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REVIEW ARTICLE

Türkiye's special environmental protection areas (SEPAs): an overview, targets and some proposals

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Abstract

Special Environmental Protection Areas (SEPAs) are the main marine protected areas (MPAs) in Türkiye. Currently, 19 SEPAs have been declared in Türkiye, both on land and at sea. Among them, 13 SEPAs were designated in Turkish waters between 1988 and 2025. In line with global targets and international commitments, SEPAs and other protected areas in Türkiye were analysed using GIS-based spatial analysis methods according to their location, size, categories, and resource values. Each marine SEPA has its own terrestrial and marine parts, except for the Finike Seamounts SEPA. The largest and latest SEPA is the Marmara Sea and its islands, outside of the geographical scope of Barcelona Convention, with 12,246.16 km^2, designated in 2021 with its borders extended in 2024. The smallest SEPA is Belek with 141.68 km^2. At least three of the SEPAs are of transboundary nature in the Aegean and Mediterranean Seas, namely the Finike Seamounts, Kaş-Kekova, and Datça-Bozburun SEPAs. The Black Sea does not have any SEPAs presently. Thus, it is highly recommended to designate SEPAs urgently to protect the Black Sea's marine biodiversity. Only 6.22% of Türkiye's coastal and marine waters have been designated as protected areas, of which 5.71% are existing SEPAs. This value is far from AICHI Target 11 and Kunming-Montreal Global Biodiversity Framework. Our proposal is to set new national targets to relevant authorities with the aim to increase MPAs and reach the AICHI target and Global Biodiversity commitment, mainly in the Black Sea and Eastern Mediterranean Sea.

Keywords: Türkiye, marine biodiversity, Special Environmental Protection Area, AICHI Targets, Kunming-Montreal Global Biodiversity Framework

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Introduction

Türkiye is a peninsular country surrounded by different seas with rich marine biodiversity. However, due to various types of pollution, habitats losses, overfishing, non-indigenous species, and climate change, many species are threatened or endangered. Başusta *et al*. (2024) reported that 63 marine species were threatened and legally protected in Turkish waters. The main conservation actions are illustrated by the establishment of marine protected areas, which aims at preserving the diversity and habitats alike in the Turkish waters for sensitive and endangered species (Güçlüsoy 2016).

Protected areas in Türkiye are designated according to different national legislations such as the Law No. 2863 on the Protection of Cultural and Natural Assets, the Law No. 2872 on the Environment, the Law No. 6831 on Forestry, and the Law No. 2873 on National Parks. Also, the Terrestrial Hunting Law No. 4915 and the Law on Water Products No. 1380 have implications for the protection and management of natural resources in and around protected areas. The Ministry of Agriculture and Forestry (MoAF) and the Ministry of Environment, Urbanization and Climate Change (MoEUCC) are responsible for determining and managing protected areas. The MoEUCC determines areas as Special Environmental Protection Areas and Natural Sites, while the MoAF determines areas such as National Parks, Nature Parks, Nature Reserve Areas, Nature Monuments, Wildlife Protection Areas, Ramsar Areas, Wetlands of National Importance and Wetlands of Local Importance. More than one protection category has been registered in many protected areas according to different legislations, depending on the resource values of the protected area. There are 15 different categories of protected areas in the Turkish legislation, which are shown in Table 1 and Figure 1 (www.tvk.csb.gov.tr, www.tarimorman.gov.tr/dkmp).

Meanwhile, there is no clear definition for the terminology of “Marine Protected Area” in the national legislation. Marine protected areas (MPAs) in Türkiye have been designated as Natural Protected Areas, Special Environmental Protection Areas, National Parks, Nature Parks, Nature Conservation Areas and Ramsar Areas. Assigning IUCN protected areas categories to Türkiye’s MPAs is currently an ongoing endeavour.

Special Environmental Protected Areas (SEPAs) are one of the main tools to efficiently protect species and habitats at an ecosystemic level. History of the SEPAs in Türkiye goes way back to 1988. The first three areas designated as SEPAs were Gökova, Fethiye-Göcek and Köyceğiz-Dalyan. Later on, several areas around Türkiye followed suit and included the realm of land with marine regions. The reasons for these designations were the presence of endemic, vulnerable, endangered, or critically endangered species, besides deep-sea species found near hydrothermal vents, cold seeps and mud volcanoes. The most

illustrative region is the Finike Seamounts (Öztürk 2022). In recent years, several studies were conducted on Turkish SEPAs, such as Öztürk (2009), Mavruk *et al.* (2020), Tezel *et al.* (2020), Öztürk (2022) and Keskin *et al.* (2023).

Table 1. Categories of protected areas in Türkiye (ha: hectare)

Protected areas category	Law N°	Number of protected areas	Surface (ha)
SEPA	2872	19 (13 SEPA related sea)	3,833,881
Natural Sites	2863	3,962	2,833,707
National Parks	2873	48	909,158
Nature Parks	2873	266	108,036
Nature Reserve Areas	2873	31	46,453
Nature Monuments	2873	110	8,356
Wildlife Conservation Areas	2873	85	1,165,448
Ramsar Areas	2873	14	184,487
Nationally Important Wetlands	2873	59	869,697
Wetland of Local Importance	2873	47	107,021
Protection Forests	6831	55	246,447
City Forests (Forest Parks)	6831	133	9,643
Gene Conservation Forests (in-situ)	6831	353	43,187
Seed Stands (in-situ)	6831	311	40,047
Seed Orchard (ex-situ)	6831	212	1,479

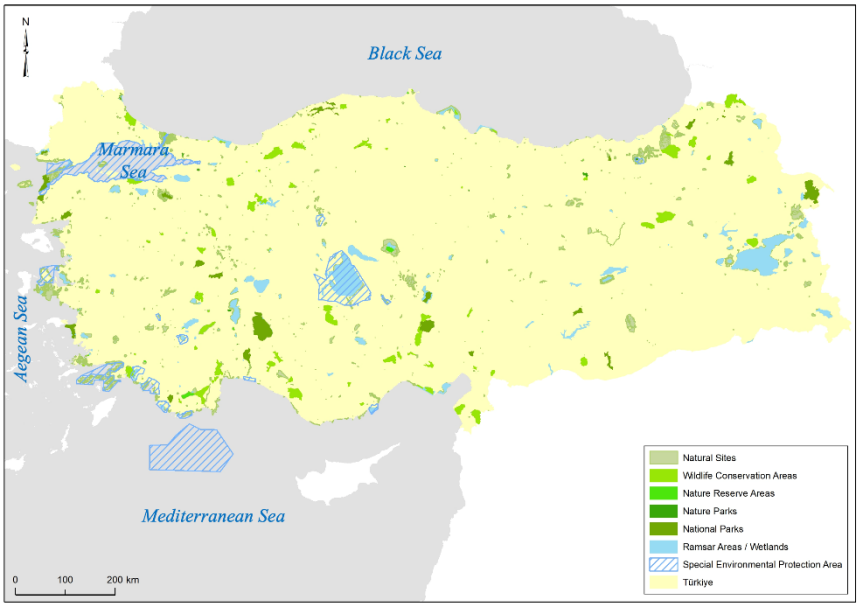

Figure 1. Protected areas according to the national legislation categories in Türkiye

Several discussions are currently still ongoing and Türkiye is striving to achieve the AICHI and 30x30 Targets for MPAs, within the Kunming-Montreal Global Biodiversity Framework. In addition, Türkiye is a part of Barcelona and Bucharest Conventions and Protocols of CBD. An effective and robust network of protected areas is necessary for the marine conservation for Turkish waters.

The aim of this study is to elaborate an overview of Turkish SEPAs' characteristics such as size and some other peculiarities. Additionally, the goal of the present study is to improve our understanding about (i) the compatibility of Turkish SEPAs with AICHI Targets, (ii) the overlapping protection zones between Türkiye and Greece as two coastal countries coast to coast in the Aegean Sea, and finally (iii) to make a size proposal for the Black Sea SEPAs, which will further remediate to the gap identified to fulfil our obligations toward the AICHI commitments.

Materials and Methods

All kinds of information about Turkish SEPAs were searched, including grey literature, to find SEPAs' implementation plans, updated maps, and verification of SEPAs' borders (Table 2). In order to calculate the total protected marine area (i) the Statistical Reports of Protected Areas and Nature Conservation, published by the MoAF (General Directorate of Nature Conservation and National Parks), (ii) the Protected Area Management System (SAYS) database (Tezel *et al.* 2013) developed by the MoEUCC (General Directorate of Natural Assets Protection) and finally (iii) the Nationally Designated Areas data (NatDa-2024) created for Türkiye in accordance with the agreement to participate in the European Environmental Information and Observation Network (EIONET) were collected and used.

Along with global protected areas targets, overlapping management regimes are the main drivers of overlapping protected area definitions. Geographic Information System (GIS) analysis helps to determine the current status of protected areas and to manage the area by clearly quantifying the degree of overlap and complementarity between different protected areas categories (Dudley 2008; Wu *et al.* 2020) Overlapping status in protected areas were eliminated and reduced to a single surface. All designated protected area data were analysed via GIS software (ArcGIS and QGIS), while terrestrial and MPAs surfaces were calculated in function of the coastline.

To calculate the total protected marine area, all boundaries data of protected areas were analysed with spatial statistic methodology. In the spatial analysis of protected areas, basic analysis tools such as overlap, intersection and union were performed. With overlap tools, it was determined where different protected areas overlapped, geometric intersections were calculated with intersection tools and with union analysis, areas where all features overlap were determined. This task

can be achieved following spatial analysis methods, although several complex considerations should be taken into account such as; (i) protected area declared with multiple categories and different geometries at the same location (i.e., different national legislations causing overlapping areas); (ii) designated protected area covering terrestrial and marine area (i.e., includes both terrestrial and marine areas); (iii) designated protected area at sea (i.e., marine area) and finally (iv) designated protected area on land (i.e., terrestrial area).

Table 2. Information on the datasets used in the present study

Data Type/Name	Data Source	Format	Database
TR-Protected Areas (Law No. 2872)	MoEUCC	Polygon	SAYS
TR-Protected Areas (Law No. 2873)	MoAF	Polygon	ATLAS
CDDA reports (NatDa-2024)	MoEUCC	Polygon	National database
TR-Coastline	MoEUCC	Polyline	National database
Greece Protected Areas-2024	UNEP-WCMC and IUCN	Polygon	WDPA

CDDA: Common Database on Designated Areas; MoEUCC: Ministry of Environment, Urbanization and Climate Change; MoAF: Ministry of Agriculture and Forestry; UNEP: UN Environment Programme; WCMC: World Conservation Monitoring Centre; IUCN: International Union for Conservation of Nature; SAYS: Protected Area Management System in Türkiye; ATLAS: National Geodatabase in Türkiye; WDPA: World Database on Protected Areas

In this study, data belonging to protected areas were analysed. Data were cleaned off duplicates before analysis. Unentered/missing data were edited with relevant experts to ensure consistency in the dataset. All protected area categories were combined as a single surface via overlap analysis. For overlapping statuses in protected areas, the outer boundary was taken into account without regard of conservation categories. Protected areas were reduced to a single surface with respect to the outer boundary after merging all protection categories at an equivalent level. The protected area surface was computed as sea and land areas according to the Turkish coastline with intersection analysis. In the current study, protected areas including both terrestrial and marine areas were visualized. Area values and percentage distribution were calculated. Thus, protected areas with both terrestrial and marine areas were presented.

Findings and Analysis

For a considerable duration, the definition of PAs has been 'fragments of land and sea governed by laws and other effective means and established to ensure the continuity and conservation of biological diversity and natural and cultural resources' (International Union for Conservation of Nature - IUCN 1994). Subsequently, a revised definition was proposed, stating that PAs are 'clearly defined geographical areas established, authorised and managed through laws and

other effective means for the long-term protection of nature with ecosystem services and cultural values' (Dudley 2008). The latter emphasises the clear definition of PAs in terms of geographical boundaries. Fifteen different categories of protected areas were found in the Turkish legislation (Figure 1). In addition to SEPAs in Türkiye, there were also protected areas that have been declared according to the Law No. 2873. These protected areas are smaller than SEPAs and are mostly terrestrial. However, some of the terrestrial areas are connected to marine areas. The main protected areas declared under the Law No. 2873 are listed in Table 3 and shown in Figure 2.

Table 3. Major protected areas designated under the Law No. 2873

N°	Name	Protection category	Total areas (ha)	Marine areas (ha)	Terrestrial areas (ha)	Site values	Year*
1	Büyük Menderes Delta Dilek Peninsula	National Park	27.62	9.14	18.48	natural, geological, archaeological	1966
2	Gelibolu Peninsula	National Park	33,439.00	855.00	32,584	historical	1973
3	Kazdağ	National Park	20,951.00	5.00	20,946	natural, geological, archaeological	1993
4	Yumurtalık Lagoon	Wetland	19,842.00	11,829.00	8,013	natural	1994
5	Ayvalık Islands	Nature Park	19,639.00	14,829.00	4,811	natural	1995
6	Troya	National Park	13,526.00	253.00	13,273	historical	1996
7	Marmaris	National Park	29,218.00	4.15	25,069	natural	1996
8	Akyatan	Wetland	16,366.00	1,851.00	14,515	natural	1998

Year*: Year of declaration

In this study, all protected areas declared in Türkiye were included in the calculation of terrestrial and marine protected areas. However, the areas declared under the Law No. 2873 were sampled among the areas with a marine area larger than 10,000 ha or important protected areas (Table 3). Table 4 listed all marine SEPAs along the Marmara, Aegean, and Mediterranean Seas, as shown in Figure 3.

Thirteen SEPAs with terrestrial parts were found inside Turkish waters. Five of these SEPAs were found in Muğla Province (Datça-Bozburun SEPA, Patara SEPA, Fethiye-Göcek SEPA, Gökova SEPA and Köyceğiz-Dalyan SEPA). A list of SEPAs sorted by designation year in the Turkish parts of the Aegean, Mediterranean and Marmara Seas was depicted in Figure 2.

No	Name	Protection Category	Year of Declaration
1	Dilek Peninsula-Büyük Menderes Delta	National Park	1966
2	Gelibolu Peninsula	National Park	1973
3	Kazdag	National Park	1993
4	Yumurtalık Lagoon	Wetland	1994
5	Ayvalık Islands	Nature Park	1995
6	Troya	National Park	1996
7	Marmaris	National Park	1996
8	Akyatan	Wetland	1998

Figure 2. Major MPAs designated under the Law No. 2873 and the distribution of SEPAs in Turkish waters.

Among them, the largest and latest designated SEPA was the Marmara Sea and its islands with 12,246.16 km^2, which was outside of the geographical scope of the Barcelona Convention. This SEPA was designated in 2021 and its borders were extended in 2024. The smallest area was Belek SEPA with 141.68 km^2 in the Eastern Mediterranean Sea. Designation criteria of SEPAs are based on the relevant Biodiversity Protocols of the Barcelona Convention, Bern Convention, Ramsar Convention and the Convention of Biodiversity commitments for endangered species such as the Mediterranean monk seal, seagrasses, sea turtles, sharks species, etc. In addition, the habitat protection was considered along the decision process. The decision was also taken upon the urgent need to preserve peculiar habitats like those in Finike Seamounts SEPA and to protect the marine life after the recent heavy sea-snot events within the Marmara Sea.

Thirteen SEPAs were found in Turkish waters with terrestrial parts. Table 4a,b listed all marine SEPAs along the Marmara, Aegean and Mediterranean Seas including information about total area, management plan, and responsible authorities. Among them, the area distribution ratio of SEPAs marine and terrestrial parts were 87.92% and 12.08%, respectively. Overall, the total coverage of 13 SEPAs was 30,032.31 km^2, while the marine regions within SEPAs extended to 26,403.25 km^2 and the terrestrial parts remained as 3,629.06 km^2.

No	SPECIAL ENVIRONMENTAL PROTECTED AREAS (SEPA)	YEAR OF DECLARATION
1	GÖKOVA	1988
2	FETHİYE-GÖCEK	1988
3	KÖYCEĞİZ-DALYAN	1988
4	DATÇA-BOZBURUN	1990
5	KAŞ-KEKOVA	1990
6	PATARA	1990
7	GÖKSU DELTA	1990
8	FOÇA	1990
9	BELEK	1990
10	GULF OF SAROS	2010
11	FİNİKE SEAMOUNTS	2013
12	GULF OF KARABURUN ILDIR	2019
13	MARMARA SEA AND ISLANDS	2021

Figure 3. Distribution of SEPAs in Turkish waters as of 2025.

According to Begun *et al*. (2012), MPAs cover up to 6.57% of Türkiye's territorial water. In contrast, Şekercioğlu *et al*. (2011) mentioned that the coverage of protected areas for terrestrial regions is 1.89% with marine areas reaching 2.43% of Türkiye's surface, including territorial waters up to 12 nautical miles. In fact, all Turkish territorial waters' breadth is not 12 nautical miles, like in the Aegean Sea. Nevertheless, for the moment, coverage percentage for marine areas has increased due to recently declared areas such as Finike, Karaburun and Marmara. According to Ceylan (2022), protected areas level ranged from 6.00% to 7.00% in Türkiye, which is smaller than the averaged coverage of 25.90% in the European Union (EU) countries. Based on the previously mentioned data, Türkiye has not been able to achieve the AICHI Target 11, which has yet to be fulfilled in 2020 or 2030 Biodiversity commitments.

In 2010, Parties to the Convention on Biological Diversity (CBD) adopted a Strategic Plan for the biodiversity with the 20 AICHI Biodiversity Targets which were expected to be achieved by 2020. Target 11 sets out goals for protected and conserved areas in terrestrial, marine, and freshwater ecosystems. Furthermore by 2020, at least 17% of terrestrial areas of particular importance for biodiversity and ecosystem services were conserved through effectively and equitably managed, ecologically representative, and well-connected systems of protected areas and other effective area-based conservation measures and were at last integrated into the landscape and seascape (CBD 2022a).

Table 4a. List of SEPAs in Turkish waters with the sum of SEPAs, area of distribution and country sea/land surface

N°	SEPA	Total areas (ha)*	Marine area (ha)*	Terrestrial area (ha)*	Diversity studies	Management plan	International Legislative Binding Agreements**	Authority responsible for the public announcement
1	MARMARA SEA AND ISLANDS	1,224,616.250	1,177,923.20	46,693.00	Yes	Pending	HD, BD	PD
2	FINIKE SEAMOUNTS	1,122,885.000	1,122,885.00	0.00	Yes	None	BaC	CMD
3	GÖKOVA	109,279.000	81,776.70	27,502.30	Yes	Yes	BeC, BaC	CMD
4	DATÇA-BOZBURUN	144,389.000	73,663.00	70,726.00	Yes	Yes	BeC, BaC	CMD
5	SAROS BAY	73,021.000	53,834.00	19,187.00	Yes	Yes	BaC	CMD
6	KARABURUN-ILDIR BAY	94,656.770	51,064.00	43,592.80	Yes	Yes	BaC	PD
7	FETHİYE-GÖCEK	80,537.000	34,011.00	46,526.00	Yes	Yes	BeC, BaC	CMD
8	KAŞ-KEKOVA	27,130.884	16,178.00	10,952.90	Yes	Yes	BaC, HD	CMD
9	PATARA	36,427.903	9,224.00	27,203.90	Yes	Pending	BaC, HD	CMD
10	GÖKSU DELTA	22,830.000	8,078.00	14,752.00	Yes	Yes	RC, HD, BD	CMD
11	FOÇA	7,144.000	5,178.00	1,966.00	Yes	Yes	BC	CMD
12	KÖYCEĞİZ-DALYAN	46,146.000	4,084.00	42,062.00	Yes	Yes	EC, HD, BD	CMD
13	BELEK	14,168.000	2,425.60	11,742.40	Yes	Yes	BaC, HD	CMD

*Number and area sizes related to SEPAs were obtained through the SAYS application, which provides geographical data of the Ministry of Environment and Urbanization (General Directorate of Protection of Natural Assets).

**HD: Habitat Directive; BD: Bird Directive; BaC: Barcelona Convention; BeC: Bern Convention; RC: Ramsar Convention; CMD: Council of Ministers Decision before 2018; PD: Presidential Decree after 2018.

Table 4b. List of SEPAs in Turkish waters with the information on official announcement

N°	SEPA	Official Gazette First Announcement Date / Issue	Official Gazette Border (Change_1)	Official Gazette Border (Change_2)	Official Gazette Border (Change_3)
1	MARMARA SEA AND ISLANDS	05.11.2021 / RG.4758	07.09.2024 / RG.32655	N/A	N/A
2	FINIKE SEAMOUNTS	16.08.2013 / RG.28737	N/A	N/A	N/A
3	GÖKOVA	5.07.1988 / RG.19863	21.11.1990 / RG.20702	22.12.2010 / RG.27793	N/A
4	DATÇA-BOZBURUN	21.11.1990 / RG.20702	N/A	N/A	N/A
5	SAROS BAY	22.12.2010 / RG.27793	N/A	N/A	N/A
6	KARABURUN-ILDIR BAY	15.03.2019 / RG.30715	N/A	N/A	N/A
7	FETHİYE-GÖCEK	5.07.1988 RG.19863	02.03.1990 / RG.20449	21.05.2000 / RG.24055	09.12.2006 / RG.26371
8	KAŞ-KEKOVA	2.03.1990 / RG.20449	09.12.2006 / RG.26371	N/A	N/A
9	PATARA	2.03.1990 / RG.20449	13.06.2007 / RG. 26551	13.10.2020 / RG.31273	N/A
10	GÖKSU DELTA	2.03.1990 / RG.20449	09.12.2006 / RG.26371	N/A	N/A
11	FOÇA	21.11.1990 / RG.20702	13.06.2007 / RG.26551	N/A	N/A
12	KÖYCEĞİZ-DALYAN	5.07.1988 / RG.19863	02.03.1990 / RG.20449	21.05.2000 / RG.24055	N/A
13	BELEK	21.11.1990 / RG.20702	N/A	N/A	N/A

Overall areas with marine and terrestrial areas of SEPAs were calculated according to Türkiye's surface (Table 4). Based on these calculations, SEPA marine areas covered up to 26,403.25 km^2, the percentage for marine SEPAs was 5.71% relative to Türkiye's total sea surface and the percentage of terrestrial SEPAs was 0.46% relative to Türkiye's total land surface, which summed up to a total of 6.17%. All other protected areas' marine parts, under the Law No. 2873, amounted for 2,347 km^2 and had a coverage of 0.51%. Table 4 especially highlighted SEPAs alongside the Turkish coasts in addition to all the other protected areas which summed up to a total of 28,750.25 km^2 of marine areas. Only 6.22% of Türkiye's coastal and marine waters have been designated as protected areas as of late, of which 5.71% are existing SEPAs. It is obvious that these figures are below the commitments indicated by Türkiye. As a result, more MPAs are required to protect all vulnerable ecosystems. Nevertheless, SEPAs are the main MPAs in Türkiye with most of SEPAs having management plans and biodiversity studies. All SEPAs have been designated due to the conservation priority for vulnerable species or land, but the Marmara Sea was designated only after the sea-snot/mucilage events.

Türkiye's National Biodiversity Action Plan (2018-2028) is an annexe to the National Biodiversity Strategies and Action Plans (NBSAP) (2007-2017). It concluded that the National Biodiversity Strategy is in line with the AICHI Biodiversity Targets (CBD 2022b). According to Türkiye's UNCBD 6th National Report published on 12 March 2020, recent efforts were reported to be progressing towards the AICHI Targets but at an insufficient rate for Türkiye (CBD 2022c).

Türkiye is a state member to most of the major international, regional, and environmental protection treaties such as ACCOBAMS, CBD, CITES, Ramsar, Barcelona, Bucharest, and Bern Conventions. Nevertheless, marine protection action is, of course, an on-going effort, which requires vigilance, continuity, adequate funding, human dedication, appropriate policies and more importantly implementation of those action plans. Besides AICHI Targets, Kunming-Montreal Global Biodiversity Framework also constitutes another goal for Türkiye's commitments for a better protection of the planet.

Among Türkiye's SEPAs, the most remarkable one was Kaş-Kekova SEPA, due to its overlapping coverage with the borders of Finike Seamounts SEPA. Furthermore, there is only 15 km separating Kaş-Kekova SEPA from Finike Seamounts SEPA. This is also important in terms of connectivity, as underlined in Figure 3. Mavruk *et al*. (2020) reported that ichthyoplankton samples were collected at five stations and a significantly higher number of eggs were found in Kaş-Kekova SEPA when compared to other regions in both seasons. Datça-Bozburun SEPA was also another overlapping zone between the two states, Greece and Türkiye. Öztürk and Gönülal (2024) reported that for marine

conservation two neighbour countries can cooperate at least for the sake of high-sea areas.

The Kastellorizo Greek Island was the closest to Kaş-Kekova SEPA with only less than 1 km separating them apart. Thus, it can be a good governance model for bilateral transboundary cooperation between Türkiye and Greece, in terms of highly migratory species such as sea turtles, sharks, cetaceans and sea birds (Figure 4).

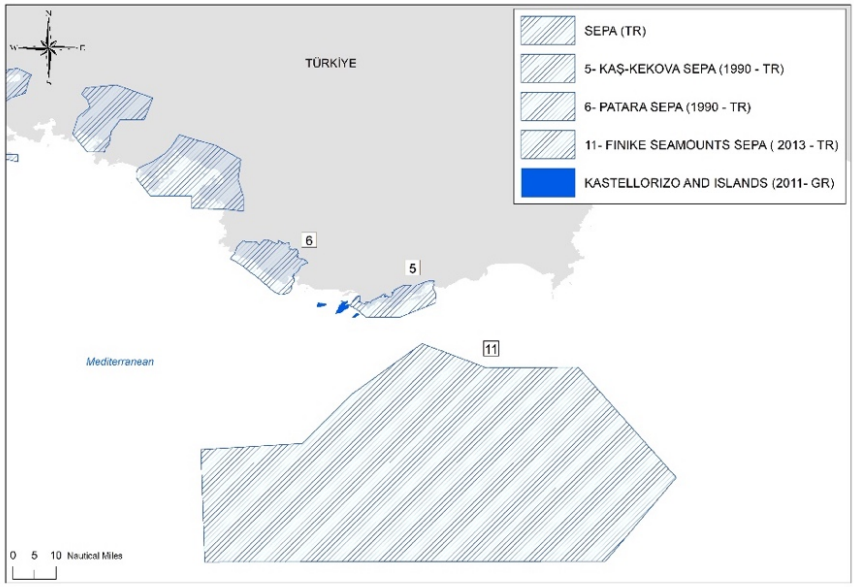

Figure 4. Protected areas of Kastellorizo Greek Island, which are the closest to Turkish SEPAs

It is well-known that no MPAs were designated yet in the Turkish part of the Black Sea, even though the Turkish coastline is long enough to allow them and several areas already proposed by Öztürk *et al.* (2013), which constitute only 2% of Turkish territorial waters in the Black Sea, covering a total surface area of 1,189.9 km^2, as shown in Figure 5.

In the Climate Change Mitigation Strategy and Action Plan (2024-2030), it was reported that Türkiye aimed at "*increasing the proportion of land and marine protected areas to 30% in line with the targets of the Kunming-Montreal Global Biodiversity Framework adopted by the 15th Conference of the Parties to the Convention on Biological Diversity and the EU Biodiversity Strategy."* The goal was to increase land and MPAs surfaces, in accordance with international conventions and EU strategies (MoEUCC 2023).

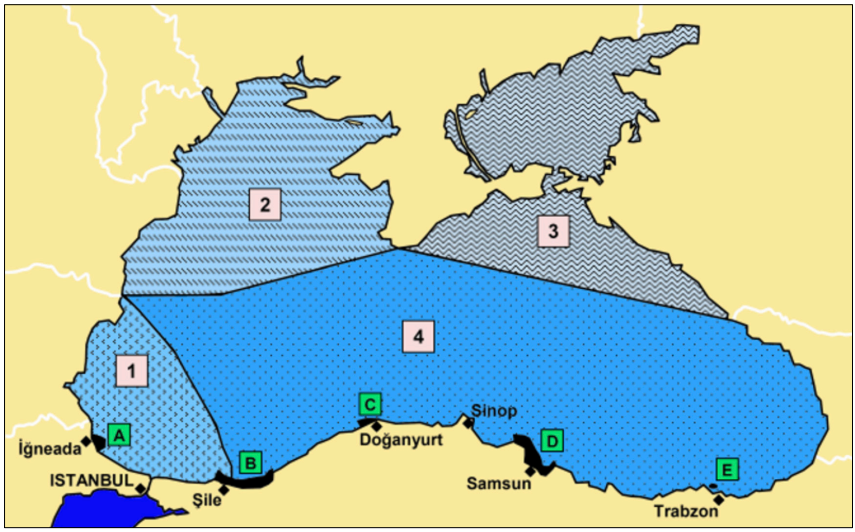

Figure 5. Sub-ecoregions of the Black Sea and proposed MPAs in Turkish Black Sea waters. 1, Pre-Bosphoric Region; 2, North-western Shelf; 3, Kerch Strait; 4, Southern Part. A, İğneada; B, Şile-Kefken; C, Doğanyurt; D, Samsun deltas; E, Mezgit Reef, after Öztürk *et al.* (2013).

The present study enabled an overview for current MPAs and potential MPAs proposed in the past. The idea behind these proposals is to improve biodiversity status by protecting ecosystems, species and genetic diversity, in line with global targets for the 2030 process. Five distinct zones were proposed for MPA designation in the Black and Mediterranean Seas in hotspots suggested by scientific studies, covering a total surface area of 37,094 km^2. The largest site proposed was Mersin-Northern Cyprus, while the smallest was Mezgit Reef. Protected area at sea and proposed SEPA at sea total surface reached 65,844 km^2. According to the calculation in the present paper, if the new proposed protected areas at sea are accepted and designated by the Turkish government, the total protected areas percentage will be 14.25 % and, in that case, would at least reach AICHI targets. MPAs boundaries were determined based on scientific research conducted in the Black and the Mediterranean Seas to date (Figure 6).

Another area was proposed as a potential marine environmental protected area in the Mediterranean Sea with the region of Mersin-Northern Cyprus (Gücü and Öztürk 2011), based on the high marine biodiversity values such as spawning ground of bluefin tuna and Mediterranean monk seal habitats and presence in the area between Taşucu and Anamur.

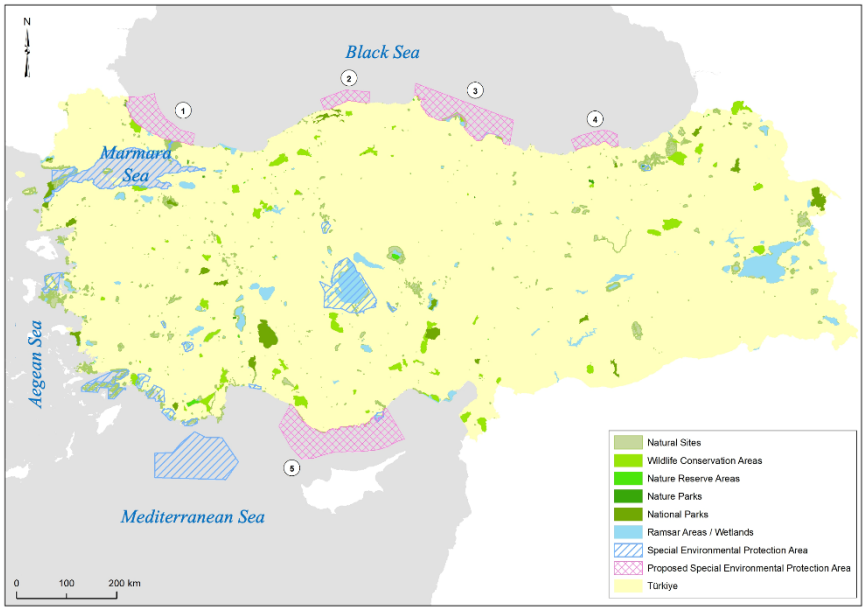

Figure 6. Summary of protected areas found in Türkiye with new SEPAs proposed from 2011 and 2013 (Shaded areas)

Discussion

The proposed MPAs will form the basis of endeavours towards a global goal. A conservation strategy compatible with global biodiversity frameworks should aim at the protection of marine and coastal species. In order to combine conservation policies with global trends and commitments in Türkiye, the identification and monitoring of marine/coastal habitats should be ensured while environmental policies are strengthened.

A list of marine habitat types for Türkiye should be updated and natural habitat types should be defined. A marine habitat list should be prepared that includes basic marine and coastal habitats such as seagrass meadows, coralligenous communities, dunes, mud flats, deep-sea habitats, and coastal lagoons that play an important role in the conservation of biodiversity of both Black Sea and Mediterranean Seas. Habitat typologies will be especially useful to protect Türkiye's marine ecosystems, such as in the Black Sea, which is under threats, such as non-indigenous species, IUU (Illegal, Unreported and Unregulated) fishing, pollution and climate change (Zaitsev and Öztürk 2001; Topçu and Öztürk 2010; Öztürk 2013). To reverse this negative trend, more MPAs and management efficiency are especially urgently needed in the Turkish part of the Black Sea.

To ensure scientific accuracy, GIS-based spatial analysis, field surveys and biodiversity databases including data from previous projects carried out by national marine research institutes and expert consultancies should be used. Factors such as habitat representativeness, relative surface area, ecological status and restoration potential should be evaluated during MPAs determination process. Geographical coverage, biodiversity components and sensitivity of the habitat to environmental threats including pollution, climate change and coastal development should be assessed.

A comprehensive digital map integrating environmental threats, conservation priorities and restoration opportunities should be developed. This map will encompass overlaying data on pollution sources, habitat degradation, climate change impacts and existing protected areas and will provide visual representation of vulnerable points to assist decision making.

The main problems of the SEPAs' management are the lack of coordination among local stakeholders, disputes on fisheries laws by fishers/fisheries cooperatives, weaknesses of law-enforcement for marine pollution/illegal coastal usage in Türkiye. The lack of marine spatial planning among sectors, which use coastal areas for docking in harbours, yachting and aquaculture, is also a tremendous setback. As such, cooperation among sectors and stakeholders is of paramount importance.

The conservation of marine biodiversity requires public participation and local cooperation. In that sense (i) educating the local public, (ii) participation of the aforementioned public to the conservation actions, and (iii) raising awareness are vital steps with increasing importance. In that context, education of local people, especially fishermen, also constitutes a crucial element. Education programs on these issues will contribute to enhance coordination efforts between local actors such as stakeholders, fishermen, associative entities, and law enforcement. Spatial planning organizing at a local scale with further develop into well-organized networks, which will positively impact at greater scales (decision-makers and law enforcement). Recent initiatives were taken during the mucilage events in the Marmara Sea with the organization of many symposia, conferences and meetings between scientists, civil society organisations, municipalities and other actors involved in the conservation, which enabled the designation of the Marmara Sea and its Islands as a SEPA.

More marine protected area is needed for Türkiye's commitments (Öztürk 2009, 2013, 2022; Öztürk *et al.* 2012, 2013; Öztürk and Gönülal 2024) and potential MPAs should be identified based on habitat diversity and ecological integrity through a comprehensive digital map. It should include field data validation and stakeholder consultations to ensure compatibility with global studies. Studies should be conducted by creating a standardized data form to systematically document ecological, biological and habitat characteristics. This approach will

facilitate comparative analysis, decision-making and long-term monitoring for effective area management. In fact, all proposed area in both the Black Sea and Mediterranean part of Türkiye have been studied in terms of biodiversity component. Besides, potential sites for Other Effective area-based Conservation Measures (OECMs) may bring added-value for marine conservation in Turkish coasts and they should be investigated further.

Finally, all SEPAs need a long-term scientific monitoring program for better understanding of both benthic and pelagic biodiversity components. The effective management of SEPAs is mandatory for the biodiversity conservation and needs further efforts by local authorities and government. In addition, Türkiye is far from reaching the AICHI targets and 30x30 Kunming-Montreal Global Biodiversity Framework for the moment. In 2022, 23 targets were set for 2030. Among them, Target 3 was colloquially known as 30x30, due to the sole effective protection and management of 30% of world coastal and marine areas, which includes both inland and terrestrial ecosystems as well. Over 195 countries, including Türkiye, are committed for achieving this goal by 2030. These goals are surely ambitious, but it is an urgent solution against biodiversity and climate crisis. Kunming-Montreal Global Biodiversity Framework calls for at least 30% of marine areas to be protected by 2030. While global efforts are increasing, more needs to be done to get closer to this target, including EU countries (UNEP-WCMC and IUCN (2024).

Conclusion

Well-governed and effectively managed protected areas are known to be a proven method for safeguarding both habitats and populations of vulnerable species. Particular emphasis is needed to protect critical ecosystems such as seagrass meadows, coralligenous communities, dark habitats and coastal wetlands. Moreover, there is a necessity to focus attention to the representability, connectivity, and effectiveness of management of protected areas in Turkish waters. Türkiye is party of the Convention of Biological Diversity and of the international commitment. Therefore, it is expected to contribute more to protected areas in the near future. As a result, Türkiye, which possesses the longest coastline in the Mediterranean Sea, is obviously expected to take responsibility for the protection of this vulnerable sea. Transboundary collaboration becomes particularly important in designating MPAs networks. Promoting regional/bilateral cooperation on marine/coastal species/habitats protection is also an important mechanism in the establishment of transboundary MPAs in the Aegean and Mediterranean Seas. These initiatives are crucial for the conservation of highly migratory species such as cetaceans, sharks, sea birds, some fish species and sea turtles. Turkish waters are under tremendous anthropogenic pressures, which are non-negligible. Therefore, SEPAs are expected to constitute one of the main tools for the biodiversity protection against those pressures. The invasion of non-indigenous species, which is related to the

warming of the sea water, is an essential factor that will continue to change the marine biodiversity of the Turkish seas. Consequently, SEPAs will gain more importance as effective *in situ* protection measures. In line with global biological diversity goals, the world's governments continue their efforts to increase the number of protected areas and MPAs. Protected areas should be determined in the most important places for high interconnectivity and biodiversity. Targets have been set to protect and integrate 30% of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, into wider landscapes and seascapes through effectively and equitably managed, ecologically representative, and well-connected protected area systems and other effective area-based conservation measures by 2030. To achieve this 2030 target, Türkiye needs more MPAs covering all Turkish waters, especially in the Black Sea.

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Türkiye'deki Özel Çevre Koruma Bölgelerine genel bir bakış, hedefler ve bazı öneriler

Öz

Özel Çevre Koruma Bölgeleri (ÖÇKB), Türkiye'deki başlıca deniz koruma alanlarıdır (DKA). Türkiye'de şu ana kadar kara ve deniz bölgelerinde olmak üzere toplam 19 ÖÇKB bulunur. Bunlardan 13 tanesi 1988-2025 yılları arasında ilan edildi. Küresel hedefler ve uluslararası taahhütler doğrultusunda, Türkiye'deki ÖÇKB ve diğer korunan alanlar, konumlarına, büyüklüklerine, kategorilerine, kaynak değerlerine vb. göre CBS tabanlı mekânsal analiz yöntemleri kullanılarak analiz edildi. Finike Denizaltı Dağları hariç her denizel ÖÇKB'nin kendine ait karasal ve denizel kısmı bulunmaktadır. En büyük ÖÇKB, Barselona Sözleşmesi çerçevesinin coğrafi kapsamının dışında kalan 12.246,16 km^2 ile Marmara Denizi ve Adalarıdır. En küçük ÖÇKB ise 141,68 km^2 ile Belek'tir. En son belirlenen ve 2021 yılında ilan edilen Marmara Denizi ve adalarını içeren ÖÇKB sınırları 2024 yılında genişletilmiştir. Finike Denizaltı Dağları, Kaş-Kekova ve Datça-Bozburun ÖÇKB'leri sınır aşan niteliktedir. Karadeniz'de şimdilik herhangi bir ÖÇKB bulunmamaktadır. Bu nedenle, Karadeniz'in deniz biyoçeşitliliğini korumak için ÖÇKB'lerin acilen belirlenmesi tavsiye edilmektedir. Bu çalışma sonucunda Türkiye'nin kıyı ve deniz sularının sadece %6.22'si korunan alan olarak hesaplanmış olup, bunların %5.71'i mevcut ÖÇKB'lerdir. Bu haliyle, Türkiye AICHI Hedefi 11 ve Kunming-Montreal Küresel biyoçeşitlilik çerçevesi hedeflerinin dışında bulunmaktadır. Önerimiz, esas olarak Karadeniz ve Doğu Akdeniz'de AICHI Hedeflerine ve 30x30

Küresel Biyoçeşitlilik koruma taahhüdünü yerine getirmek için yeni ÖÇKB'lerin ilan edilmesidir. Böylece; Türkiye'nin taahhüt ettiği hedeflere ulaşmak kolaylaşabilir.

Anahtar kelimeler: Türkiye, denizel biyolojik çeşitlilik, Özel Çevre Koruma Bölgesi, AICHI Hedefleri, Kunming-Montreal

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