephalopods in the diet of odontocetes. In: Bryden, M.M., Harrison, R. (Eds.), Research on Dolphins. Claredon, Oxford, U.K, pp. 281–321.

Clarke, M.R., 1996. Cephalopods as prey. III. Cetaceans. Phil. Trans. R. Soc. B 351, 1053–1065.

Chakroun, F., 1994. Status of cetaceans in Tunisian marine waters. Eur. Res. Cet. 8, 107.

Clarke, M.R., Pascoe, P.L., 1985. The stomach contents of a Risso's dolphin (*Grampus griseus*) stranded at Thurlestone, South Devon. J. Mar. Biol. Assoc. U.K. 65, 663–666.

Cockcroft, V.G., Haschick, S.L., Klages, N.T.W., 1993. The diet of Risso's dolphin, *Grampus griseus* (Cuvier, 1812), from the east coast of South Africa. Zeitschrift fur Säugetierekunde 58, 286–293.

Corkeron, P.J., Van Parijs, S.M., 2001. Vocalizations of eastern Australian Risso's dolphins, *Grampus griseus*. Can. J. Zool. 79, 160–164.

Cornaglia, E., Rebora, L., Gili, C., Di Guardo, G., 2000. Histopathological and immunohistochemical studies on cetaceans found stranded on the coast of Italy between 1990 and 1997. J. Vet. Med. A. Physiol. Pathol. Clin. Med. 47, 129–142.

Cornax, M.J., Pardo, E., 2009. Adrift: Swordfish and Driftnets in the Mediterranean Sea. Oceana Europe, Madrid.

Corsolini, S., Focardi, S., Kannan, K., Tanabe, S., Borrell, A., Tatsukawa, R., 1995. Congener profile and toxicity assessment of polychlorinated biphenyls in dolphins, sharks and tuna collected from Italian coastal waters. Mar. Environ. Res. 40, 33–53.

David, L., Di Méglio, N., 1999. First results of summer movements of *Grampus griseus* (Cuvier, 1812) in the north-western Mediterranean Sea. Eur. Res. Cet. 13, 189–194.

Davis, R.W., Fargion, G.S., May, N., Leming, T.D., Baumgartner, M., Evans, W.E., Hansen, L.J., Mullin, K., 1998. Physical habitat of cetaceans along the continental slope in the northcentral and western Gulf of Mexico. Mar. Mamm. Sci. 14, 490–507.

Davis, R.W., Ortega-Ortiz, J.G., Ribic, C.A., Evans, W.E., Biggs, D.C., Ressler, P.H., Cady, R.B., Leben, R.R., Mullin, K.D., Würsig, B., 2002. Cetacean habitat in the northern oceanic Gulf of Mexico. Deep Sea Res. Part I 49, 121–142.

De Stephanis, R., Cornulier, T., Verborgh, P., Salazar Sierra, J., Gimeno, N.P., Guinet, C., 2008. Summer spatial distribution of cetaceans in the Strait of Gibraltar in relation to the oceanographic context. Mar. Ecol. Prog. Ser. 353, 275–288.

Dede, A., Öztürk, B., 2007. Cetacean observations in the Marmara and Aegean Sea in spring season 2005. Rapp. Comm. Int. Expl. Sci. Mer Médit. 38, 455.

Dede, A., Saad, A., Fakhri, M., Öztürk, B., 2009. Cetacean sightings in the eastern Mediterranean Sea during the cruise made in summer 2008. In: Proceedings of the Annual Conference of the European Cetacean Society 23, Istanbul, Turkey.

Derraik, J.G.B., 2002. The pollution of the marine environment by plastic debris: a review. Mar. Pollut. Bull. 44, 842–852.

Dhermain, F., Soulier, L., Bompar, J.M., 2002. Natural mortality factors affecting cetaceans in the Mediterranean Sea. In: Notarbartolo di Sciara, G. (Ed.), Cetaceans of the Mediterranean and Black Seas: State of Knowledge and Conservation Strategies. ACCOBAMS, Monaco, Section 15, 14 pp.

Dhermain, F., 2004. Échouages de cétacés en Méditerranée française: plus de 30 années de suivi: 1972/2003. In: Riddell, M., Gannier, A. (Eds.), Actes de la 13me Conference Internationale sur le Cétacés de la Méditerranée. RIMMO, Nice, pp. 97–105.

Di Méglio, N., David, L., Beaubrun, P., 1999. Spatio-temporal distribution of Risso's dolphin *Grampus griseus* (Cuvier, 1812) in summer in the north-western Mediterranean Sea. Eur. Res. Cet. 13, 195–200.

Di Natale, A., 1995. Driftnets impact on protected species: observers data from the Italian fleet and proposal for a model to assess the number of cetacean in the by-catch. In: ICCAT Collective Volume of Scientific Papers, vol. 44, pp. 255–263.

Di Natale, A., Notarbartolo di Sciara, G., 1994. A review of the passive fishing nets and trap fisheries in the Mediterranean Sea and of the cetacean by-catch. Rep. Int. Whal. Commn 15 (Special Issue), 189–202.

Díaz-Almela, E., Marbà, N., Duarte, C.M., 2007. Consequences of Mediterranean warming events in seagrass (*Posidonia oceanica*) flowering records. Glob. Change Biol. 13, 224–235.

Dizon, A., Baker, C.S., Cipriano, F., Lento, G., Palsbsøll, P., Reeves, R.R., 2000. Molecular Genetic Identification of Whales, Dolphins, and Porpoises. In: Proceedings of Workshop on the Forensic Use of Molecular Techniques to Identify Wildlife Products in the Marketplace, NOAA Technical Memorandum, NOAA TM NMFS SWFSC 286.

Dobler, J.P., 2002. Analysis of shipping patterns in the Mediterranean and Black Seas. CIESM Workshop Monographs 20, 19–28.

Dolar, M.L.L., 1994. Incidental takes of small cetaceans in fisheries in Palawan, central Visayas and northern Mindanao in the Philippines. Rep. Int. Whal. Commn Special Issue 15, 355–363.

Dolar, M.L.L., Perrin, W.F., Taylor, B.L., Kooyman, G.L., Alava, M.N.R., 2006. Abundance and distributional ecology of cetaceans in the central Philippines. J. Cet. Res. Manag. 8, 93–111.

Domingo, M., Obon, E., Alegre, F., Pont, S., Cabezon, O., Degollada, E., 2000. Encephalitis by a toxoplasma-like protozoan parasite in a *Grampus*: a host-parasite relationship without known life cycle. Eur. Res. Cet. 14, 266–267.

Duguy, R., Casinos, A., Di Natale, A., Filella-Cornado, S., Ktari-Chakroun, F., Lloze, R., Marchessaux, D., 1983. Repartition et fréquences des mammifères marins en Méditerranée. Rapp. Comm. Int. Expl. Sci. Mer Médit. 28, 223–230.

Duignan, P.J., House, C., Geraci, J.R., Duffy, N., Rima, B.K., Walsh, M.T., Early, G., St Aubin, D.J., Sadove, S., Koopman, H., 1995. Morbillivirus infection in cetaceans of the western Atlantic. Vet. Microbiol. 44, 241–249.

Fernández, A., Edwards, J.F., Rodríguez, F., de los Monteros, A.E., Herráez, P., Castro, P., Jaber, J.R., Martín, V., Arbelo, M., 2005. Gas and fat embolic syndrome" involving a mass stranding of beaked whales (Family Ziphiidae) exposed to anthropogenic sonar signals. Vet. Pathol. Online 42, 446–457.

Fernández, A., Esperón, F., Herráez, P., de Los Monteros, A.E., Clavel, C., Bernabe, A., Sanchez-Vizcaino, J.M., Verborgh, P., de Stephanis, R., Toledano, F., Bayón, B., 2008. Morbillivirus and pilot whale deaths, Mediterranean Sea. Emerg. Infect. Dis. 14, 792–794.

Fernández, M., Agustí, C., Aznar, F.J., Raga, J.A., 2003. Gastrointestinal helminths of Risso's dolphin *Grampus griseus* from the Western Mediterranean. Dis. Aquat. Organ. 55, 73–76.

Ferretti, F., Myers, R.A., Serena, F., Lotze, H.K., 2008. Loss of large predatory sharks from the Mediterranean Sea. Conserv. Biol. 22, 952–964.

Forcada, J., 1998. Studies in the Assessment of Marine Mammals Populations. Ph.D. Thesis, Universitat de Barcelona, Departament de Biologia Animal, Barcelona, Spain.

Forney, K.A., Barlow, J., 1998. Seasonal patterns in the abundance and distribution of California cetaceans, 1991–1992. Mar. Mamm. Sci. 14, 460–489.

Fortuna, C.M., Canese, S., Giusti, M., Revelli, E., Consoli, P., Florio, G., Greco, S., Romeo, T., Andaloro, F., Fossi, M.C., Lauriano, G., 2007. An insight into the status of the striped dolphins, *Stenella coeruleoalba*, of the southern Tyrrhenian Sea. J. Mar. Biol. Assoc. U.K. 87, 1321–1326.

Fossi, M.C., Marsili, L., 2003. Effects of endocrine disruptors in aquatic mammals. Pure Appl. Chem. 75, 2235–2247.

Fossi, M.C., Marsili, L., Lauriano, G., Fortuna, M.C., Canese, S., Ancora, S., Leonzio, C., Romeo, T., Merino, R., Abad, E., Jiménez, B., 2004. Assessment of toxicological status of a SW Mediterranean segment population of striped dolphin (*Stenella coeruleoalba*) using skin biopsy. Mar. Environ. Res. 58, 269–274.

Francour, P., Boudouresque, C.F., Harmelin, J.G., Harmelin-Vivien, M.L., Quignard, J.P., 1994. Are the Mediterranean waters becoming warmer? Information from biological indicators. Mar. Pollut. Bull. 28, 523–526.

Frantzis, A., Gordon, J., Hassidis, G., Komnenou, A., 2001. The enigma of harbor porpoise presence in the Mediterranean Sea. Mar. Mamm. Sci. 17, 937–944.

Frantzis, A., Alexiadou, P., Paximadis, G., Politi, E., Gannier, A., Corsini-Foka, M., 2003. Current knowledge of the cetacean fauna of the Greek Seas. J. Cet. Res. Manag. 5, 219–232.

Frantzis, A., Herzing, D.L., 2002. Mixed-species associations of striped dolphins (*Stenella coeruleoalba*), short-beaked common dolphins (*Delphinus delphis*), and Risso's dolphins (*Grampus griseus*) in the Gulf of Corinth (Greece, Mediterranean Sea). Aquat. Mamm. 28, 188–197.

Fraser, F.C., 1940. Three anomalous dolphins from Blacksod Bay, Ireland. Proc. Roy. Irish Acad. 45B, 415–455.

Frodello, J.P., Marchand, B., 2001. Cadmium, copper, lead, and zinc in five toothed whale species of the Mediterranean Sea. Int. J. Toxicol. 20, 339–343.

Frodello, J.P., Romeo, M., Viale, D., 2000. Distribution of mercury in the organs and tissues of five toothed-whale species of the Mediterranean. Environ. Pollut. 108, 447–452.

Gambaiani, D.D., Mayol, P., Isaac, S.J., Simmonds, M.P., 2009. Potential impacts of climate change and greenhouse gas emissions on Mediterranean marine ecosystems and cetaceans. J. Mar. Biol. Assoc. U.K. 89, 179–201.

Gannier, A., 2005. Summer distribution and relative abundance of delphinids in the Mediterranean Sea. Revue Ecol. (Terre et Vie) 60, 223–238.

Gaspari, S., 2004. Social and population structure of striped and Risso's dolphins in the Mediterranean Sea. Ph.D. Thesis, University of Durham, School of Biological and Biomedical Sciences, Durham, U.K.

Garrison, L.P., 2007. Interactions between marine mammals and pelagic longline fishing gear in the U. S. Atlantic Ocean between 1992 and 2004. Fish. Bull. 105, 408–417.

Gaspari, S., Airoldi, S., Hoelzel, A.R., 2007. Risso's dolphins (*Grampus griseus*) in U.K. waters are differentiated from a population in the Mediterranean Sea and genetically less diverse. Conserv. Genet. 8, 727–732.

Gaspari, S., Azzellino, A., Airoldi, S., Hoelzel, A.R., 2008. Group size variation and distribution of Risso's dolphins and striped dolphins in the northwest Mediterranean Sea. In: Proceedings of the Annual Conference of the European Cetacean Society 22, Egmond aan Zee, The Netherlands.

Gaspari, S., Natoli, A., 2006. Risso's dolphin *Grampus griseus* (Mediterranean subpopulation). In: Reeves, R.R., Notarbartolo di Sciara, G. (Eds.), The Status and Distribution of Cetaceans in the Black Sea and Mediterranean Sea. IUCN Centre for Mediterranean Cooperation, Malaga, Spain, pp. 29–33.

Goffman, O., Roditi, M., Shariv, T., Spanier, E., Kerem, D., 2000. Cetaceans from the Israeli coast of the Mediterranean Sea. Isr. J. Zool. 46, 143–147.

Gomerčić, H., Gomerčić, M., Gomerčić, T., Lučić, H., Škrtić, D., Ćurković, S., Vuković, S., Huber, D., Gomerčić, V., Bubić Špoljar, J., 2006. Abundance and mortality of Risso's dolphins (Grampus griseus) in the last 15 years in the Croatian part of the Adriatic Sea. In: Proceedings of the 9th Croatian Biological Congress with International Participation, Rovinj, Croatia, pp. 297–298.

Gómez de Segura, A., Hammond, P.S., Raga, J.A., 2008. Influence of environmental factors on small cetacean distribution in the Spanish Mediterranean. J. Mar. Biol. Assoc. U.K. 88, 1185–1192.

Gómez de Segura, A., Crespo, E., Pedraza, S., Hammond, P., Raga, J., 2006. Abundance of small cetaceans in waters of the central Spanish Mediterranean. Mar. Biol. 150, 149–160.

González, A.F., Lopez, A., Valeiras, X., Alonso, J.M., 2000. Foreign bodies found in the digestive tract of marine mammals in north-western Spanish coast. Eur. Res. Cet. 14, 270–271.

Gonzalvo, J., 2009. Action Plan for the Conservation of Cetaceans in Lebanon. ACCOBAMS, Monaco.

Gonzalvo, J., Bearzi, G., 2008. Action Plan for the Conservation of Cetaceans in Syria. Regional Activity Centre for Specially Protected Areas, Tunis.

Hadar, N., Goffman, O., Scheinin, A., Kerem, D., 2008. Summary of reported cetacean strandings along the Israeli Mediterranean coast (1993–2005). In: Proceedings of the Annual Conference of the European Cetacean Society 22, Egmond aan Zee, The Netherlands.

Hall, A.J., McConnell, B.J., Rowles, T.K., Aguilar, A., Borrell, A., Schwacke, L., Reijnders, P.J., Wells, R.S., 2006. Individual-based model framework to assess population consequences of polychlorinated biphenyl exposure in bottlenose dolphins. Environ. Health Perspect. 114, 60–64.

Hanlon, R.T., Messinger, J.B., 1996. Cephalopod Behaviour. Cambridge University Press, Cambridge, U.K.

Hartman, K.L., Geelhoed, S.C.V., Visser, F., Azevedo, J.N., 2009. Temporal residency patterns of Risso's dolphins (*Grampus griseus*) off Pico island, Azores. In: Proceedings of the 18th Biennal Conference on the Biology of Marine Mammals, Quèbec, Canada.

Hartman, K.L., Visser, F., Hendriks, A.J.E., 2008. Social structure of Risso's dolphins (*Grampus griseus*) at the Azores: a stratified community based on highly associated social units. Can. J. Zool. 86, 294–306.

Heithaus, M.R., 2001. Predator-prey and competitive interactions between sharks (order Selachii) and dolphins (suborder Odontoceti): a review. J. Zool. 253, 53–68.

Holcer, D., Wiemann, A., Mackelworth, P., Fortuna, C.M., 2008. Preliminary results on the distribution and abundance of cetaceans in the Croatian southern Adriatic Sea. In: Proceedings of the Annual Conference of the European Cetacean Society 22, Egmond aan Zee, The Netherlands.

IPCC, 2007. Climate change 2007: the physical science basis. In: Summary for Policy Makers. WMO/UNEP Intergovernmental Panel on Climate Change, http://www.ipcc.ch.

IWC, 1980. Report of the workshop. Rep. Int. Whal. Commn Special Issue 3, 1–50.

IWC, 1994. Report of the workshop on mortality of cetaceans in passive fishing nets and traps. Rep. Int. Whal. Commn Special Issue 15, 1–71.

Jefferson, T.A., Leatherwood, S., Webber, M.A., 1993. Marine Mammals of the World. FAO Species Identification Guide. Food and Agricultural Organization of the United Nations, Rome, Italy.

Jepson, P.D., Bennett, P.M., Allchin, C.R., Law, R.J., Kuiken, T., Baker, J.R., Rogan, E., Kirkwood, J.K., 1999. Investigating potential associations between chronic exposure to polychlorinated biphenyls and infectious disease mortality in harbour porpoises from England and Wales. Sci. Total. Environ. 243–244, 339–348.

Jepson, P.D., Deaville, R., Patterson, I.A., Pocknell, A.M., Ross, H.M., Baker, J.R., Howie, F.E., Reid, R.J., Colloff, A., Cunningham, A.A., 2005. Acute and chronic gas bubble lesions in cetaceans stranded in the United Kingdom. Vet. Pathol. 42, 291–305.

Jereb, P., Roper, C.F.E., 2005. Cephalopods of the World: an Annotated and Illustrated Catalogue of Cephalopod Species Known to Date. Volume 1. Chambered nautiluses and sepioids (Nautilidae, Sepiidae, Sepiolidae, Sepiadariidae, Idiosepiidae and Spirulidae). FAO Species Catalogue for Fishery Purposes 4. FAO, Rome.

Kastelein, R.A., Lavaleije, M.S.S., 1992. Foreign bodies in the stomach of a female harbour porpoise (*Phocoena phocoena*) from the North Sea. Aquat. Mamm. 18, 40–46.

Kruse, S., Caldwell, D.K., Caldwell, M.C., 1999. Risso's dolphin *Grampus griseus* (G. Cuvier, 1812). In: Ridgway, S.H., Harrison, R. (Eds.), Handbook of Marine Mammals, vol. 6, The Second Book of Dolphins and Porpoises. Academic Press, San Diego, pp. 183–212.

Kruse, S., Leatherwood, S., Prematunga, W.P., Mendes, C., Gamage, A., 1991. Records of Risso's dolphins, Grampus griseus, in the Indian Ocean, 1891–1986. In: Leatherwood, S., Donovan, G.P. (Eds.), Cetaceans and Cetacean Research in the Indian Ocean Sanctuary. Marine Mammal Technical Report 3. UNEP, Nairobi, Kenya, pp. 67–77.

Ktari-Chakroun, F., 1980. Les cetacés des côtes tunisiennes. Bulletin de l'Institut d'Océanographie et Pêche de Salammbô 7, 139–149.
Laran, S., Gannier, A., Bourreau, S., 2002. Preliminary results on seasonal variation of cetacean population in the Mediterranean Sanctuary. In: Proceedings of the Annual Conference of the European Cetacean Society 16, Liege, Belgium.
Lahvis, G.P., Wells, R.S., Kuehl, D.W., Stewart, J.L., Rhinehart, H.L., Via, C.S., 1995. Decreased lymphocyte responses in free-ranging bottlenose dolphins (*Tursiops truncatus*) are associated with increased concentrations of PCBs and DDT in peripheral blood. Environ. Health. Perspect. 103, 67–72.
Laist, D.W., 1997. Impacts of marine debris: entanglement of marine life in marine debris including a comprehensive list of species with entanglement and ingestion records. In: Coe, J.M., Rogers, D.B. (Eds.), Marine Debris: Sources, Impacts, and Solutions. Springer-Verlag, New York, pp. 99–139.
Laist, D.W., Coe, J.M., O'Hara, K.J., 1999. Marine debris pollution. In: Twiss, J.R., Reeves, R.R. (Eds.), Conservation and Management of Marine Mammals. Smithsonian Institution Press, Washington, pp. 342–366.
Learmonth, J.A., MacLeod, C.D., Santos, M.B., Pierce, G.J., Crick, H.Q.P., Robinson, R.A., 2006. Potential effects of climate change on marine mammals. Oceanogr. Mar. Biol. Ann. Rev. 44, 431–464.
Leatherwood, S., Perrin, W.F., Kirby, V.L., Hubbs, C.L., Dahlheim, M., 1980. Distribution and movements of Risso's dolphin, *Grampus griseus*, in the eastern north Pacific. Fish. Bull. 77, 951–963.
Leatherwood, S., Reeves, R.R., 1989. Marine Mammal Research and Conservation in Sri Lanka 1985–1986. Marine Mammal Technical Report 1. UNEP, Nairobi, Kenya.
Lejeusne, C., Chevaldonné, P., Pergent-Martini, C., Boudouresque, C.F., Pérez, T., 2009. Climate change effects on a miniature ocean: the highly diverse, highly impacted Mediterranean Sea. Trends. Ecol. Evol. 25, 250–260.
Lien, J., Stenson, G.B., Carver, S., Chardine, J., 1994. How many did you catch? The effects of methodology on bycatch reports obtained from fishermen. Rep. Int. Whal. Commn 15 (Special Issue), 535–540.
Lusseau, D., 2003. Effects of tour boats on the behavior of bottlenose dolphins: using Markov chains to model anthropogenic impacts. Conserv. Biol. 17, 1785–1793.
Lusseau, D., 2004. The hidden cost of tourism: detecting long-term effects of tourism using behavioral information. Ecol. Soc. 9 (1), http://www.ecologyandsociety.org/vol9/iss1/art2.
Lusseau, D., Williams, R., Wilson, B., Grellier, K., Barton, T.R., Hammond, P.S., Thompson, P.M., 2004. Parallel influence of climate on the behaviour of Pacific killer whales and Atlantic bottlenose dolphins. Ecol. Lett. 7, 1068–1076.
MacLeod, C.D., 2009. Global climate change, range changes and potential implications for the conservation of marine cetaceans: a review and synthesis. Endang. Spec. Res. 7, 125–136.
Madsen, P.T., Kerr, I., Payne, R., 2004. Echolocation clicks of two free-ranging, oceanic delphinids with different food preferences: false killer whales *Pseudorca crassidens* and Risso's dolphins *Grampus griseus*. J. Exp. Biol. 207, 1811–1823.
Maio, N., 1998. Studio di un grampo *Grampus griseus* (Cuvier, 1812) spiaggiato nel Golfo di Napoli (Cetacea, Delphinidae): considerazioni sulle cause della morte. Atti Soc. It. Sci. nat. Museo Civ. Stor. Nat. Milano 139, 3–12.
Mangion, P., Gannier, A., 2002. Improving the comparative distribution picture for Risso's dolphin and long-finned pilot whale in the Mediterranean Sea. In: Proceedings of the Annual Conference of the European Cetacean Society 16, Liege, Belgium.
Marcer, F., Florio, D., Mazzariol, S., Scaravelli, D., Gustinelli, A., 2008. Parasitological findings in two Risso's dolphins (Grampus griseus) stranded on the Italian Adriatic coast. In: Proceedings of the Annual Conference of the European Cetacean Society 22, Egmond aan Zee, The Netherlands.
Mariani, M., Mussi, B., Miragliuolo, A., Pace, D.S., 2010. Photo-identification of Risso's dolphin (*Grampus griseus*) in the waters off the island of Ischia, Tyrrhenian sea, Italy. In: Proceedings of the Annual Conference of the European Cetacean Society 24, Stralsund, Germany.
Marsili, L., Focardi, S., 1997. Chlorinated hydrocarbon (HCB, DDTs and PCBs) levels in cetaceans stranded along the italian coasts: an overview. Environ. Monitor. Assess. 45, 129–180.
Mazzatenta, A., Scaravelli, D., Genov, T., Zucca, P., 2005. Aging and mortality in bottlenose dolphins (Tursiops truncatus) and Risso's dolphins (Grampus griseus) found beached ashore along the Adriatic Sea coast of Italy and Slovenia. In: Proceedings of the Annual Conference of the European Cetacean Society 19, La Rochelle, France.
Metaxas, D.A., Bartzokas, A., Vitsas, A., 1991. Temperature fluctuations in the Mediterranean area during the last 120 years. Int. J. Climat. 11, 897–908.
Minamikawa, S., Shimada, H., Miyashita, T., Moronuki, H., 2007. Abundance estimates of six species of cetaceans taken by the fishery using sighting data collected in 1998–2001. In: Proceedings of the Autumn Meeting of the Japanese Society of Fisheries Sciences (in Japanese).
Miragliuolo, A., Mussi, B., Bearzi, G., 2004. Risso's dolphin harassment by pleasure boaters off the island of Ischia, central Mediterranean Sea. Eur. Res. Cet. 15, 168–171.
Miyashita, T., 1993. Abundance of dolphin stocks in the western North Pacific taken by the Japanese drive fishery. Rep. Int. Whal. Commn 43, 417–437.
Miyazaki, N., Hirosaki, Y., Kinuta, T., Omura, H., 1992. Osteological study of a hybrid between *Tursiops truncatos* and *Grampus griseus*. Bull. Nat. Sci. Mus. (Japan) Ser. A 18, 79–94.
Morato, T., Watson, R., Pitcher, T.J., Pauly, D., 2006. Fishing down the deep. Fish Fish. 7, 24–34.
Mörzer-Bruyns, W.F.J., 1971. Field Guide of Whales and Dolphins. CA Mees, Amsterdam.
Moulins, A., Rosso, M., Ballardini, M., Würtz, M., 2008. Partitioning of the Pelagos Sanctuary (north-western Mediterranean Sea) into hotspots and coldspots of cetacean distributions. J. Mar. Biol. Assoc. U.K. 88, 1273–1281.
Mussi, B., Gabriele, R., Miragliuolo, A., Battaglia, M., 1999. Cetacean sightings and interactions with fisheries in the archipelago Pontino Campano, south Tyrrhenian Sea, 1991–1995. Eur. Res. Cet. 12, 63–65.
Mussi, B., Miragliuolo, A., 2003. I cetacei della costa nord occidentale dell'isola d'Ischia (Canyon di Cuma). In: Gambi, M.C., De Lauro, M., Jannuzzi, F. (Eds.), Ambiente Marino e Costiero e Territorio delle Isole Flegree (Ischia, Procida e Vivara, Golfo di Napoli): Risultati di uno Studio Multidisciplinare. Memorie dell'Accademia di Scienze Fisiche e Matematiche. Societa Italiana di Scienze, Lettere e Arti in Napoli. Liguori Editore, Napoli, pp. 213–232.
Nachtigall, P.E., Yuen, M.M., Mooney, T.A., Taylor, K.A., 2005. Hearing measurements from a stranded infant Risso's dolphin, *Grampus griseus*. J. Exp. Biol. 208, 4181–4188.
Natoli, A., Birkun, A., Aguilar, A., Lopez, A., Hoelzel, A.R., 2005. Habitat structure and the dispersal of male and female bottlenose dolphins (*Tursiops truncatus*). P. Roy. Soc. B Biol. Sci. 272, 1217–1226.
Natoli, A., Cañadas, A., Vaquero, C., Politi, E., Fernández-Navarro, P., Hoelzel, A., 2008. Conservation genetics of the short-beaked common dolphin (*Delphinus delphis*) in the Mediterranean Sea and in the eastern North Atlantic Ocean. Conserv. Genet. 9, 1479–1487.
Newman, S.J., Smith, S.A., 2006. Marine mammal neoplasia: a review. Vet. Pathol. 43, 865–880.
Nixon, M., Young, J.Z., 2003. The Brains and Lives of Cephalopods. Oxford University Press, Oxford, U.K.
NMFS, 2004. Evaluating Bycatch: a National Approach to Standardized Bycatch Monitoring Programs. NOAA Technical Memorandum, NMFS F/SPO 66, http://spo.nmfs.noaa.gov/tm.
Norris, K.S., Prescott, J.H., 1961. Observations on Pacific cetaceans of Californian and Mexican waters, vol. 63. University of California Publications in Zoology, pp. 291–402.
Northridge, S.P., 1996. A Review of Marine Mammal Bycatch Observer Schemes with Recommendations for Best Practice. Joint Nature Conservation Committee Report 219, Aberdeen, U.K.
Northridge, S.P., Fortuna, M.C., 2008. Draft Protocol for Data Collection on Bycatch and Depredation in the ACCOBAMS Region. In: International Workshop on Bycatch within the ACCOBAMS Area. FAO, Rome, Italy.
Notarbartolo di Sciara, G., 1987. Killer whale, *Orcinus orca*, in the Mediterranean Sea. Mar. Mamm. Sci. 3, 356–360.
Notarbartolo di Sciara, G., Venturino, M.C., Zanardelli, M., Bearzi, G., Borsani, F.J., Cavalloni, B., 1993. Cetaceans in the central Mediterranean Sea: distribution and sighting frequencies. Ital. J. Zool. 60, 131–138.
Notarbartolo di Sciara, G., 1990. A note on the cetacean incidental catch in the Italian driftnet swordfish fishery, 1986–1988. Rep. Int. Whal. Commn 40, 459–460.
Notarbartolo di Sciara, G., 2009. The Pelagos Sanctuary for the Conservation of Mediterranean Marine Mammals: An iconic High Seas MPA in Dire Straits. 2nd International Conference on Progress in Marine Conservation in Europe, 2–6 November 2009, Ozeaneum/DMM, Stralsund, Germany.
Notarbartolo di Sciara, G., Agardy, T., 2009. Final overview of scientific findings and criteria relevant to identify SPAMIs in the Mediterranean Areas beyond National Jurisdiction. Regional Activity Centre for Specially Protected Areas, Tunis.
Notarbartolo di Sciara, G., Bearzi, G., 2005. Research on cetaceans in Italy. In: Cozzi, B. (Ed.), Marine Mammals of the Mediterranean Sea: Natural History, Biology, Anatomy, Pathology, Parasitology. Massimo Valdina Editore, Milano.
Notarbartolo di Sciara, G., Demma, M., 2004. Guida dei Mammiferi Marini del Mediterraneo. Franco Muzzio Editore, Padova.
Notarbartolo di Sciara, G., Agardy, T., Hyrenbach, D., Scovazzi, S., Van Klaveren, P., 2008a. The Pelagos Sanctuary for Mediterranean marine mammals. Aquat. Conserv. 18, 367–391.
Notarbartolo di Sciara, G., Agardy, T., Hyrenbach, D., Scovazzi, T., Van Klaveren, P., 2008b. The Pelagos Sanctuary for Mediterranean marine mammals. Aquat. Conserv. 18, 367–391.
Nowacek, D.P., Thorne, L.H., Johnston, D.W., Tyack, P.L., 2007. Responses of cetaceans to anthropogenic noise. Mammal Rev. 37, 81–115.
O'Hara, T.M., O'Shea, T.J., 2001. Toxicology. In: Dierauf, L.S., Gulland, F.M.D. (Eds.), CRC Handbook of Marine Mammal Medicine, 2nd edition. CRC Press, Boca Raton, Florida, pp. 471–520.
Orr, J.C., Fabry, V.J., Aumont, O., Bopp, L., Doney, S.C., et al., 2005. Anthropogenic ocean acidification over the twenty-first century and its impact on calcifying organisms. Nature 437, 681–686.
Orsi Relini, L., Garibaldi, F., Poggi, R., 1997. Note sull'alimentazione del grampo in Mar Ligure. Convegno Nazionale sui Cetacei 3, Napoli, Italy.
Oudejans, M.G., Visser, F., Hartman, K.L., Hendriks, A.J.E., 2007. High whale watch vessel abundance affects the daily resting patterns of Risso's dolphin. In: Proceedings of the Annual Conference of the European Cetacean Society 21, San Sebastian, Spain.
Öztürk, B., Dede, A., Tonay, A., 2009. Cetacean surveys in the Istanbul (Bosphorous) Strait in 2007–2008. In: Proceedings of the Annual Conference of the European Cetacean Society 23, Istanbul, Turkey.
Öztürk, B., Öztürk, A.A., Dede, A., 2001. Dolphin bycatch in the swordfish driftnet fishery in the Aegean Sea. Rapp. Comm. Int. Expl. Sci. Mer Médit. 36, 308.
Öztürk, B., Salman, A., Öztürk, A.A., Tonay, A., 2007. Cephalopod remains in the diet of striped dolphins (*Stenella coeruleoalba*) and Risso's dolphins (*Grampus griseus*) in the eastern Mediterranean Sea. Vie Milieu 57, 53–59.

Pace, D.S., Miragliuolo, A., Mussi, B., 2008. Behaviour of a social unit of sperm whales (*Physeter macrocephalus*) entangled in a driftnet off Capo Palinuro (Southern Tyrrhenian Sea, Italy). J. Cet. Res. Manag. 10, 131–135.

Panigada, S., Gianni, A., Notarbartolo di Sciara, G., Lauriano, G., 2009. Abundance of striped dolphins in the Pelagos Sanctuary: insights through line transect surveys. In: Proceedings of the Annual Conference of the European Cetacean Society 23, Istanbul, Turkey.

Panigada, S., Lauriano, G., Burt, L., Pierantonio, N., Donovan, G., 2010. Monitoring winter and summer abundance of cetaceans in the Pelagos Sanctuary through aerial surveys for conservation. In: Proceedings of the Annual Conference of the European Cetacean Society 24, Stralsund, Germany.

Parmesan, C., 2006. Ecological and evolutionary responses to recent climate change. Annu. Rev. Ecol. Evol. S. 37, 637–669.

Parmesan, C., Yohe, G., 2003. A globally coherent fingerprint of climate change impacts across natural systems. Nature 421, 37–42.

Pauly, D., Palomares, M.L., 2005. Fishing down marine food webs: it is far more pervasive than we thought. Bull. Mar. Sci. 76, 197–212.

Pauly, D., Christensen, V.V., Dalsgaard, J., Froese, R., Torres Jr., F., 1998. Fishing down marine food webs. Science 279, 860–863.

Peñuelas, J., Filella, I., Comas, P.E., 2002. Changed plant and animal life cycles from 1952 to 2000 in the Mediterranean region. Global Change Biol. 8, 531–544.

Pereira, J.N.D.S.G., 2008. Field notes on Risso's dolphin (*Grampus griseus*) distribution, social ecology, behaviour, and occurrence in the Azores. Aquat. Mamm. 34, 426–435.

Perrin, W.F., Reilly, S.B., 1984. Reproductive parameters of dolphins and small whales of the family Delphinidae. Rep. Int. Whal. Commn Special Issue 6, 97–133.

Perrin, W.F., Reeves, R.R., Dolar, M.L.L., Jefferson, T.A., Marsh, H., Wang, J.Y., Estacion, J., 2005. Report of the Second Workshop on the Biology and Conservation of Small Cetaceans and Dugongs of South-east Asia, Silliman University, Dumaguete City, Philippines, 24–26 July, 2002. Convention on Migratory Species Technical Series Publication 9.

Philippart, C.J.M., 2007. Impacts of Climate Change on the European Marine and Coastal Environment: Ecosystems Approach. European Science Foundation, Marine Board Position Paper 9.

Philips, J.D., Nachtigall, P.E., Au, W.W., Pawloski, J.L., Roitblat, H.L., 2003. Echolocation in the Risso's dolphin, *Grampus griseus*. J. Acoust. Soc. Am. 113, 605–616.

Podestà, M., Meotti, C., 1991. The stomach contents of a Cuvier's beaked whale *Ziphius cavirostris*, and Risso's dolphin *Grampus griseus*, stranded in Italy. Eur. Res. Cet. 5, 58–61.

Politou, C.Y., Kavadas, S., Mytilineou, C., Tursi, A., Carlucci, R., Lembo, G., 2003. Fisheries resources in the deep waters of the eastern Mediterranean (Greek Ionian Sea*)*. J. Northwest Atl. Fish. Sci. 31, 35–46.

Pollack, H.N., Huang, S., Shen, P.Y., 1998. Climate change record in subsurface temperatures: a global perspective. Science 282, 279–281.

Poncelet, E., Van Canneyt, O., Boubert, J.J., 2000. Considerable amount of plastic debris in the stomach of a Cuvier's beaked whale (*Ziphius cavirostris*) washed ashore on the French Atlantic coast. Eur. Res. Cet. 14, 44–47.

Praca, E., Gannier, A., 2007. Ecological niche of three teuthophageous odontocetes in the northwestern Mediterranean Sea. Ocean Sci. 4, 785–815.

Pribanic, S., Holcer, D., Miokovic, D., 1999. First report of plastic ingestion by striped dolphin (*Stenella coeruleoalba*) in the Croatian part of the Adriatic Sea. Eur. Res. Cet. 13, 443–446.

Raduán, A., Blanco, C., Fernández, M., Raga, J.A., 2007. Some aspects of the life history of the Risso's dolphins *Grampus griseus* (Cuvier, 1812) in the western Mediterranean Sea. In: Proceedings of the Annual Conference of the European Cetacean Society 21, San Sebastian, Spain.

Raga, J.A., Banyard, A., Domingo, M., Corteyn, M., Van Bressem, M.F., Fernandez, M., Aznar, F.J., Barrett, T., 2008. Dolphin morbillivirus epizootic resurgence. Mediterranean Sea. Emerg. Infect. Dis. 14, 471–473.

Read, A.J., Murray, K.T., 2000. Gross Evidence of Human-induced Mortality in Small Cetaceans. NOAA Technical Memorandum NMFS OPR 15.

Reeves, R.R., Notarbartolo di Sciara, G., 2006. The Status and Distribution of Cetaceans in the Black Sea and Mediterranean Sea. IUCN Centre for Mediterranean Cooperation, Malaga, Spain.

Resendes, A.R., Almería, S., Dubey, J.P., Obón, E., Juan- Sallés, C., Degollada, E., Alegre, F., Cabezón, O., Pont, S., Domingo, M., 2002. Disseminated toxoplasmosis in a Mediterranean pregnant Risso's dolphin (*Grampus griseus*) with transplacental fetal infection. J. Parasitol. 88, 1029–1032.

Reynolds III, J.E., Marsh, H., Ragen, T.J., 2009. Marine mammal conservation. Endang. Spec. Res. 7, 23–28.

Richardson, W.J., Green, C.R.J., Malme, C.I., Thomson, D.H., 1995. Marine Mammals and Noise. Academic Press, San Diego.

Roper, C.F.E., Young, R.E., 1975. Vertical distribution of pelagic Cephalopods. Smithson. Contrib. Zool. 209, 1–47.

Rosel, P.E., Frantzis, A., Lockyer, C., Komnenou, A., 2003. Source of Aegean Sea harbour porpoises. Mar. Ecol. Prog. Ser. 247, 257–261.

Sala, E., Aburto-Oropeza, O., Reza, M., Paredes, G., López-Lemus, L.G., 2004. Fishing down coastal food webs in the Gulf of California. Fisheries 29, 19–25.

Schwacke, L.H., Voit, E.O., Hansen, L.J., Wells, R.S., Mitchum, G.B., Hohn, A.A., Fair, P.A., 2002. Probabilistic risk assessment of reproductive effects of polychlorinated biphenyls on bottlenose dolphins (*Tursiops truncatus*) from the Southeast United States Coast. Environ. Toxicol. Chem. 21, 2752–2764.

Shane, S.H., 1994. Occurrence and habitat use of marine mammals at Santa Catalina Island, California from 1983–1991. Bull. South. Calif. Acad. Sci. 93, 113–129.

Shane, S.H., 1995a. Behavior patterns of pilot whales and Risso's dolphins off Santa Catalina Island, California. Aquat. Mamm. 21, 195–197.

Shane, S.H., 1995b. Relationship between pilot whales and Risso's dolphins at Santa Catalina Island, California, USA. Mar. Ecol. Prog. Ser. 123, 5–11.

Shelden, K.E.V., Baldridge, A., Withrow, D.E., 1995. Observations of Risso's dolphins, *Grampus griseus*, with gray whales, *Eschrichtius robustus*. Mar. Mamm. Sci. 11, 231–240.

Shimura, E., Numachi, K., Sezaki, K., Hirosaki, Y., Watabe, S., Hashimoto, K., 1986. Biochemical evidence of hybrid formation between the two species of dolphin *Tursiops truncatus* and *Grampus griseus*. Bull. Jap. Soc. Sci. Fish. 52, 725–730.

Shoham-Frider, E., Amiel, S., Roditi-Elasar, M., Kress, N., 2002. Risso's dolphin (*Grampus griseus*) stranding on the coast of Israel (eastern Mediterranean): autopsy results and trace metal concentrations. Sci. Total. Environ. 295, 157–166.

Simmonds, M.P., Eliott, W.J., 2009. Climate change and cetaceans: concerns and recent developments. J. Mar. Biol. Assoc. U.K. 89, 203–210.

Soldevilla, M.S., Wiggins, S.M., Hildebrand, J.A., 2010. Spatial and temporal patterns of Risso's dolphin echolocation in the Southern California Bight. J. Acoust. Soc. Am. 127, 124–132.

Stanzani, G., Stanzani, A.L., Angelini, M., Hartmann, M.G., Fichtel, L., Gojceta, R., Affronte, M., 2006. Rehabilitation of an orphaned Risso's dolphin calf (Grampus griseus): case report and its value for conservation. In: Proceedings of the ADRIA-Watch Conference 'Cetaceans, sea turtles and sharks of the Adriatic Sea', 27–28 October 2006. Cattolica, Italy.

Storelli, M.M., Marcotrigiano, G.O., 2000. Persistent organochlorine residues in Risso's dolphins (*Grampus griseus*) from the Mediterranean Sea (Italy). Mar. Pollut. Bull. 40, 555–558.

Storelli, M.M., Zizzo, N., Marcotrigiano, G.O., 1999. Heavy metals and methylmercury in tissues of Risso's dolphin (*Grampus griseus*) and Cuvier's beaked whale (*Ziphius cavirostris*) stranded in Italy (south Adriatic Sea). Bull. Environ. Contam. Toxicol. 63, 703–710.

Tarpley, R.J., Marwitz, S., 1993. Plastic debris ingestion by cetaceans along the Texas coast: two case reports. Aquat. Mamm. 19, 93–98.

Taylor, B.L., Baird, R., Barlow, J., Dawson, S.M., Ford, J., Mead, J.G., Notarbartolo di Sciara, G., Wade, P., Pitman, R.L., 2008. *Grampus griseus*. In: IUCN (Ed.), IUCN Red List of Threatened Species, Version 2009, p. 2, http://www.iucnredlist.org.

Taylor, B.L., Chivers, S.J., Larese, J.P., Perrin, W.F., 2007. Generation length and percent mature estimates for IUCN Assessments of Cetaceans. Southwest Fisheries Science Center Administrative Report LJ-07-01.

Tonay, M.A., Dede, A., Öztürk, A.A., Öztürk, B., 2009. Cetacean strandings in the Turkish Straits System (TSS) and the northern Aegean Sea coast of Turkey during 1999–2008. In: Proceedings of the Annual Conference of the European Cetacean Society 23, Istanbul, Turkey.

Tsur, I., Yakobson, B., Elad, D., Moffett, D., Kennedy, S., 1997. Morbillivirus infection in a bottlenose dolphin from the Mediterranean Sea. Europ. J. Vet. Path. 3, 83–85.

2009. Progress Report on the Mediterranean Database of Cetacean Strandings (MEDACES). Universitat de Valencia, Spain, http://medaces.uv.es/.

Valeiras, J., Camiñas, J.A., 2002. Incidental captures of marine mammals by drifting longline fisheries at western Mediterranean Sea. In: Proceedings of the Annual Conference of the European Cetacean Society 16, Liege, Belgium.

Valeiras, J., Camiñas, J.A., 2003. The incidental capture of seabirds by Spanish drifting longline fisheries in the western Mediterranean Sea. Sci. Mar. 67, 65–68.

Van Bressem, M.F., Visser, I.K., Van de Bildt, M.W., Teppema, J.S., Raga, J.A., Osterhaus, A.D., 1991. Morbillivirus infection in Mediterranean striped dolphins (*Stenella coeruleoalba*). Vet. Rec. 129, 471–472.

Van de Bildt, M.W., Martina, B.E., Sidi, B.A., Osterhaus, A.D., 2001. Morbillivirus infection in a bottlenosed dolphin and a Mediterranean monk seal from the Atlantic coast of West Africa. Vet. Rec. 148, 210–211.

Van Waerebeek, K., Ofori-Danson, P.K., Debrah, J., 2009. The cetaceans of Ghana: a validated faunal checklist. W. Afr. J. Appl. Ecol. 15, http://www.wajae.org/papers/papers_vol15/the_cetaceans_of_ghana_full.pdf.

Vella, A., 1999a. Cetacean research and conservation around the Maltese Islands. Eur. Res. Cet. 13, 274.

Vella, A., 1999b. Cetacean surveys around the Maltese Islands and Maltese sea-user cetacean questionnaire study. Eur. Res. Cet. 12, 66–73.

Villalba, N., Segura, A., Cañadas, A.M., 2000. Preliminary results of the first survey of cetaceans in the north central Alboran Sea. Eur. Res. Cet. 14, 347–351.

Visser, F., Hartman, K.L., Rood, E.J.J., Hendriks, A.J.E., 2006. Effects of whale watching activities on Risso's dolphin resting behaviour at the Azores. In: Proceedings of the Annual Conference of the European Cetacean Society 20, Gdynia, Poland.

Wade, P.R., Gerrodette, T., 1993. Estimates of cetacean abundance and distribution in the Eastern Tropical Pacific. Rep. Int. Whal. Commn 43, 477–493.

Walker, W.W., Coe, J.M., 1990. Survey of marine debris ingestion by odontocete cetaceans. In: Shomura, R.S., Godfrey, H.L. (Eds.), Proceedings of the Second International Conference on Marine Debris, vol. 154. 2–7 April 1989. Honolulu, Hawaii, pp. 747–774, NOAA Technical Memorandum, NOAA TM NMFS SWFSC.

Wang, J.Y., Yang, S.C., 2006. Unusual cetacean stranding events of Taiwan in 2004 and 2005. J. Cet. Res. Manag. 8, 283–292.

Waring, G.T., Josephson, E., Fairfield, C.P., Maze-Foley, K., 2009. US Atlantic and Gulf of Mexico Marine Mammal Stock Assessments 2008. In: NOAA Technical Memorandum NMFS-NE-210, http://www.nefsc.noaa.gov/publications/tm/tm210/tm210.pdf.

Wells, R.S., Manire, C.A., Byrd, L., Smith, D.R., Gannon, J.G., Fauquier, D., Mullin, K., 2009. Movements and dive patterns of a rehabilitated Risso's dolphin, *Grampus griseus*, in the Gulf of Mexico and Atlantic Ocean. Mar. Mamm. Sci. 25, 420–429.

Whitehead, H., McGill, B., Worm, B., 2008. Diversity of deep-water cetaceans in relation to temperature: implications for ocean warming. Ecol. Lett. 11, 1198–1207.
Wolfe, D.A., 1987. Persistent plastics and debris in the ocean: an international problem of ocean disposal. Mar. Pollut. Bull. 18, 303–305.
Würsig, B., Würsig, M., 1980. Behaviour and ecology of dusky porpoises, *Lagenorhynchus obscurus*, in the South Atlantic. Fish. Bull. 77, 871–890.
Würtz, M., Poggi, R., Clarke, M.R., 1992. Cephalopods from the stomachs of a Risso's dolphin (*Grampus griseus*) from the Mediterranean. J. Mar. Biol. Assoc. U.K. 72, 861–867.
Yen, P.P.W., Sydeman, W.J., Hyrenbach, K.D., 2004. Marine bird and cetacean associations with bathymetric habitats and shallow-water topographies: implications for trophic transfer and conservation. J. Mar. Sys. 50, 79–99.
Zucca, P., Di Guardo, G., Pozzi-Mucelli, R., Scaravelli, D., Francese, M., 2004. Use of computer tomography for imaging of *Crassicauda grampicola* in a Risso's dolphin (*Grampus griseus*). J. Zoo. Wildl. Med. 35, 391–394.
Zucca, P., Di Guardo, G., Francese, M., Scaravelli, D., Genov, T., Mazzatenta, A., 2005. Causes of stranding in four Risso's dolphins (*Grampus griseus*) found beached along the North Adriatic Sea coast. Vet. Res. Commun. 29, 261–264.