

# Kaliakra to Danube Delta IMMA

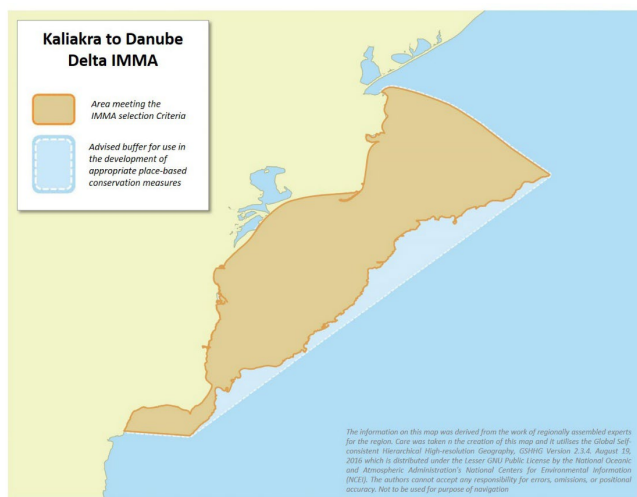
## Summary, continued.

There are several local subpopulations of bottlenose dolphins (Fig. 1) that have exhibited distinct residency patterns over several years. The coastal waters of the IMMA, including those in the Danube River mouth and the Kaliakra Cape, are an important feeding habitat for Black Sea cetaceans.

## Description

The IMMA comprises Bulgarian, Romanian, and Ukrainian shelf waters that are characterized by diverse habitats with mixed substrate (rocky, sandy and silty), and depths ranging between 10-60 m (Micu et al., 2007). Underwater meadows of eelgrass occur in shallow sandy regions sheltered from wave action and provide optimal habitat for numerous species of mussels, crustaceans, and fish. In the southern part of the IMMA, at depths to 25 meters, sandy sediments, occasionally combined with mud, form prime habitat for a number of important species of molluscs, crustaceans, and fish. In the deeper water, from 35 to 60 meters, the bottom is formed by sedimentary substrate (mud, sand, or mixed) that hosts reefs of blue mussel (*Mytilus galloprovincialis*). This type of reef plays a crucial ecological role in the ecosystem, connecting both benthic and pelagic endangered species such as turbot (*Scophthalmus maeoticus*), spiny dogfish (*Squalus acanthias*), sturgeons, and gobies. Currently, the extent and status of these mussel beds have diminished due to human pressures, namely transboundary eutrophication, mobile bottom-gear fishing and predatory pressure from the invasive alien rapa whelk (*Rapana venosa*).

In the limestone rocks off Cape Kaliakra, there are long, partially submerged sea caves that were once the main habitat of the extinct Black Sea population of Mediterranean monk seal (*Monachus monachus*) (Micu et al., 2007). The northern boundary of the area is demarcated by the Danube river, which provides nutrient rich water into the IMMA.



## Area Size

15,445 km<sup>2</sup>

## Qualifying Species and Criteria

Black Sea bottlenose dolphin –

*Tursiops truncatus ponticus*

Criteria A, B2, C2

Black Sea harbour porpoise –

*Phocoena phocoena relicta*

Criteria A, B2, C2

## Marine Mammal Diversity

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

## Summary

The Kaliakra to Danube Delta IMMA is located in the coastal and shelf waters of Ukraine, Romania and Bulgaria, extending from Hyrlo Prorva in the Ukraine in the north to Cape Kaliakra in Bulgaria in the south. It includes water depths from 1 m in the West to the 60 m depth contour in the eastern Bulgarian, Ukrainian and Romanian waters. The IMMA includes three EBSA regions: Danube Delta Marine Area, Kaliakra, and the Vama Veche – 2 Mai Marine Reserve. In the summer, the IMMA supports aggregations of two endangered species of Black Sea cetaceans: the Black Sea bottlenose dolphin (*Tursiops truncatus ponticus*) and the Black Sea harbour porpoise (*Phocoena phocoena relicta*).



Figure 1: A Black Sea bottlenose dolphin leaping from the water. Photo: Marian Paiu, Mare Nostrum NGO

## Criterion A: Species or Population Vulnerability

The IMMA contains important habitat for the survival and recovery of all three Black Sea cetacean species. Moreover, all three Black Sea subspecies are included in the IUCN Red List: Black Sea bottlenose dolphin and harbour porpoise are considered Endangered, whereas the Black Sea common dolphins are considered Vulnerable. Evidence for the presence of all three species is collected from regular vessel surveys in territorial waters (Fig. 2) (Popov, 2017-2020; Paiu et al., 2019a; 2019b; 2020a; 2020b; Gol'din et al., 2017) and two large scale aerial surveys (Birkun et al., 2014; Paiu et al., 2021). Studies of stranding events have shown the presence of all three species along the coast of the IMMA (Vasiliu, F. and Dima, L., 1990; Gladilina et al, 2020; 2021; Paiu et al., 2019b; 2020a; 2020b).

## Criterion B: Distribution and Abundance

### Sub-criterion B2: Aggregations

Two large-scale studies (conducted by Birkun in 2013, and the CeNoBS Survey in 2019) recorded aggregations of each Black Sea cetacean species within the IMMA. The largest aggregations of the bottlenose dolphins in the western Black Sea were found near the Constanta coast and the Kaliakra Cape (Paiu et al., 2021), and several very high-density areas for harbour porpoises were recorded within the IMMA near the Danube Delta (Birkun et al., 2014).

During the ANEMONE surveys, which were conducted in the spring and summer of 2019 and 2020 (Fig. 2), aggregations of all three cetacean species were observed in the territorial waters of Romania, in the marine zone of the Danube Delta, and near Constanta harbour and 2 Mai-Vama Veche Marine Reserve (Paiu et al., 2019; 2021). In another study conducted by the National Institute for Marine Research and Development "Grigore Antipa" in the same areas, aggregations of each of the three species, including groups of up to 50 individuals were recorded (Nicolae et al., 2017). In Ukrainian waters east and northeast to the Danube Delta, there are often aggregations of harbour porpoises and bottlenose dolphins, mostly reported during the summer season (Birkun et al., 2014; Gol'din et al., 2017; Gladilina, 2017). Additionally, aggregations of all the three Black Sea cetaceans are seen off Zmiinij Island, with groups recorded during each aerial and vessel survey in that area. Particularly large aggregations of harbour porpoises were recorded during the July 2013 vessel surveys (Birkun et al., 2014).

Ten vessel surveys conducted in Bulgarian territorial waters between 2017-2020 have revealed that the mean encounter rate for Black Sea harbour porpoise and bottlenose dolphin is higher in the IMMA than in the rest of the territorial waters (Popov, 2017; 2018; 2019; 2020). That gradient in density is used for defining the southern boundary of the IMMA.

In Ukrainian waters there is a local population of bottlenose dolphins, possibly of several hundred individuals, often seen in the summer. Within that group, there were 35 individuals photo-identified in 2019; one individual was recorded in 2017 and 2019 in the same area (Gladilina et al., 2020). In the territorial waters of Romania, in the Danube Delta Marine Protected Area, groups of harbour porpoises and bottlenose dolphins feeding and traveling in the same area were observed from summer to late autumn. Due to the influence of the Danube River, the turbidity in this region is very high, creating a preferable habitat for harbour porpoises (Nicolae et al., 2017). Bottlenose dolphins can be regularly encountered between Cape Midia and Constanta Harbour and in the south around Kaliakra (Nicolae et al., 2017; Paiu et al., 2021; Popov, 2019; 2020; Panayotova 2015a; 2015b).

## Criterion C: Key Life Cycle Activities

### Sub-criterion C2: Feeding Areas

Within the IMMA, the presence of harbour porpoise and bottlenose dolphin is often associated with the migration, spawning and feeding periods of prey fish, such as horse mackerel (*Trachurus mediterraneus*), turbot (*Scophthalmus maeoticus*), European sprat (*Sprattus sprattus*), Black Sea herring (*Alosa immaculata*), whiting (*Merlangius merlangus*), and European anchovy (*Engraulis encrasicolus*) (Smederevac-Lalic et al., 2018; Yankova, 2011). The highest density of harbour porpoises was detected in the spring, and coincided with animals congregating into larger groups. Similar observations were documented in offshore waters in late autumn (Popov, 2019). Higher abundance of bottlenose dolphins was detected in summer and autumn, which correlates with seasonal fish migration into the area. Finally, there are numerous anecdotal accounts of bottlenose dolphins and harbour porpoises feeding near the mouth of the Danube Delta (Gol'din et al., 2017).

Feeding behavior has been observed in all three cetacean species in the IMMA. Bottlenose dolphins and harbour porpoises have been observed feeding in shallow waters (Mare Nostrum Monitoring Program Report) in all seasons. In the southern part of the IMMA the high abundance of pelagic and demersal fish species is underscored by the presence of permanent fishing gear (i.e. pound nets), with

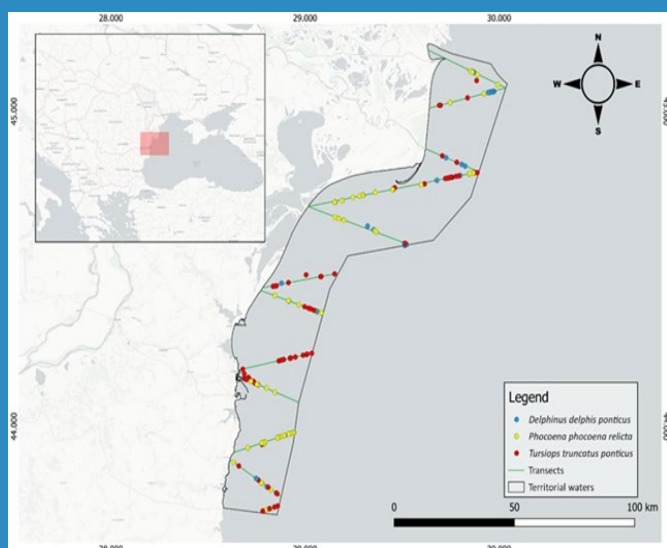


Figure 2: Sightings of all three Black Sea cetacean species between 2019-2020 off the coast of Romania. From Paiu et al., 2021.

porpoises and bottlenose dolphins regularly recorded near the fishing gear. Interaction with trawlers is well documented for bottlenose dolphins. Larger groups of feeding porpoises (more than 10) have also been observed at the site (Popov, unpublished).

## Supporting Information

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