

REVIEW ARTICLE

Historical records of cetacean fishery in the Turkish seas

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Abstract

In this study, the publications on cetacean (bottlenose dolphin, common dolphin and harbour porpoise) fisheries in the Turkish Seas are reviewed. The cetacean fishery began in ancient time in Anatolia and continued for over 2300 years, until 1983 when the fishery was banned in Turkey. In the 20th century it was increased, especially in the 1950's and 1970's, on the eastern Turkish Black Sea coast because of the Meat and Fish Institution (EBK) Fish Meal and Oil Factory established in Trabzon in 1952 and modernized in 1962. The produced oil was used domestically as well as exported. Presently, all cetaceans are under the legal protection in the Turkish waters.

Keywords: Cetacean fishery, dolphin fishery, hunting.

Introduction

The Black Sea has a long history of cetacean fishery. This fishery, the main cause for the decline in the cetacean populations (harbour porpoises, *Phocoena phocoena*, common dolphins, *Delphinus delphis*, bottlenose dolphins, *Tursiops truncatus*) in the Black Sea. In this case herds of dolphins passing through the Istanbul Strait as a remarkable decrease in the 1950's began to be noticed by Tezel (1958) the first. Öztürk (1996) summarized the published record of the dolphin catch, Yel *et al.* (1996) and Öztürk *et al.* (2004) reported some aspects of the Turkish cetacean fishery. In this review paper, we aim to understand the history of the cetacean fishery on the Black Sea coast of Turkey in the past with the available published data.

History

Historian Xenophon wrote in his book “Anabasis” in BC 400, Mossynoics who were living in the wooden castles on the eastern coast of Anatolian Black Sea, kept the dolphin meat and oil salted down in the large earthenware jars. They used this oil like olive oil. Strabon (BC 63/64-AD 24) wrote Chaldia (Chalybes) tribes living in eastern Sinop caught dolphins and used their oil for various works. (Başgelen 2012). In the ancient time, Byzantion’s (Istanbul) fishermen caught dolphins from small boats with tridents mostly for oil (Tekin 2010). During the archaeological excavations in Yenikapı (Istanbul), some bones of bottlenose and common dolphins dating back to 4th and 13th century AD according to the radiocarbon tests were found and butchery marks on the bones were identified (Onar *et al.* 2008a,b).

A naturalist Pierre Belon in 1553 explained the fish trapping in the Marmara Sea and he indicated that the dolphins were also caught (And 2011). An Ottoman Turkish traveler Evliya Çelebi mentioned in his itinerary in the 17th century, in the lighthouse of Rumeli Feneri at the Black Sea entrance of the Istanbul Strait, built sometime between 1563 and 1648 (Sönmez 2010), dolphin oil (*ca.* 10 kg per night (Sönmez 2010) was used (Kahraman and Dağlı 2003). Tournefort (1717) travelled on the eastern Anatolian Black Sea coast in 1701 and mentioned in his travel book that the people of Sinop exported oil made from dolphins and seals. Bijiskyan (1817-1819) also reported that dolphin oil was one of the exporting items in Sürmene and used as lamp oil along of the eastern Black Sea coast of Anatolia (Lazistan). Şakir Şevket wrote in 1877 that fishermen of Sürmene had caught many dolphins and had produced oil (Hacıfettahoğlu 2001). Şakir Şevket wrote in 1877 that fishermen of Sürmene caught many dolphins and produced oil (Hacıfettahoğlu 2001). According to the annual record of Trabzon Province, dolphins were caught, oil was processed and exported to Europe in 1888 from Trabzon and Rize (Emiroğlu 2002).

Devedjian (1926) mentioned about the cetacean fishery in the Black Sea, especially around Trabzon, but also in the Istanbul Strait and Marmara Sea during the Ottoman Period. Common dolphin and harbour porpoise herds were surrounded by strong nets and then killed by rifles or harpoons. The names of the city or town and annual amount of oil production of major cetacean fishery were Düzce (Akçakoca), Zonguldak (Filyos), Trabzon (Centrum-200t, Akçaabat- 10t, Araklı, Sürmene-140t), Rize (Eriklimanı, Çayeli, Fındıklı, Arhoy), Giresun (Kozagzı- 40t, Espiye), Ordu (Fatsa), Sinop (Gerze), Kastamonu (İnebolu, Doğan yurt), Samsun (Centurm and Terme - 11t) on the Turkish Black Sea coast.

After the First World War and the Turkish War of Independence (1919-1923), Turkey adopted a resolution (no: 2956) on exemption of the hunting tax on dolphins and dolphin oil in 1936 (Arpa 2012). In 1948, Turkey continued to support cetacean fishery by giving bullet and rifles. The delegation of leaders of dolphin hunters visited to Prime Minister and President of Republic and gave

their request (Zengin 2011) (Figure 1). Turkey continued the cetacean fishery until 1983. Presently, all cetaceans are under the legal protection in the Turkish waters.



Figure 1. The Delegation of leaders of dolphin hunting (Karabacak Reis from Sürmene, Muzaffer Nuhoglu from Akçaabat Mersin village and Mustafa Reis from Zavena (Salacık) (Malkoç), Prime Minister Hasan Saka and President of Turkey İsmet İnönü (Zengin 2011)

Cetacean Fishery and Catch Data in the 20th Century

Before petroleum-based industries were developed, dolphin oil was essential for the people of the Black Sea. They used it for pharmacy, lamp oil, currier's oil, engine oil, lubricating oil, drugs containing vitamin D, albumin, paints, varnishes, soap, cosmetics, tinned meat and sausage, leather shoe wares, fish meal as a feed to poultry, bone fertilizer and glue in all Black Sea countries (Acara 1965; Birkun 2008). The following towns are known as dolphin fishing towns; Sürmene in Trabzon, Çayeli and Pazar in Rize, Gülburnu in Giresun, Perşembe and Kışlaönü in Ordu, Karadeniz Ereğlisi, Sarıyer, Rumeli and Anadolu Feneri in Istanbul (Öksüz *et al.* 2005). This occupation was passed down from a father to a son (Zengin 2008).

The Black Sea cetacean fishery is known to have begun in 1870 in the USSR and Turkey followed the course in the 1930's. The first oil mill was established in Sukhumi in 1882, the second one in Pitsunda in 1883 (Slastenenko 1955). The first plants of oil extraction were founded in Trabzon at the beginning of the 1800s. Meat and Fish Institution (EBK) Meal and Oil Factory was established in Trabzon in 1952 and was modernized in 1962, enough to process 100t per day (Yel *et al.* 1996). Besides, there were small plants in Akçabat and fishermen's primitive plants in the villages for oil processing (Nümann 1952) (Figure 2). There was only one plant which was built with the support of Germany before 1952 in Trabzon. But the first primitive plants were built in Zavena Village by Rum fishermen in Trabzon at the beginning of the 1800's. They taught this fishery to Muslim fishermen (Zengin 2008). In a primitive facilities, such as in

Yakakent, after the 1970's, they stripped the skin of 150-200 dolphins in a day. They simply boiled blubber in pots to obtain oil. The processing of blubber of 30-40 individuals took a whole day. On the following day, they filtered the oil with cloth and obtained 2-3 barrels of oil from the boiler. The remaining portion was called 'kıkırdak (cartilage)'. They used it as fuel for thermo process and for a second process for oil. This 'black' oil was added to the first processed oil. In a season they sold 150-200 barrels (30-40 t) of oil.



Figure 2. A) An old little hut still existing in one of the dolphin fishermen's garden. This old hut had been used for homemade production of dolphin oil until 1983. B) A farmer showed us how they produce oil from dolphin blubber with this old and handmade equipment before 1983. C) Entrance of EBK Factory in Trabzon. This plant has been unused since 1983. D) The port of entry to the plant from the sea. E) Bycaught harbour porpoises for processing in Yakakent in 1993. (Photos: TUDAV/B. Öztürk)

After the cetacean fishery banned in 1983 they used bycaught cetaceans in bottom nets until the 1990's. They used harbour porpoises more than common dolphins and bottlenose dolphins (max 5%), because the porpoises provided oil of better quality and quantity. There were two more primitive plants producing

small amount of oil in Yakakent. They sold to Gaziantep (south eastern of Turkey) for leather production and to Samsun Vezirköprü (Arpa 2012). In 1990, there were 23 fish oil and meal plants in all Turkish Black Sea coast with the support of fisheries cooperatives such as in Yakakent as well as private sectors (Zengin 2008). Civra's fishermen used stranded cetaceans as well in primitive plants (Öksüz *et al.* 2005).

This mass dolphin fishing peaked in the 1930s, and later in the 1950s in other Black Sea countries. It was increased, especially in the 50's and 70's, in Turkey because of the Meat and Fish Institution (EBK) Fish Meal and Oil Factory was established in Trabzon in 1952 and was modernized in 1962 (Figure 3).

According to TUIK (Turkish Statistical Institute) data between 1967 and 1983, total 44,178 t of dolphins were caught (Öztürk *et al.* 2004; Arpa 2012). In 1969, a total of 84.9t of dolphins (22.5t in Izmir Province, 2.7t in Muğla Province) were caught in the Turkish Aegean Sea (Bilge 1972). In 1970, total catch of dolphin caught are 1.5t in the Marmara Sea, 0.5t in the Aegean Sea (Berkes 1977). Yel *et al.* (1996) assumed that 50 kg is as the mean weight of a processed dolphin, it may crudely be inferred that total 200,700 dolphins were caught and processed in EBK Plant during 1954-1983. Total 135,000-140,000 individuals were caught in the Soviet water in the Black Sea in 1938 (Björge *et al.* 1994). In 1964 and 1965, Turkey exported to Greece 38t and 58t of dolphin oil, respectively (Fish and Fisheries 1965, 1966).

A general decreasing trend towards the ban of the fishery in 1983 is seen in Figure 4. From 1954 to 1966, a total of 1,456 t of oil and 866t of fish meal were produced from 5,503 t of dolphins. Dolphin hunting was prohibited for 18 months between September 1980 and March 1982 for some political reasons. During the period between 1967 and 1983, 4,534 t of dolphins were processed so as to obtain 1,277 t of oil and 779 t of meal (Yel *et al.* 1996). According Öztürk *et al.* (2004) the Eastern Black Sea (89%) had much more catch than the Western Black Sea (11%), where the cetacean fishery almost ceased after 1973. The total catch for 1970-1983 was 28,913 t, the maximum catch was recorded in 1971 as 4,444 t (Öztürk *et al.* 2004). According the report of the sub-committee on small cetaceans, International Whaling Commission, in 1983, harbour porpoises were believed to account for 80%, common dolphins 15-16%, bottlenose dolphins 2-3% of the total catch of dolphin fisheries in Turkey from 1976 to 1981 (Björge *et al.* 1994).

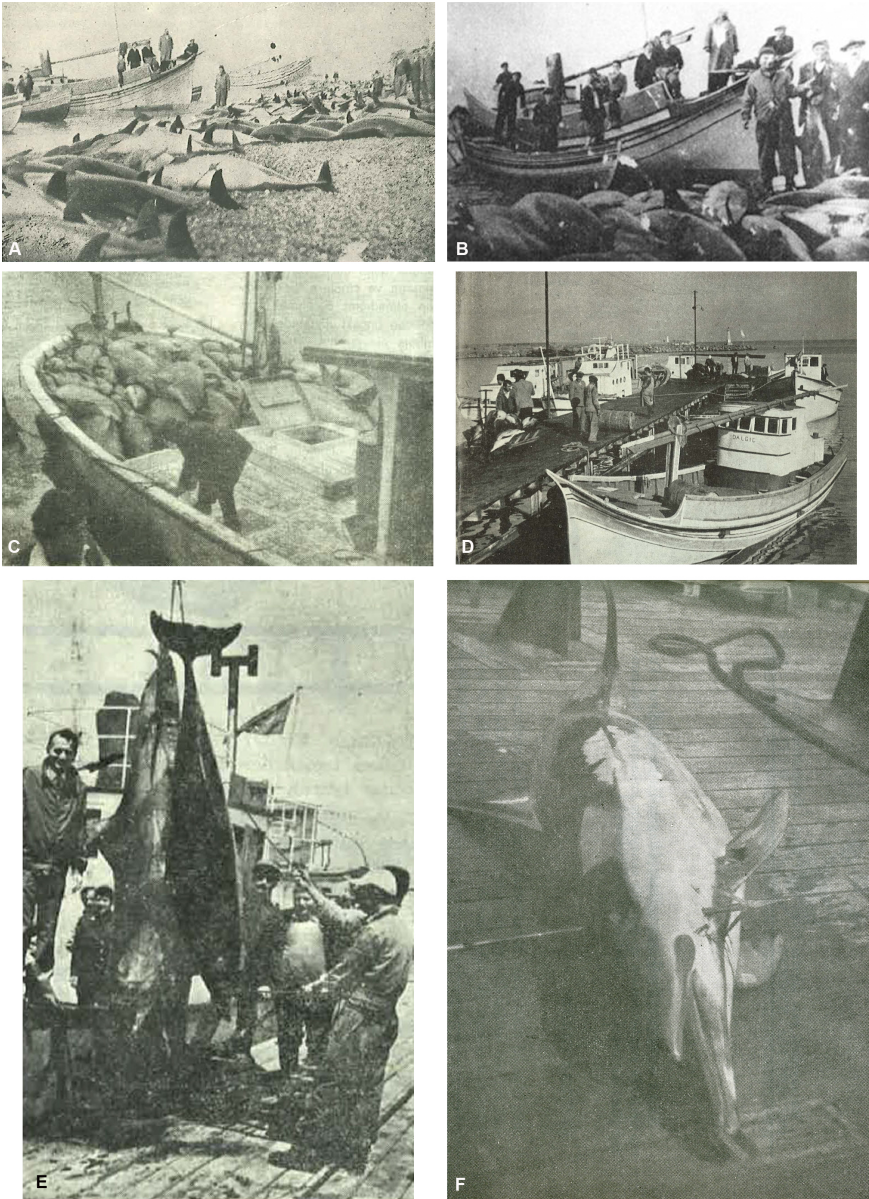


Figure 3. A) On 1 April 1953, approximately 800 individuals (ca. 50kg each) were caught by surrounding nets (alamana) which were 60 fathom high, 800 fathom long, in Sürmene in 5 hours (Onat 1954). B) Dolphin fishermen from the Turkish Black Sea in 40's (Zengin, 2008), C) A boat was full of dolphins (Fish and Fisheries 1975), D) Landing dolphins and dolphin fishing boats which were berthed to the port of EBK Factory in Trabzon (Fish and Fisheries 1964). E) Landing operation (Fish and Fisheries 1970), F) A harpooned common dolphin (Fish and Fisheries 1961)

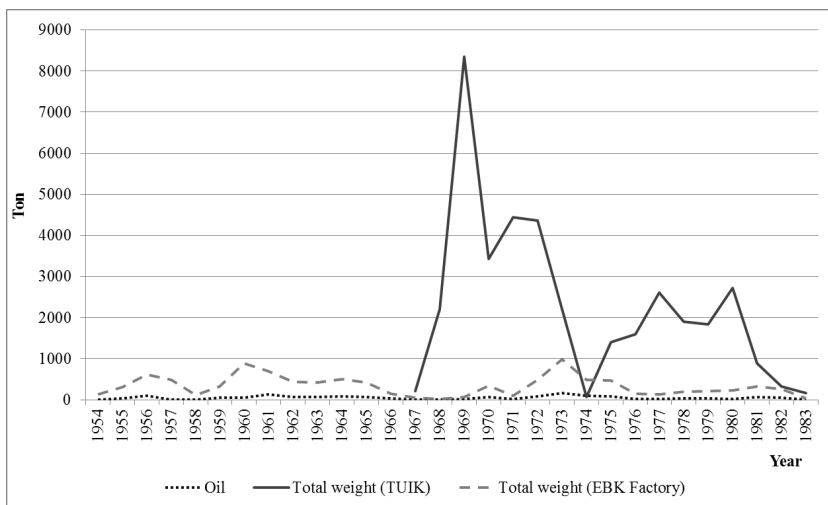


Figure 4. Oil weight and total weight of dolphins, caught on the Turkish coast of the Black Sea; Total weight data from EBK Factory (Yel *et al.* 1996). Total weight data from TUIK between 1967 and 1983 (based on Öztürk *et al.* 2004; Arpa 2012)

The oil productivity was 17.4-37.0% (mean 27.9%) of the total dolphins processed and the meal productivity was 11.3-18.4% (mean 17.0%) (Öztürk *et al.* 2004).

The cetacean fishery was banned in the USSR, Bulgaria and Romania in 1966 and in Turkey in 1983 (Birkun 2008). In spite of the ban, however, since 1983 until 1991 occasional cases of illegal killings were reported (Bjørge *et al.* 1994).

Catch Methods

The main catching gear used by all the Black Sea countries was the surrounding net until the 1950's (Yel *et al.* 1996). According Slastenenko (1955), this method was the most earliest and most efficient. It has transferred to Russian from Turks which had used for hundreds of years on Caucasian coast (eastern Black Sea). There was a record that 1500 common dolphins were caught at a time (Slastenenko 1955). Turkish fishermen used surrounding nets (alamana), which were 800-1500m in length, 100m in height and 8-12 cm mesh size. (Yel *et al.* 1996). They used also driftnets which were 80-100 fathom in length and 6-7 fathom in height especially in spring. The nets did not have weight on the lower line. They used two buoys on both ends of the nets and one anchor for one end. The maximum catch for this type of nets was 10-15 individuals in Yakakent, Samsun (Arpa 2012).

Hunting with rifles was introduced on a large scale for cetacean fishery in the 1940's. Before then they had been using very old rifles. The first modern rifles for dolphin hunting were provided by the government in the 1940's (Yel *et al.*

1996). Turkish fishermen used especially rifles later in the 1960's. Effect of this hunting can be seen in the catch data of TUIK (Figure 4). In 1957, RV/Arar, which is a research vessel of EBK, made some tests on the use of 'harpoon-guns' in cetacean fishery in Marmara Sea (Fish and Fisheries 1958).

The fishermen found cetacean in open seas (max. 100-150 nautical miles) where the anchovy were (Zengin 2008; Arpa 2012). Fishermen of Sürmene went 60 nautical miles offshore, even to Sakarya (Öksüz *et al.* 2005). They sailed with a group of boats (10-12m length) with 5 crew and travelled 5-7 days at the sea. One team consisted 15 boats with 35-40 crew (Zengin 2008). They processed the oil on the coast close to where they fishing. The nets were weaved fibres of hemp (Öksüz *et al.* 2005; Zengin 2008).

Bulgarian fishermen also used rifles, but it was banned in Russia where they used only nets (Nümann 1952). The shooting distance should be 100-150m. They tried to shoot at the ventral side of dolphins. In this way it could not escape with minor injuries. They shot 30-40 individuals in a day, but they caught 400-500 individuals with surrounding nets. In 1950 they caught 1150 individuals at a time in Fatsa-Yalıköy. Civra's (Balıklı) fishermen went to USSR and Greece for teaching fishing techniques (Öksüz 2005).

They were caught mainly in the eastern Black Sea from the end of October till March and April (Zengin 2008; Arpa 2012). The fishing rules were arranged each year by the Turkish Government in compliance with the Fisheries Act and Notice (FAN) (Yel *et al.* 1996). According to the official records, the number of cetacean fishermen and rifles about were 600 and 500, respectively, and 80% were used in Rize and Trabzon areas (Yel *et al.* 1996). Rifles and bullets were provided by Fisheries Department of Ministry of Agriculture through fisheries cooperatives. Although it was stated in FAN that bullets and rifles were given to fishermen free, they had to pay for bullets. Rifles and bullets were handed out to fisheries cooperatives two weeks before the dolphin hunting season started and taken back one month after the season. A registered fisherman could only take one rifle and 1500 bullets at maximum in a season, but the bullets were supplied to each fisherman in batches of hundred bullets. When a fisherman used the first hundred, he had to give back empty hives in order to obtain another hundred bullets. Fishermen had to report to the Ministry about the numbers of bullets used and dolphins hunted through cooperatives.

A report about overfishing of dolphins was prepared by Istanbul University Hydrobiology Research Institute but it was not published (Berkes 1977). After the ban of cetacean fishery in 1966 proclaimed by other Black Sea countries, Turkey also made some arrangements to protect cetacean stocks, such as prolonging the duration of fishing-closed seasons (Table 1), imposing licensing requirements on dolphin hunting and reducing the number of rifles and bullets (Yel *et al.* 1996).

Table 1. Regulations of cetacean fishery in Turkey* (According to Arpa 2012)

No	Closed season	Date of the Regulation
1956	1 June-1 September	13.04.1956
1972/28	1 June-1 October	07.04.1972
1973/31	1 June-30 September	02.04.1973
1974-1975/2	10 June-30 September	31.03.1974
1978-1979/6	Not	12.02.1978
1979-1980/8	25 May-31 October	22.02.1978
1980-1981/10	1 June-31 October	28.02.1980
1982-1983/14	20 May-31 October	28.02.1982
1984-1985/17	All year	29.12.1984**

* Years of continued regulation are not listed, **Bern Convention was signed on 20.02.1984.

The percentage of lethal shootings was about 10-15% including dolphins which sank and were not retreated. The hunting was carried out in the winter season so that the percentage of sunken dolphins was quite low since they have a thicker blubber layer during winter than in summer (Yel *et al.* 1996). When a dolphin was shot but did not die, they caught it by hook, hold it by the fluke and waited until it was drowned (Arpa 2011). According to Slastenenko (1955), by hunting with rifles, young and inexperienced dolphins, which had high content of fat, were affected more severely than others. Especially during the hunting in summer season, when the fat content reduced to half, dolphins could not be brought to the boats (Berkes 1977). Many of targeted dolphins were not captured, because they escaped far away (Nümann 1952). In the 20th century, it is estimated totally 4-5 million cetacean were killed in the whole Black Sea (Birkun 2006).

Discussion

Even after the fisheries were banned, the Black Sea cetaceans have been suffering from pollution, bycatch, epidemics, competition against fishermen, *etc.* To evaluate the current status of the Black Sea dolphins for better conservation, the information on the past status is necessary.

In the 20th century, the abundance of Black Sea cetaceans was considerably reduced by massive direct killing until 1983. It could be suspected also that the populations did not recover adequately during the subsequent period (1983-2006) and their population size was even diminished or showed very little recovery owing to the escalation of ongoing major threats, such as bycatch, habitat degradation, mass mortality events *etc.* (Birkun 2008).

Due to the insufficient data of historical records, such as species and sex, however, we are still unable to reconstruct the past population of the dolphins in the Black Sea, which is necessary information for evaluating their present status. Unfortunately, we have quantity data for only the last thirty years of cetacean fishery, although it continued for more than 2300 years in the Turkish seas. Besides, other anthropogenic problems appeared more recently, such as bycatch

especially in turbot fishery and overfishing. Therefore conservation effort should be even more intensified in these days.

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Türkiye Denizleri'nde cetacea balıkçılığının tarihsel kayıtları

Özet

Bu çalışmada Türkiye'de geçmişte yapılan cetacea (afalina, tırtak ve mutur) balıkçılığı hakkındaki yayınlar derlenmiştir. Antik çağda Anadolu'da başlayan yunus avcılığı, 1983 yılında yasaklanana kadar 2300 yıldan fazla bir süre yapılmıştır, 20. Yüzyılda özellikle 1950'ler ve 1970'lerde, 1952'de Trabzon'da Et ve Balık Kurumunun Balık Unu ve Yağı Fabrikası kurulması ve 1962'de modernize edilmesi ile avcılık artmıştır. Üretilen yağ ülke içinde kullanıyor ayrıca ihraç ediliyordu. Şuan Türkiye denizlerinde yaşayan tüm cetacea türleri koruma altındadır.

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