

The background of the entire page is a photograph of two dolphins swimming in the water. Their dark, sleek bodies and curved dorsal fins are visible above the surface. The water is a light blue-grey color with gentle ripples. In the far background, a coastal town with buildings and a red-tiled roof is visible across the water.

Thermaikos Dolphin Project

Final Report

May – December 2021

**iSea, Non Profit Non-Governmental Organisation for the Preservation of the
Aquatic Ecosystems**

Thessaloniki, 2021

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iSea & Vulnerable Species Pillar

iSea is a Not for Profit Non-Governmental Organisation founded in March 2016, in Greece, with the aim to preserve, protect and restore the precious heritage of the aquatic environment. The organisation consists of a team of young, yet experienced scientists and professionals of various disciplines from marine biologists to specialists in environmental management and educators. The organisation strives to shed light on the foremost issues affecting our oceans and propose alternatives for a sustainable future. Its activities focus on 4 main pillars: Vulnerable species, Citizen Science, Human and Aquatic Ecosystems, and Aquatic litter. The tools utilised by iSea vary from scientific research to citizen science and environmental education and awareness. Biodiversity is fundamental for healthy ecosystems. Limited knowledge of Mediterranean species populations indicates the problem, as 1/3 of marine species cannot be assessed due to insufficient data. According to the United Nations Sustainable Development Goal 14, "Life on Water", sustainable management and protection measures for marine and coastal ecosystems must be taken for achieving the goal of healthy and productive oceans. In this context, iSea aims to increase and disseminate existing knowledge about vulnerable species in order to enhance scientific-based management and ensure their conservation, protection, and restoration to the extent that they fulfill their ecological role in achieving healthy and functional ecosystems. One taxonomic group of vulnerable species is Cetaceans and hence iSea developed Thermaikos Dolphin project.

Thermaikos Dolphin Project



(*Stenella coeruleoalba*)

In Greece there are 8 resident cetacean species: the fin whale (*Balaenoptera physalus*), the sperm whale (*Physeter macrocephalus*), the Cuvier's beaked whale (*Ziphius cavirostris*), the Risso's dolphin (*Grampus griseus*), the bottlenose dolphin (*Tursiops truncatus*), the common short-beaked dolphin (*Delphinus delphis*), the striped dolphin and the harbor porpoise

(*Phocoena phocoena*). "Thermaikos Dolphin Project" is the first systematic effort for monitoring the populations of cetaceans in the area of Thermaikos Gulf, which is heavily understudied in terms of cetaceans, and it is likely to be a key region for them. Thermaikos Dolphin Project consists of a systematic study on Thermaikos Gulf's cetaceans and environmental education activities in order to inform teenage and school aged children about marine mammals and the value of the local marine environment. More specifically, through Thermaikos Dolphin Project, the area's dolphin populations' abundance and distribution were studied for the first time in a systematic way for species that regularly or occasionally occur in the gulf. Meanwhile, to raise awareness about cetaceans, a variety of educational activities was developed, targeting different ages of participants with the aim to provide information about the different cetaceans' species, their characteristics, and the

main threats they face. All the activities were conducted in SANI resort. The project is implemented by [iSea](#) with the support of [Sani Resort](#) and in collaboration with the [Tethys Research Institute](#), the [University of Patras](#) and [ARION](#).

Surveys



For the surveys, iSea used the speedboat of SANI resort and a high resolution DSLR camera. The methodology used was developed in accordance with the protocol used by Tethys, in the [Ionian Dolphin Project](#). The primary step for the survey was checking for the correct weather conditions (sea state, wind, and visibility), then the project coordinator would inform the SANI marina for the survey, for the availability of the boat and to notify the port police. When on field, the iSea staff followed prefixed transects, designed to monitor the outer part of Eastern Thermaikos Gulf. During the transects iSea monitored the environmental conditions, such as sea state, wind and the time, while obtaining the track coordinates with a portable GPS (Garmin 22x). Simultaneously two members of the team were scanning the periphery of the boat up to

~200 m (depending on environmental conditions) for dolphins. At this stage the staff members were positive for tracking the dolphins. When the pod or a dolphin was located, the captain would approach the dolphins maintaining a forward progress at a slow, steady speed in an angle not more than 30 degrees and when approaching enough with a safe distance of 100 m maintaining a parallel course according to the [SMART protocol of the ACCOBAMS](#). At the same time, the other iSea staff would record the time, the coordinates, the species, the group size and finally the presence of calves. The presence or absence of birds and whether there was any boat disturbance, they were also noted when locating the pod. Then the captain would follow along with the pod and one staff member would be taking coordinates and the behaviour status every five minutes, while the other staff member would take photographs aiming at the dorsal fin, the tale, and the face of each dolphin. The team stayed with the pod of dolphins unless the animals would behave in stress, then the protocol was followed, and the captain would drive the speedboat away immediately as described in the SMART protocol. The behaviours of the dolphins were noted according to Stockin et al., (2006), (table 1).

Table 1: Behavior's status of dolphins adjusted from Stockin et al., (2006).

Behavioural status category	Description
Foraging	Dolphins observed in an effort to capture and consume prey, as evidenced by prey pursuit and/or fish tosses.
Normal Swim	Dolphins involved in steady movement, with regular and constant surfacing within the same regular and constant surfacing within the same area. Movements are slower and less consistent than those in travelling behaviour.
Travelling	Dolphins involved in persistent directional movement, often fast and occasionally porpoising clear of the water, and/or involving boat-riding.
Mill	Dolphins showing non-directional slow movement, usually staying close to the surface, and no apparent physical contact between individuals.
Socialising	Dolphins observed chasing and/or engaged in body contact with each other, including breaching and aspects of play and/or mating with other dolphins.
Resting	Dolphins observed at the surface but showing no movements, and often observed within tight group. Resting lacks the active components of the other behaviours.

For the data analysis, all the photoidentification analysis, all the photos taken would be sorted for blur pictures. Then the staff member would crop the photos, focusing on the dorsal fin. Then the photos from each sampling were matched additionally they would be compared with other individuals from other surveys. This allowed the creation of a catalogue with all the observed individuals as the dorsal fin of each dolphin is unique, and this facilitates its identification to the individual level. Each photo was given a different name such as "TT_THE_20210729_002_12", where TT indicates the species (i.e., *Tursiops truncatus*), then the location was in this instance was the same (i.e., Thessaloniki), the date, the number of dolphins "002" (i.e., second in the pod), and finally the number of the picture "12" (i.e., the twelfth picture). These codes were attributed to the registration of the dolphin observed along with the coordinates and the other environmental variables observed in the field.



Figure 1: A cropped photo of the dorsal fin of a Dolphin, the yellow arrows indicate the notches., and the violet the scars.

Results

In total 10 surveys were conducted (Table 2). The starting and ending point of the surveys was always the Sani's Marina (40°05'56.5"N, 23°18'39.5"E), from where iSea team followed routes alternately from south to north to study the area's dolphin populations' abundance and distribution systematically. From all the surveys, only two surveys were without an observation (20%).

Table 2: the number of surveys conducted during May to December, along with information about the presence/absence of dolphins and the sampling effort.

Nº Survey	Date	Presence/absence	Observation effort (mins)	Species encountered	Group size
1	25/05/2021	PRE	14	Common Dolphin	3

2	08/07/2021	PRE	56	Bottlenose dolphin	8
3	16/07/2021	ABSE	-	-	-
4	29/07/2021	PRE	26	Bottlenose dolphin	3
5	05/08/2021	PRE	56	Common Dolphin	10
6	11/08/2021	PRE	75	Bottlenose dolphin	1
7	18/08/2021	ABSE	-	-	-
8	01/09/2021	PRE	-	Bottlenose dolphin	
9	19/09/2021	PRE	49	Bottlenose dolphin	2
10	02/12/2021	PRE	59	Bottlenose dolphin	7

During the surveys two dolphin species were encountered, Bottlenose and Common dolphins. The total number of individual dolphin observations were 24 and 13 for bottlenose and common dolphin accordingly. The most common behaviour observed was "Travelling", but also other behaviours were noted such as "socialising".

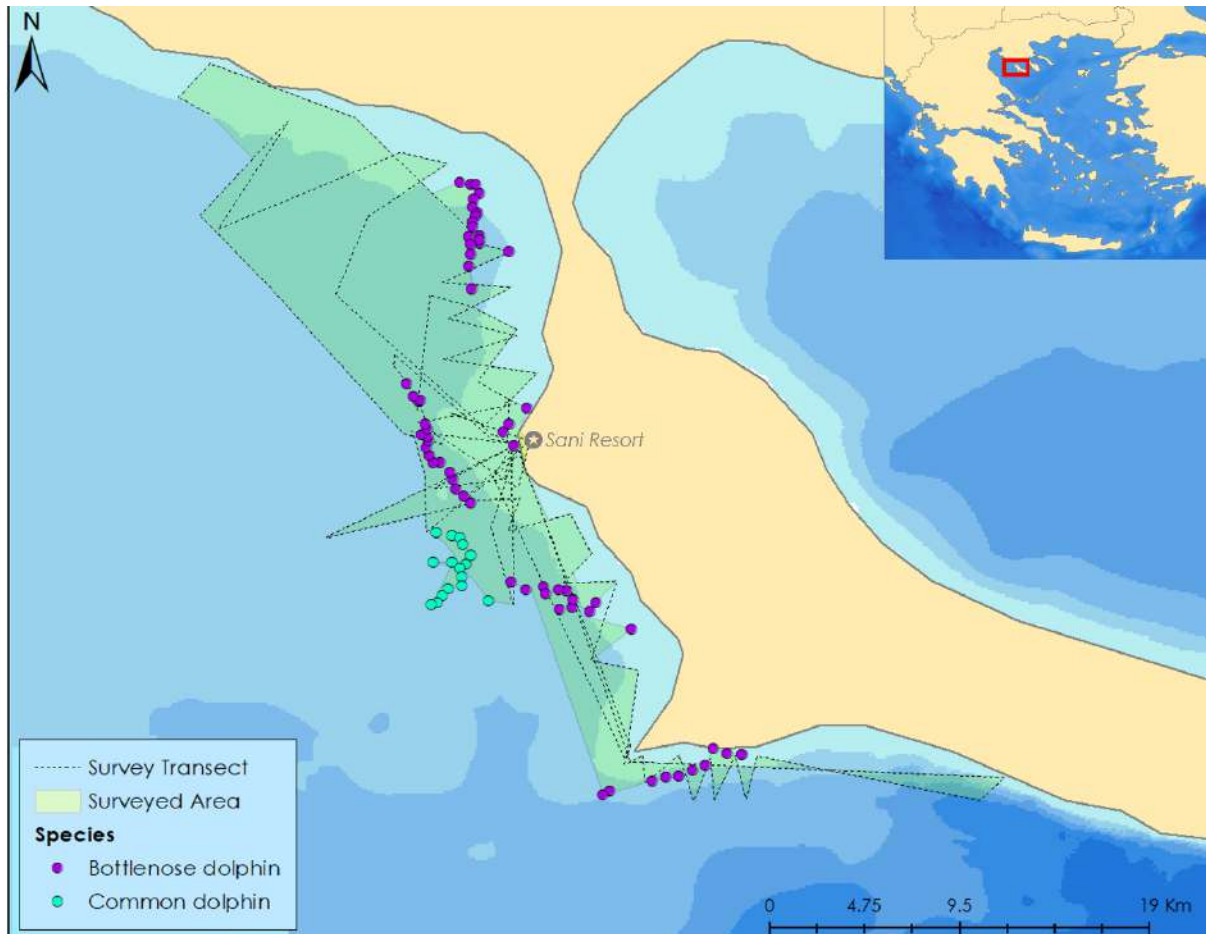


Figure 2: The survey effort between May to December visualised in ArcGIS, with the locations of the dolphin pods identified by the dots; the survey area in green and the transects in lines.

The maps (Figure 2) above, demonstrate the survey effort of iSea team and the dolphin sightings through the period of May to December 2021. The furthest sighting was 7.3 km from the shore while the closest was 50 m from the shore.

A preliminary estimation for of the frequency of dolphins' sightings and number of individuals per 60 min of search effort by month (table 3).

Table 3: IPUE, number of observed individuals per 60min search effort; SPUE, number of sightings per 60min search effort

Month	<i>Tursiops truncatus</i>		<i>Delphinus delphis</i>	
	SPUE	IPUE	SPUE	IPUE
May	-	-	0.18	0.5
July	0.36	1.58	-	-
August	0.11	0.11	0.11	1.07
September	1.64	1.64	-	-
December	0.5	3.5	-	-
Total	2.61	6.83	0.29	1.57

During six surveys (May to December 2021), 12 sufficiently well marked dolphins were photographed and matched. Although Thermaikos Dolphin Project is on early stage

and we cannot draw any conclusions yet about abundance and distribution of cetaceans, it is a very interesting case study given the little number of surveys and the high percentage of sightings. Additionally, spotting not only one cetacean's species but two, including the Common dolphin, which is considered as Endangered, compels the attention of studying further this area, to shed a light on this unexplored but ecologically important location.

Educational activities



In order to raise awareness about the rich biodiversity of the Greek seas and mainly about cetaceans, our project included educational activities for teenagers and younger children. A variety of activities were based on an advanced training booklet with the aim to provide information about the different cetaceans' species, their characteristics, and the main threats they face. All

the activities were based on the "Ocean Literacy" principles to make participants aware of human interaction with the sea.

Environmental games and their guidelines, as well as all the baseline information on the topic and the necessary materials for the activities, were provided from iSea to the staff of the teen and kids' club, so they could also organise and implement the activities.

A total number of 15 visits were implemented from iSea. From May to July the educational activities were conducted in the teens club, but since the participation of teenagers was rather low, since less than 30 children voluntarily attended the activities, the educational activities were implemented outdoors with the participation of the kids' clubs during August. A total number of 40 children from the kids' clubs participated in the outdoor activities during August, and 40 more children during our last visit that took place in the end of October.

The activities included table puzzles and games, presentation of informative material from different cetacean species and their characteristics, photo ID activities from developed catalogues and coloring pages.

Communication

For the effective communication of the project we created 14 posts on iSea's social media platform (Facebook, Instagram, Twitter & LinkedIn) in order to outreach more people and inform them about the progress of the program. Indicatively, there is a facebook posts with the statistics as given by "Facebook".



Figure 3: Post giving information on the biology of dolphins

Furthermore, articles were written in the press for the project and a list of those can be found below:

- [Thermaikos Gulf Dolphins to be Examined by iSea Members](#), Athens News
- [Monitoring the dolphins of the Thermaikos Gulf](#), e-kathimerini.com
- [Θεσσαλονίκη: Πόσα είναι τα δελφίνια του Θερμαϊκού;](#), ΜΑΚΕΔΟΝΙΑ
- [Τα δελφίνια του Θερμαϊκού καταγράφει και μελετά η iSea](#), ΜΑΚΕΔΟΝΙΑ
- [Θερμαϊκός κόλπος: Δύο διαφορετικά είδη δελφινιών κατέγραψε η iSea](#), ΕΘΝΟΣ

- [Tracking the Dolphins of Thessaloniki](#), GREECE IS
- [Τα δελφίνια του Θερμαϊκού καταγράφει η iSea](#), Anatropi News
- [iSea: Η οργάνωση από τη Θεσσαλονίκη που προστατεύει το υδάτινο οικοσύστημα](#), parallaxi
- [Monitoring the dolphins of the Thermaikos Gulf](#), Athens-News.gr
- [Θεσσαλονίκη: Δελφίνια παίζουν στα κύματα του Θερμαϊκού!](#), TyposThess
- [Δελφίνια: Η οργάνωση iSea οργώνει τον Θερμαϊκό](#), CITYNOW
- [Τα δελφίνια του Θερμαϊκού καταγράφει και μελετά η iSea](#), TIRNAVOSPRESS
- [Θεσσαλονίκη: Τα δελφίνια του Θερμαϊκού – Ο στόχος της μελέτης πίσω από τις εικόνες](#), NewsIT
- [Γιατί τα δελφίνια πηδούν έξω από το νερό; ΧΡΟΝΟΜΕΤΡΟ](#)
- [Η iSea καταγράφει και μελετά τα δελφίνια του Θερμαϊκού Κόλπου – Ποια είδη εντοπίζονται;](#) politic, gr
- [Θεσσαλονίκη: Τα δελφίνια του Θερμαϊκού καταγράφει η iSea](#), pressGreece.gr
- [Θεσσαλονίκη: Τα Δελφίνια Του Θερμαϊκού Κόλπου Μελετούν Μέλη Περιβαλλοντικής Οργάνωσης](#), thessnews.gr
- [Θεσσαλονίκη: Τα δελφίνια του Θερμαϊκού καταγράφει η iSea](#), Ναυτικά χρόνια
- [Τα δελφίνια του Θερμαϊκού καταγράφει και μελετά η iSea](#), newsbeast
- [Θεσσαλονίκη: Τα δελφίνια του Θερμαϊκού καταγράφει η iSea](#), taxidromos.gr
- [Τα δελφίνια του Θερμαϊκού καταγράφει η iSea](#), Επιλογές
- [Τα δελφίνια του Θερμαϊκού καταγράφει η iSea](#), Portnet
- [iSea | Καταγράφει και μελετά τα δελφίνια του Θερμαϊκού](#), Olympusmera.gr
- [Θερμαϊκός Κόλπος: Μέλη της περιβαλλοντικής οργάνωσης iSea μελετούν τα δελφίνια](#), iefimerida
- [Τα δελφίνια του Θερμαϊκού καταγράφει η οργάνωση iSea](#), EPT news
- [Τα δελφίνια του Θερμαϊκού καταγράφει η iSea - Ένα σπάνιο είδος](#), LIFO
- [Μεγάλος κίνδυνος εξαφάνισης του Κοινού δελφινιού στη Μεσόγειο](#), Tetragwno.gr²

Communication materials:

More photos and videos for communication can be found here:

<https://drive.google.com/drive/folders/1M2xNdqJnwRqrvilc2iA3yu6NebQVJHfi?usp=sharing>

Financial report

In the table below all the expenses done for Thermaikos Dolphin project are listed in a chronological order.

Date	Expense category	Expenses
5/17/2021	Consumables	-42.04 €
5/17/2021	Consumables	-12.40 €
5/18/2021	Educational materials	-29.76 €
5/25/2021	Travel expenses	-29.00 €
5/25/2021	Travel expenses	-20.00 €
5/25/2021	Subsides	-4.00 €
5/25/2021	Subsides	-3.80 €
5/28/2021	Educational materials	-230.00 €
6/4/2021	Educational materials	-88.28 €
6/10/2021	Consumables	-3.48 €
6/11/2021	Consumables	-15.00 €
6/14/2021	Consumables	-1.40 €
6/15/2021	Travel expenses	-20.01 €
6/22/2021	Travel expenses	-20.00 €
6/24/2021	Travel expenses	-20.00 €
7/13/2021	Travel expenses	-20.00 €
7/20/2021	Travel expenses	-75.00 €
7/20/2021	Travel expenses	-22.03 €
7/29/2021	Subsides	-3.60 €
7/29/2021	Travel expenses	-23.04 €
8/2/2021	Travel expenses	-20.00 €
8/2/2021	Travel expenses	-10.00 €
8/3/2021	Subsides	-3.30 €
8/4/2021	Travel expenses	-31.52 €
8/5/2021	Subsides	-13.00 €
8/5/2021	Travel expenses	-55.02 €
8/11/2021	Subsides	-7.60 €
8/11/2021	Subsides	-8.50 €
8/11/2021	Travel expenses	-31.30 €
8/11/2021	Subsides	-3.00 €
8/18/2021	Subsides	-9.00 €
8/18/2021	Travel expenses	-16.80 €
8/18/2021	Travel expenses	-33.23 €
8/24/2021	Travel expenses	-29.05 €
8/31/2021	Travel expenses	-20.00 €
8/31/2021	Travel expenses	-10.00 €
9/1/2021	Subsides	-12.00 €
9/1/2021	Subsides	-5.20 €
9/1/2021	Subsides	-0.90 €
9/1/2021	Subsides	-3.40 €

9/1/2021	Travel expenses	-20.00 €
9/7/2021	Subsides	-7.30 €
10/27/2021	Travel expenses	-38.00 €
10/27/2021	Travel expenses	-25.01 €
01/05/2021-30/12/2021	Personnel's compensation	-2,244.03 €
Total:		-3,340.00 €