Historical review of dolphin bounty hunting in Italy with a focus on the period 1927–37

ELEONORA MELIADÒ1, GIORGIO BAVESTRELLO2, GUIDO GNONE3 AND RICCARDO CATTANEO-VIETTI2

Contact e-mail: giorgio.bavestrello@unige.it

ABSTRACT

Dolphins were first formally considered as a ‘pest’ species in the Mediterranean Sea in the late 19th century as they frequently disrupted fishing activities. Numerous fishing organisations/syndicates requested permission to hunt dolphins and the killing of dolphins was allowed by a number of national laws. This paper provides an overview of the hunting of dolphins in Italy across 14 Italian Maritime Compartments, mainly from 1927–1937. It summarises governmental measures implemented, numbers of individuals killed and their monetary value in accordance with the bounty system; official records reveal over 7,200 dolphins (species not specified) killed during the 11-year period and approximately 400,000 Italian Liras (= 355,000 EUR in today’s money) was paid out. In addition to the bounty, the meat was either consumed or sold, making dolphin hunting a profitable activity. The lack of information on species identity and the size of dolphin populations around the Italian coast at that time make it difficult to estimate the population level impact of ‘bounty fishing’, but it is possible that it had a significant impact.

KEYWORDS: DIRECT CAPTURE; DOLPHINS; HISTORICAL DATA; MANAGEMENT PROCEDURES; MEDITERRANEAN

INTRODUCTION

Dolphins were often celebrated in early cultures and even considered to be messengers of the gods in some parts of the world (e.g. see references in Catton, 1995). In the fishing world, the presence of dolphins was often seen as a good omen (Brunelli, 1932; Donati and Pasini, 1997; 1999; Faber, 1883) and there are many stories of collaboration between fishers and dolphins even as far back as Pliny the Elder who described ‘cooperative fishing’ of mullets by humans and dolphins along the Mediterranean French coast. Similar associations have been reported in other parts of the Mediterranean, such as the Güllük Gulf, Turkey and Spain (see Orams, 1997 for a review). In recent times, there have been examples of cooperative fishing between dolphins and indigenous communities, both in coastal ocean and river sites (Zappes et al., 2011).

In parts of the Mediterranean (e.g. the Gulf of Naples), the short-beaked common dolphin (Delphinus delphis, L., 1758) incidentally ‘assisted’ fishing operations where observations of the dolphins herding and then feeding on anchovies and sardines provided a signal for the setting of purse seines. However, the relationship between dolphins and fishers was/is not always perceived as positive by the latter. For example, in the Gulf of Naples, striped (Stenella coeruleoalba, Meyen, 1833) and bottlenose dolphins (Tursiops truncatus, Montagu, 1821) often appeared attracted to fishing operations as a convenient source of food, damaging gear (especially trammel and gillnets) and allowing the fish to escape or damaging the fish and reducing their value. Dolphin presence could lead to the abandonment of fishing for the day for fear of damage to the nets as lacerated nets took time to repair and meant further loss of hours at sea (Bearzi, 2002; Notarbartolo di Sciara and Bearzi, 2002). In addition, dolphins were perceived as direct competitors for resources (Bearzi et al., 2010). Lauriano et al. (2004) discuss ongoing problems with bottlenose dolphins in an artisanal fishery in Sardinia.

In many areas, including parts of the Mediterranean, by the end of the 19th century the actual or perceived damage to fishing caused by dolphins led to calls for them to be treated as a ‘pest’ and culled; in certain areas and periods, this led to support for the killing of dolphins and even the establishment of incentives (bounties) by national and/or regional authorities. The first record of a monetary reward for killing a dolphin in the Adriatic Sea dates back to 1872 (Crnkovic, 1958), whilst from as early as 1865, the French Government offered 25 Francs for each dolphin killed (Duguy et al., 1983; Perrier, 1889).

Such encouragement was also present in Italy for a long period of time. Indeed, Italian law on the ‘Rules of the Maritime Fishery’ (n.963/1965) still permitted the use of harpoon guns on cetaceans for ‘recreational’ fishing activities, and a Ministerial Decree (31 December 1979) continued to allow the killing of dolphins under special authorisation by the Ministry of Merchant Marine. A ban on dolphin capture and the full protection of cetaceans, marine turtles and sturgeons was implemented in 1980, after a Decree of the Ministry of Merchant Marine (Cagnolaro et al., 1983), following Italy’s adherence to CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) on 31 December 1979.

This paper summarises the available information on dolphin bounty hunting in Italy with a focus on official records available for the period 1927–37 for the 14 Compartimenti Marittimi hereafter Compartimenti (see Fig.1).
MATERIALS AND METHODS

Information regarding the actions taken to control dolphin populations was obtained from the Reports of the Italian Ministry of Agriculture, Industry and Commerce (1903; 1905) and a literature review incorporating Faber (1883), Perrier (1889), Brusina (1889), Barone (1895), Ninni (1901), Issel (1903), Del Rosso (1905), Levi-Morenos (1905), Brunelli (1932), Maggioli (1941), Cirillo (1942) and Lopez (1948).

Data concerning the landings (in terms of number of caught dolphins) and the respective economic value (in terms of bounties paid by the authorities) were extracted from the Reports of the Italian Ministry of the National Economy (1927–37) and the Central Institute of Statistics. These data (Table 1) are available for the 14 Compartimenti shown in Fig. 1: Genoa (Liguria); Leghorn (Tuscany); Anzio (Latium); Naples (Campania); Reggio (Calabria); Catania and Palermo (Sicily); Cagliari (Sardinia); Bari (Apulia); Ancona (Marche); Chioggia and Venice (Veneto); Trieste (Venezia Giulia); and Kvarner Gulf (Istrian Peninsula).

Data regarding the number of catches in the Kvarner Gulf (Croatia) from 1914–1925 were reported by D’Ancona (1926).

Data from 1946–1980 regarding the Chioggia Compartimento were obtained from the database of Padua University (https://chioggia.biologia.unipd.it/banche-dati/banca-dati-del-pescato/1945-oggi/). These data were expressed in tonnes per year rather than individuals. For bottlenose dolphins, Sharir et al. (2011) evaluated for Spanish, French and Israel specimens, average lengths of 313, 317 and 272cm respectively. Using the ratio between length and weight proposed by Ridgway and Fenner (1982), ranging from 0.58 to 0.65kg/cm, the estimated average weight of bottlenose dolphins ranges from 163 to 190kg. On the other hand, the weight of an adult striped dolphin ranges from 70 to 90kg (Di Meglio et al., 1996). Unfortunately, no data were available about the species composition of the killed dolphins in the Chioggia Compartimento but, whilst recognising the considerable uncertainty, we believe it is reasonable to assume an average weight per dolphin of 150kg.

RESULTS

Bounty hunting

The disruptive actions of dolphins including taking fish from nets and causing severe damage to fishing gear, affecting income and sustenance, provoked widespread anger and discontent in fishing communities; dolphins were regarded as ‘evil animals’ that prevented fishers from obtaining sufficient income and sustenance (Issel, 1903). In Italy, several systematic ‘culls’ of dolphins were organised (Bearzi et al., 2004). The animosity towards dolphins was tremendous, mainly in the Adriatic Sea, until at least the early 1960s, when, as discussed below, perceptions began to
change (Bearzi, 2002; Cuculí, 1960; Marelic, 1961; Northridge and Hofman, 1999; Peksdörfer-Srica, 1931).

As early as 1868, Mr. Merello, mayor of Portofino (the name of this village derives from the Latin portus delphini, meaning dolphin harbour) claimed that the number of dolphins in the Gulf of Genoa had increased so much as to threaten the fishing economy of the region and in particular that the cost of repairing damaged nets absorbed almost all economic gain. He asked the Government for a reward of 10,000 Italian Liras (= 47 EUR in today’s money) for every dolphin killed, although it was not approved. Similarly, in 1880, the mayors of the villages of the Western Ligurian Riviera offered a prize for whoever made an economic and easy-to-use weapon for hunting dolphins; a bomb gun developed by Alexander Henry of Edinburgh sold for 15 pounds (≈ 1900 EUR in today’s money). In 1889, the Government’s Fisheries Consultative Commission approved, for the first time, the proposal to distribute rifles on loan to fishing syndicates (provided that he was a member of a syndicate) who killed a dolphin and provided proof. In addition, the Government granted each syndicate an initial grant of 30,000 Italian Liras and an annual contribution of 10,000 Italian Liras to assist running costs.

The ‘dolphin management’ problem escalated in 1904 when David Levi-Morenos from the Lega Navale of Venice, reported on the damages declared by the fishermen for the Compartmenti of Venice and Ancona, calculable in ‘several thousand’ Italian Liras (Levi-Morenos, 1905). The Levi-Morenos report also described the many methods used around Europe to kill dolphins, including the use of light sources to attract dolphins to make them easier to kill, the use of dynamite, torpedoes, spear-harpoons, other armed throwing weapons (e.g. bolases) and forced stranding techniques (Levi-Morenos, 1905). A strong debate ensued in the Fisheries Consultative Commission, since not all the experts present were in agreement with the report and some doubted the veracity of the fishermen’s testimonies, considering them to be exaggerated. The Fisheries Consultative Commission postponed a decision on a proposal to distribute rifles on loan to fishing syndicates and to encourage recreational dolphin hunting to limit populations. However, in 1904 a law was passed called ‘Provisions in favour of fishing and fishermen’ (n. 378, 11 July 1904), that promised a reward to every fisherman (provided that he was a member of a syndicate) who killed a dolphin and provided proof. In addition, the Government granted each syndicate an initial grant of 30,000 Italian Liras and an annual contribution of 10,000 Italian Liras to assist their fishing operations.

The request for rifles was reiterated and refused again in 1913 when the Sindacato Peschereccio Ligure-Sardo (Ligurian-Sardinian Fishery Syndicate) in Genoa decided to ask the Italian government not only for bounties, but also for rifles to be distributed to the fishing syndicates (Cattaneo-Viatti and Bava, 2009; Pellerano, 2014; Poggi, 1986).

Table 1

Data of annual total landed specimens (n) and bounties paid in Italian Lira (L). The values in parenthesis are the numbers of killed pregnant females reported.

<table>
<thead>
<tr>
<th>Comp.</th>
<th>1927</th>
<th>1928</th>
<th>1929</th>
<th>1930</th>
<th>1931</th>
<th>1932</th>
<th>1933</th>
<th>1934</th>
<th>1935</th>
<th>1936</th>
<th>1937</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genoa</td>
<td>n</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Leghorn</td>
<td>n</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Anzio</td>
<td>n</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Naples</td>
<td>n</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Reggio C.</td>
<td>n</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Catania</td>
<td>n</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Palermo</td>
<td>n</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Cagliari</td>
<td>n</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Bari</td>
<td>n</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Ancona</td>
<td>n</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Chioggia*</td>
<td>n</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Venice</td>
<td>n</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Trieste</td>
<td>n</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Kvarner</td>
<td>n</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
<tr>
<td>Total</td>
<td>n</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
</tr>
</tbody>
</table>

*No foetal data available for Chioggia.

J. CETACEAN RES. MANAGE. 21: 25–31, 2020
Despite this request for rifles being refused, the syndicate continued a dolphin hunting programme and indeed supplied the Natural History Museum of Genoa with 29 common dolphin and 16 bottlenose dolphin specimens between 1914 and 1917 (Cagnolaro et al., 2012; Poggi, 1986; 2014).

During the era of the National Fascist Party in Italy (1922–1943), animosity towards dolphins increased, encouraged by a series of propaganda articles in which ‘the dolphin’ was identified as an enemy of the national fishing heritage (Cirillo, 1942). Following a decree by the Ministry of the National Economy (26 December 1928) formally published in the Gazzetta Ufficiale (n. 22, 26 January 1929), for the period 1928–38 a 50 Lira bounty increased to 100 Lira if a pregnant female (~45–90 EUR in today’s money) was to be provided to any Italian citizen who killed a dolphin, if confirmed by the local maritime authorities. During the Second World War, the Ministry of Finance allocated 40,000 Italian Liras (~26,000 EUR in today’s money) for culling campaigns; which ceased at the end of 1942 (Cirillo, 1942). Although the provision of bounties ceased, some dolphins continued to be hunted legally until 1980 and Italy’s adherence to CITES (Bearzi et al., 2004) as noted above.

### Landings

Annual data for the officially reported total numbers of landed dolphins and the amount paid in bounties (by Compartimenti) from 1927 to 1937, are reported in Table 1 and summarised over the whole period in Table 2. Over the full period, a total of 7,629 dolphins were reported killed, increasing from 306 in 1927 to 859 in 1937 (the peak year was actually 1934 with a catch of 865). The average (by Compartimenti) increased from 23.8 (SD 18.6) in 1927 to 66.1 (SD 51.0) in 1937 (Fig. 2). Over the same period, the total bounty paid increased from 18,100 in 1927 to 49,650 Italian Liras in 1937 (although during this time the value of the Lira had decreased by around 27%).

There was considerable variation in reported catches amongst Compartimenti (see Fig. 3), with the highest reported total catches from Ancona in the Adriatic Sea (1,275 with 55 foetuses) and Palermo in the Tyrrhenian Sea (1,137 with 78 foetuses) with annual average catches of 115.9 (SD 36.4) and 103.4 (SD 43.8), respectively. Reported catches increased in both of these areas over the period, with the highest values of 204 for Ancona in 1937 and 199 for Palermo in 1936.

As noted above, additional data (although only based upon weights) were found for Chioggia for the period 1946 to 1960. In this period, the estimated captures, although with a certain degree of uncertainty related to the assumption about the average weight of the specimens, showed a collapse, reaching 2.7 ± 0.5 dolphins per year. This was due to the suspension of rewards and probably the non-mandatory catch reporting.

After the Second World War, the Kvarner Gulf Compartimento in the northeastern Adriatic remained active. Crnkovic (1958) asserted that the coastal populations of bottlenose and short-beaked common dolphins comprised thousands of individuals and about 600 dolphins (species unknown) were reported killed although no bounties were paid after 1960 (Marelic, 1961). D’Ancona (1926) had reported high catches (around 222 with considerable annual variation) for the decade 1914–1925.

In Italy, no data on dolphin landings are available in the Reports of the Central Statistical Institute after 1980, the year when the absolute ban on dolphin hunting was issued, but a few illegal catches continued for a short time, e.g. Bearzi et al. (2004).

### DISCUSSION AND CONCLUSIONS

In the period 1927–37, along the Italian coast, over 7,200 dolphins were reported killed. In addition to this value, we have to consider the undocumented number of wounded animals that sank and died later. In the same period, 400,000 Italian Liras were distributed to fishers as rewards, equivalent now to 355,000 EUR, about 40–50 EUR for each dolphin. Considering that the meat could be consumed both at the family level or sold on the market, mainly as ‘musciamme’¹, this kind of hunting could be profitable (Stanzani and Piemarocchi, 1992).

¹Until the early 1980s, fishing communities and families prepared dolphin meat as ‘musciamme’, from the Arabic word mušammà which means dry and hard. The meat was salted in a 20–25% solution for 15 days, left to dry naturally and then sold in the fish markets as a product of high gastronomic and economic value (Pellegrino and Tortonese, 1982; Cagnolaro et al., 1983).

<table>
<thead>
<tr>
<th>Comp.</th>
<th>Catch</th>
<th>% of total</th>
<th>Annual average</th>
<th>SD</th>
<th>Foetuses</th>
<th>% foetuses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Genoa</td>
<td>347</td>
<td>4.5</td>
<td>31.55</td>
<td>9.6</td>
<td>9</td>
<td>2.6</td>
</tr>
<tr>
<td>Leghorn</td>
<td>386</td>
<td>5.1</td>
<td>35.09</td>
<td>9.6</td>
<td>21</td>
<td>5.4</td>
</tr>
<tr>
<td>Anzio</td>
<td>387</td>
<td>5.1</td>
<td>35.18</td>
<td>26.56</td>
<td>21</td>
<td>5.4</td>
</tr>
<tr>
<td>Naples</td>
<td>316</td>
<td>4.1</td>
<td>28.73</td>
<td>18.5</td>
<td>24</td>
<td>7.6</td>
</tr>
<tr>
<td>Reggio</td>
<td>201</td>
<td>2.6</td>
<td>18.27</td>
<td>5.00</td>
<td>27</td>
<td>13.4</td>
</tr>
<tr>
<td>Catania</td>
<td>581</td>
<td>7.6</td>
<td>52.82</td>
<td>19.1</td>
<td>41</td>
<td>7.1</td>
</tr>
<tr>
<td>Palermo</td>
<td>1,137</td>
<td>14.9</td>
<td>103.36</td>
<td>43.8</td>
<td>78</td>
<td>6.9</td>
</tr>
<tr>
<td>Cagliari</td>
<td>473</td>
<td>6.2</td>
<td>43.00</td>
<td>14.6</td>
<td>32</td>
<td>6.8</td>
</tr>
<tr>
<td>Bari</td>
<td>326</td>
<td>4.3</td>
<td>29.64</td>
<td>15.2</td>
<td>15</td>
<td>4.6</td>
</tr>
<tr>
<td>Ancona</td>
<td>1,275</td>
<td>16.7</td>
<td>115.91</td>
<td>36.4</td>
<td>55</td>
<td>4.3</td>
</tr>
<tr>
<td>Chioggia</td>
<td>778</td>
<td>10.2</td>
<td>70.73</td>
<td>25.4</td>
<td>0</td>
<td>n/a</td>
</tr>
<tr>
<td>Venice</td>
<td>390</td>
<td>5.1</td>
<td>35.45</td>
<td>12.7</td>
<td>33</td>
<td>8.5</td>
</tr>
<tr>
<td>Trieste</td>
<td>188</td>
<td>2.5</td>
<td>17.09</td>
<td>9.3</td>
<td>22</td>
<td>11.7</td>
</tr>
<tr>
<td>Kvarner</td>
<td>844</td>
<td>11.1</td>
<td>76.73</td>
<td>42.7</td>
<td>28</td>
<td>3.3</td>
</tr>
<tr>
<td>Total</td>
<td>7,629</td>
<td>100.0</td>
<td>693.55</td>
<td>197.2</td>
<td>9</td>
<td>5.9*</td>
</tr>
</tbody>
</table>

*The percentage of foetuses for the total is based upon a total catch of 6,851, i.e. excluding the 778 catch for Chioggia for which there are no foetal data available.
The data presented here are valuable but it must be recognised that there are a number of uncertainties surrounding the official data from 1927–33 that it is not possible to fully answer (but that would need to be taken into account in any attempt to use them in a population assessment), including:

1. the reliability of the reported data, even in terms of total numbers landed is not clear – e.g. given the financial considerations scenarios could be envisaged in which the numbers were inflated (collaboration amongst fishers and officials to obtain maximum financial gain);
2. the locations of the catches (as opposed to the landings) are unknown;
3. the numbers do not include animals that were injured and later died but were not able to be brought to shore and thus reported – the number of such animals is unknown but may be quite high;
4. the reported data are not broken down by species or sex;
5. the foetal data will almost certainly be an underestimate given the difficulties of identifying small foetuses; and
6. as the data are not broken down by sex then the proper comparison (pregnant females to total adult females) cannot be made – the comparison in this paper simply shows the percentage of total reported animals (which will include males and immatures) that had a reported foetus.

With respect to species identity, present knowledge of the behaviour and distribution of dolphins in the ‘study’ area,
suggests that the most frequently caught species was the bottlenose dolphin, probably followed by the common dolphin; striped dolphins are usually found further from the coast and so are probably the least represented. The bottlenose dolphin is the most common cetacean of the Italian continental shelf (Bearzi and Ferretti, 2000; Gnone et al., 2011; Ninni, 1901; Notarbartolo di Sciara et al., 1993) and is the species which commonly displays opportunistic behaviour, taking fish from nets and fish farms (Di Natale and Notarbartolo di Sciara, 1994; Diaz Lopez, 2007a; 2007b; Lauriano et al., 2004; Quero et al., 2000).

Fortuna et al. (2018) produced density maps of bottlenose dolphins in the Adriatic Sea from systematic surveys showing summer concentrations in the North (that would coincide roughly with Chioggia, Venice, Trieste and Kvarner), in the centre (that would be roughly at the same latitude as Ancona) and the South (that would include Bari). Estimates of abundance based upon combined data from aerial surveys in 2010 and 2013 were 2,600 (CI 2,200–2,900) in the North, 1,100 (CI 800–1,500) in the central area and 1,800 (CI 1,300–1,800) in the South. For comparative purposes, for the 1927–37 period, total reported catches were 2,200 (annual average 200 or around 13% of the present abundance) for the northern area, 1,275 (average 116 or around 11%) for the central area and 326 (average 30 or around 2%) for the southern area. Given the uncertainties referred to above it is not possible to draw any conclusions on likely impact of catches at that time. However, if all or most of the hunted animals were bottlenose dolphins and present-day abundance reflects past abundance, then this would probably have had an adverse effect at the sub-population level for the northern and central regions given the fertility rate for adult females in the eastern Ligurian Sea of around 0.3–0.4 estimated by Rossi et al. (2017) with a calf mortality rate of around 0.25.

It is believed that common dolphins, which are now almost absent from the Adriatic, were once relatively abundant there (e.g. see Bearzi et al., 2004). It is not impossible that this is related at least in part to bounty hunting.

Similar contemporary data to those for bottlenose dolphins in the Adriatic do not yet exist for the Ionian and Tyrrenhian Seas for either of the most likely hunted species, the bottlenose and common dolphins. However, Gnone et al. (2011), estimated the Ligurian ‘eastern sub-population’ of the bottlenose dolphin at about 510–552 individuals in 2006 and Lauriano et al. (2010) estimated about 884–1,023 individuals for the total Pelagian Sanctuary. The relevant Compartimenti are Genoa and Leghorn where the total catches for the 1927–37 period were 733 (annual average around 66 that could represent between 6–13% of the present total abundance). Following the logic applied to the Adriatic Sea, if all or most of the hunted animals were bottlenose dolphins and present-day abundance reflects past abundance then this would probably have had an adverse effect at the population level given by Rossi et al. (2017).

Panigada et al. (2011; 2017) developed density maps and abundance estimates for striped dolphins based upon aerial surveys undertaken seasonally (except autumn) from 2009–14 (although not all areas in all seasons). The estimated abundance (over 95,000: 92,900–120,300 95% CI) was thus high compared to the hunting levels in the 1927–37 period, even if they were all striped dolphins.

In summary, hunting dolphins for food, pleasure or to eliminate a competitor for fishing was a relatively common and legal practice even until 1980 in Italy. Hunting was encouraged by the authorities and fuelled by substantial bounties prior to the Second World War as these cetaceans were considered enemies of the national fishing heritage (Cirillo, 1942; Maggioli, 1941). As is the case elsewhere in the world, opinions on dolphins have changed since the 1970s and today dolphins are fully protected and generally popular (although perhaps still less so in some fishing communities). They are considered key species in raising public awareness about the importance of environmental conservation and are seen as important bioindicators of the health of marine and coastal ecosystems (Notarbartolo di Sciara, 2002).

ACKNOWLEDGEMENTS

This study was carried out thanks to the support of the directors and staff of the Libraries of the University of Genova, Biblioteca Nazionale of Florence, Laboratorio di Biologia Marina e Pesca of Fano and Università Agraria of Bari. Their help was greatly appreciated. A special thanks to Corrado Piccinetti (Laboratorio di Biologia Marina e Pesca of Fano) for his useful suggestions.

REFERENCES

Bearzi, G. 1895. Modificazioni delle abitudini del delfino comune (Delphinus delphis) osservate in Liguria e prodotte dal generalizzarsi della pesca intensiva. Neptania 10: 156–64. [In Italian].


Brusina, S. 1889. Mammals of the Adriatic Sea. Rad Jazu 95: 79–177. [In Croatian].


Cattaneo-Vietti, R. and Bava, S. 2009. La tonnarella e la pesca tradizionale a Camogli. Le Mani, Recco. 143pp. [In Italian].


Cirillo, S. 1942. La caccia ai delfini. Notizie Naturalistico-Fra schiologiche. 1: 53–64. [In Italian].


Cirillo, S. 2004. La caccia ai delfini. La Pesca italiana 3(4). [In Italian].


Cuculic, N. 1960. Five-year research programme to advance marine fisheries. Morsko Ribarstvo 12: 84–86. [In Croatian].

Del Rosso, F. 1905. Pesche e peschiere antiche e moderne nell’Etruria Marittima. Piaggi, Florence. [In Italian].


Levi-Morenos, D. 1905. Mezzi per la difesa dei Delfini. Atti della Commissione Consultiva per la Pesca. Sessione dicembre 1899. [In Italian].

López, A. 1948. Storie di mare: il delfino. [In Italian].

López, A. 1948. Storie di mare: il delfino. [In Italian].

Maggioli, U. 1941. Il delfino é un nemico del patrimonio ittico nazionale. [In Italian].


Ministry of Agriculture, Industry and Commerce. 1905. Atti della Commissione Consultiva per la Pesca. Sessione dicembre 1904. [In Italian].

Ministry of the National Economy. 1927–37. Premi per la cattura dei delfini. Nuovi Annali dell’Agricoltura. Rome. [In Italian].

Ninni, E. 1901. Sulle catture di alcuni Cetacei nel Mare Adriatico ed in particolare sui Delphinius tyrbus (Fabr.). Neptunia 8: 67–78. [In Italian].


Pellegrino, C. and Tortone, E. 1982. Pesci marini e prodotti alimentari derivati. Edagricole. 152pp. [In Italian].


Stenella coerulealba

Tursiops truncatus

Tursiops truncatus


Tramandaí, Southern Brazil.