

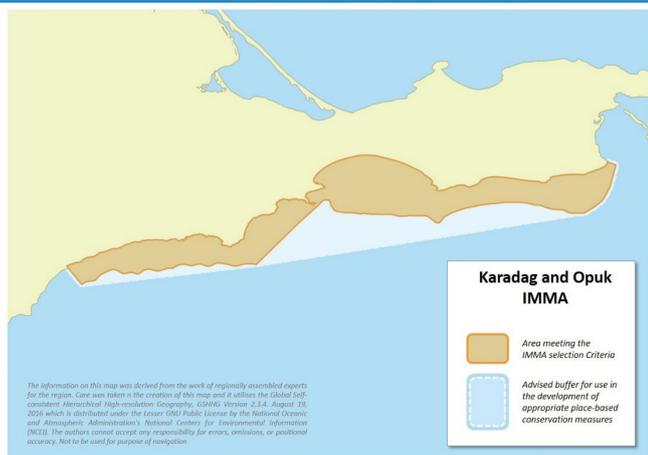
Karadag and Opuk IMMA

Description

The Karadag (Karadağ) and Opuk IMMA is located in open coastal waters between the Sotera Cape and the Takyl Cape in the northern part of the Black Sea. Both the Karadag Nature Reserve and the Opuk Nature Reserve are located within the IMMA. Proximity to the Kerch Strait causes lower salinity and colder winter temperature in the inshore waters (4-7 °C or, at minimum, 1 °C). The sea floor of the IMMA hosts a number of fish species that are staples in the diet of all three Black Sea cetaceans. The coastline along the Kerch Peninsula and the seafloor in this part of the IMMA is slightly sloping and the predominantly sandy. This topography creates favourable conditions for specific foraging strategies (i.e. beaching) demonstrated by the Black Sea bottlenose dolphins during mullet migrations through the area (Gladilina, 2018). Sprat trawling is common in the area during the warm season and foraging bottlenose and common dolphins are regularly observed interacting with the trawlers (Gladilina, 2012b). Also, this area is an important migration corridor for herrings and anchovies, which are important prey species for harbour porpoises (Tsalkin, 1940). Numerous porpoise bycatch and stranding cases are recorded from this area (Vishnyakova et al., 2013; Vishnyakova, 2017).

Criterion A: Species or Population Vulnerability

The Karadag and Opuk IMMA is an important habitat for the endangered Black Sea bottlenose dolphin (*Tursiops truncatus ponticus*) (Fig. 2). Two other Black Sea cetaceans, the Endangered harbour porpoise (*Phocoena phocoena relicta*) and the vulnerable common dolphin (*Delphinus delphis ponticus*) also extensively use this area (Birkun, 2002; Mikhalev, 2005a; 2005b; Birkun and Krivokhizhin, 2011; Birkun et al., 2014; Krivokhizhin et al., 2012; Gol'din et al., in press; Öztürk et al., in press).



Area Size

2,079 km²

Qualifying Species and Criteria

Black Sea bottlenose dolphin –

Tursiops truncatus ponticus

Criteria A, B2, C1, C2, D1

Marine Mammal Diversity

Tursiops truncatus ponticus, *Phocoena phocoena relicta*, *Delphinus delphis ponticus*

Summary

The Karadag and Opuk IMMA is located in the coastal waters of the southeastern and eastern Crimea, between the Sotera and the Takyl Capes. The IMMA contains habitat from the coast to the 200 m depth contour in the southwest, and follows the 40m depth contour in the northeast. All three Black Sea cetacean species inhabit the area: the bottlenose dolphin (*Tursiops truncatus ponticus*), the common dolphin (*Delphinus delphis ponticus*) and the harbour porpoise (*Phocoena phocoena relicta*). The IMMA is particularly important for bottlenose dolphins, where they occur in at least two large aggregations and at the highest density in the Black Sea. The IMMA is an important bottlenose dolphin nursing and feeding area. Bottlenose dolphins in these local populations show distinct morphological and behavioural features.

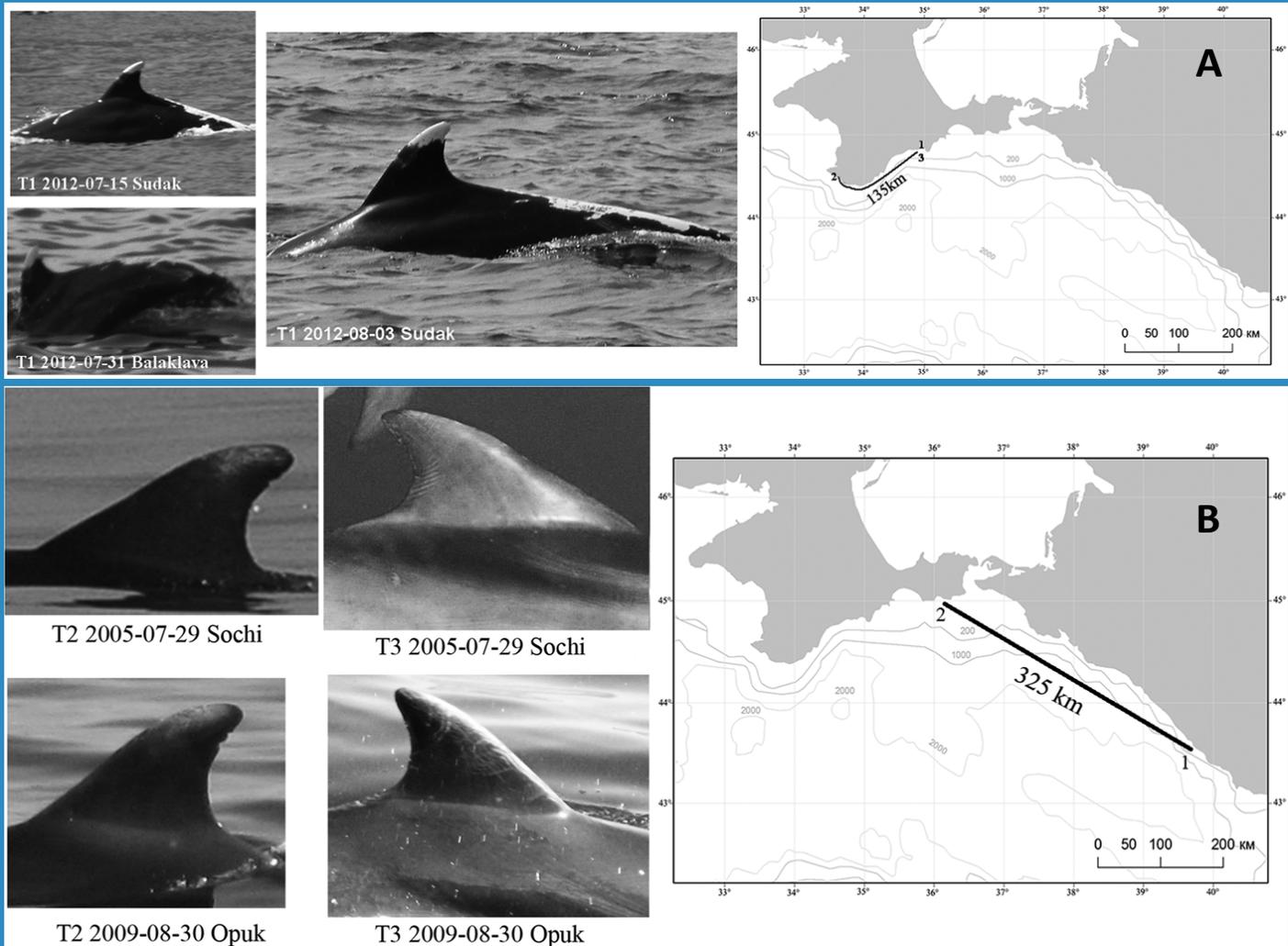


Figure 1: **A)** Lateral view of the bottlenose dolphin T1 which was recorded near Sudak and Balaklava. The records of a bottlenose dolphin individual observed across the different regions are joined with a line, and the distance between the records are indicated below the line. 1, Balaklava; 2, Sudak; 3, Opuk Cape. **B)** Dorsal fins of dolphins T2, T3 which were recorded near Sochi and Opuk. 1, Balaklava; 2, Opuk Cape. From: Gladilina et al., 2018.

Criterion B: Distribution and Abundance

Sub-criterion B2: Aggregations

The Karadag and Opuk IMMA is an important habitat for the largest population of bottlenose dolphins in the region. It hosts at least two groups of *T. t. ponticus* that form large and dense aggregations during the warm season, particularly in the western and in the eastern parts of the IMMA. The summer aggregation in the western part of the IMMA numbers between 600 and 1,600 individuals (based on different estimates). There is an estimated density of 4.5 individuals per km² in some local areas near the Sudak Bay, which has the greatest density of bottlenose dolphins throughout the Black Sea (Gladilina and Gol'din, 2016). Abundance estimates are based on the results from photographic mark-recapture surveys conducted between 2009-2013,

and a vessel line-transect survey in 2012 (Gladilina and Gol'din, 2016; Gladilina, 2018; Gladilina et al., 2018). Another large local population of bottlenose dolphins is regularly observed off the Kerch Peninsula, and contains at least a few hundred individuals, as estimated from photographic mark-recapture data (e.g. Fig 1) (Gladilina et al., 2018). Additionally, bottlenose dolphins are known to form large groups of at least 60 individuals in association with trawlers during sprat fisheries season (Gladilina, 2018).

Criterion C: Key Life Cycle Activities

Sub-criterion C1: Reproductive Areas

The IMMA is an important nursing area for bottlenose dolphins during the warm season. Mother and calf associations were seen in at least 50% of groups during the 2011-2014 warm seasons. Several associations were resighted between-years.

Criterion C: Key Life Cycle Activities

Sub-criterion C2: Feeding Areas

This IMMA has a high concentration of fish, including whiting, horse mackerels, sprat, picarel, thornback rays, and red mullets, which are important prey species of bottlenose dolphins (State of Biological Resources, 1995; Gladilina et al., 2012; Gladilina and Gol'din, 2014). The main behavioural activity recorded for bottlenose dolphins in the IMMA was foraging (Gladilina, 2012a; 2018). Also, mixed groups of bottlenose and common dolphins are frequently observed interacting with sprat trawling fisheries in the warm season (Gladilina, 2012b). Spectacular hunting by bottlenose dolphins on mullets is commonly observed in the coastal waters of the IMMA during the mullet migration. This includes beaching, a rare hunting strategy for bottlenose dolphins (Gladilina, 2018).



Figure 2: A group of Black Sea bottlenose dolphins. Photo courtesy Mare Nostrum by Costin Timofte.

Criterion D: Special Attributes

Sub-criterion D1: Distinctiveness

In the Karadag and Opuk IMMA, the Black Sea bottlenose dolphins have distinct external morphology: they exhibit a high prevalence of partially white (piebald) individuals. A total of 11% of bottlenose dolphins in this area are piebald which is the highest reported percentage in a local population of the species. Several partially white dolphins were repeatedly recorded during photo-ID surveys over several years, including one fully white animal which was regularly observed in the Sudak region between 2007 and 2013 (Gladilina et al., 2012; Gladilina et al., 2019). In the eastern part of the IMMA, several (ca. 10) individuals demonstrate beaching during foraging, which is a rare behaviour for *Tursiops* in general and unique for the Black Sea region (Gladilina, 2018). This hunting strategy is shared by several photo-identified individuals seen in the same area during several consecutive years.

Supporting Information

Birkun, Jr., A. 2002. The current status of bottlenose dolphins (*Tursiops truncatus*) in the Black Sea. In Report of the first meeting of the Parties to the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS). Document AC18-Inf. 2. 25 pp.

Birkun, Jr., A., Northridge, S.P., Willsteed, E.A., James, F.A., Kilgour, C., Lander, M. and Fitzgerald, G.D. 2014. Studies for carrying out the common fisheries policy: adverse fisheries impacts on cetacean populations in the Black Sea. Final report to the European Commission, Brussels, 347p.

Cetacean sightings in the Black Sea, Sea of Azov and Kerch Strait (CetSiBS). 2011. Dataset assembled by A.Birkun, Jr. and S.Krivokhizhin. EMODNet. <https://obis.org/dataset/db99b405-1b51-432b-86b6-cc77465d08c5>

Gladilina, E.V. 2012a. 'Observations of Cetaceans (Cetacea) in the waters of Karadag nature reserve and the adjacent waters. 2010'. Scientific Notes of Taurida V.I. Vernadsky National University. Series: Biology, chemistry, 25(64),2:51-59. [In Russian]

Gladilina E.V. 2012b. 'Variety of cetaceans feeding techniques in the coastal waters of the northern part of the Black Sea' V All-Russian Conference on Animal Behaviour. Abstracts Book: 45. [In Russian]

Gladilina, O.V. 2018. The bottlenose dolphin (*Tursiops truncatus*) in the waters of the northern Black Sea: biology and population structure. Dissertation submitted for the completion of the degree of Candidate of Sciences in Biology, qualification 03.00.08, zoology. Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine. Kyiv. 215 p.

Gladilina, E.V., Serbin, V.V. and Gol'din, P.E. 2012. 'Bottlenose dolphins (*Tursiops truncatus*) near trawler vessels in-volved in sprat fisheries in the waters of southern and south-eastern Crimea (the Black Sea)'. In Marine mammals of Holarctic, Suzdal: 165-166.

Gladilina, E.V. and Gol'din, P.E. 2014. 'New prey fishes in diet of black sea bottlenose dolphins, *Tursiops truncatus* (Mammalia, Cetacea)'. Vestnik Zoologii, 48(1):83-92.

Gladilina, E.V. and Gol'din, P.E. 2016. 'Abundance and summer distribution of a local stock of Black Sea bottlenose dolphins, *Tursiops truncatus* (Cetacea, Delphinidae), in coastal waters near Sudak (Crimea)'. Vestnik zoologii, 50(1):49-56.

Gladilina, E., Shpak, O., Serbin, V., Kryukova, A., Glazov, D. and Gol'din, P. 2018. 'Individual movements between local coastal populations of bottlenose dolphins (*Tursiops truncatus*) in the northern and eastern Black Sea'. Journal of the Marine Biological Association of the United Kingdom, 98(2):223-229. doi:10.1017/S0025315416001296

Gladilina, E., Baş, A., Shpak, O., Kryukova, A., Popov, D., Paiu, M., Savenko, O., Kopaliani, N., Ninua, L., Uludüz, N., Vishnyakova, K. and Gol'din, P. 2019. 'Geographical variation of piebaldism in Black Sea bottlenose dolphins'. WMMC Abstract Book, Barcelona: 273.

Gol'din P., Gladilina E., Öztürk A. A., Tonay A.M. In press. *Tursiops truncatus* ssp. *ponticus*. The IUCN Red List of Threatened Species

Krivokhizhin, S.V., Birkun, jr., A.A. and Radygin, G.Yu. 2012. 'Seasonal changes in distribution and abundance of cetaceans near the coast of the south-eastern Crimea'. In: Current fisheries and ecological problems of the Azov-Black Sea region, Proc. 7th Int. Conf. YugNIRO, Kerch, Volume 1:115-118 [In Russian].

Mikhalev, Yu.A. 2005a. 'The peculiarities of the distribution of the bottlenose dolphin, *Tursiops truncatus* (Cetacea), in the Black Sea'. Vestnik Zoologii 39:29-42. [In Russian]

Mikhalev, Yu.A. 2005b. 'The Peculiarities of the Distribution of the Harbour Porpoise, *Phocoena phocoena relicta* (Cetacea), in the Black Sea'. Vestnik Zoologii 39(6):25-35 [In Russian].

Öztürk A.A., Tonay A.M., Gol'din P., Vishnyakova K. In press. *Phocoena phocoena* ssp. *relicta*. The IUCN Red List of Threatened Species.

State Of Biological Resources Of The Black And Azov Seas (Reference Book). 1995. pp.1-64. Kerch: YugNIRO.

Tsalkin, V.I. 1940. 'Some observations on the biology of dolphins in the Azov and Black Seas'. Bul. Moscow society testing nature. Dept. Biol., 49(1):61-70 [In Russian].

Vishnyakova, K.A., Savenko, O.V., Oleinikov, E.P., Gladilina, E.V., Gorohova, V.R. and Gol'din, P.E. 2013. 'Shift of terms of spring migration of harbor porpoises in the Kerch Strait and north-eastern Black Sea in 2011-2012'. Trudy YugNIRO 51:32-35.

Vishnyakova, K.O. 2017. The harbor porpoise (*Phocoena phocoena*) in the Sea of Azov and the north-eastern Black Sea: population morphology and demography. Dissertation submitted for the completion of the degree of Candidate of Sciences in Biology, qualification 03.00.08, zoology. Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine. Kiev.

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**MARINE MAMMAL
PROTECTED AREAS
TASK FORCE**

IMMA

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since 1986

WDC
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Supported by:

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based on a decision of the German Bundestag

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