Putting PEEN to Practice in Marine and Coastal Areas
A demonstration project ensuring the ecological resilience, coherence and sustainable future of Gökova Bay SEPA in Turkey

FINAL REPORT

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ACTIVITY 1.1 BIODIVERSITY VALUES IDENTIFIED AND ASSESSED

1.1.1 Classification of coastal habitats

Cem Orkun Kıraç and Semiha Demirbaş Çağlayan had executed field studies of this component. Gökhan Kaboğlu assisted the conversion of the analog data into GIS. Totally 7 days of field studies (ANNEX 1) covered. Complete coast line is surveyed using a speed boat. The classification of the coast line was recorded with a GPS and then all coordinates were exported to GIS media. The classification based on the Standard Data Entry Form which is developed in The Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean and the Action Plan for the Protection of the Marine Environment and the Sustainable Development of the Coastal Areas of the Mediterranean (MAP Phase II), adopted by the Contracting Parties to the Barcelona Convention in 1995. In the classification of the coastal habitats in Gökova, following categories are agreed upon; coastal wetlands, salt marshes, sand dunes, sand and shingle beaches, sea cliffs and rocky shores beside that the vegetation is classified considering the bio-variation of the Mediterranean region. These classes are modified in a matrix table with the aim of the field study regarding the characteristic vegetation types of Gökova Bay (Table 1).

Table 1 Coastal zone habitat classes. * Trees + Olive trees + Scrubs,** Olive trees + Scrubs, *** Trees + scrubs

	Coastal wetlands			**Salt marshes**	**Beaches**		**Rocky coasts**		**Agricultural lands**	**Other lands**
	Lagoons	Estuaries	Deltas		Sand beach	Shingle beach	Sea cliff	Rocky Shores		
No vegetation										
Scrub, Maquis, Garrigue, Phrygana										
Forests										
Olive Grove										
Mixed 1*										
Mixed 2**										
Mixed 3***										

According to the field studies the general characteristics of the coastline is composed of rocky shores. The length (km.) versus habitat types is graphed in Figure 1.

Also *Erygium thorifolium*, an endemic flora species for Gökova, Datça and Sandras Mountains region was determined in field survey by the support of Botanist Assoc. Prof. Cenk Durmuş Kahya ın taxa identification. High maquis strands which are composed of sandalwoods, gum trees, *Quercus coccifera* etc. are also important for Gökova Bay SEPA (ANNEX 2).

The area is mainly composed of untouched areas with natural vegetation. 8% of the coastal areas are under direct influence by human activities in terms of manmade structures (human settlements, hotels, coastal facilities such as piers, docks and roads) (Figure 2).

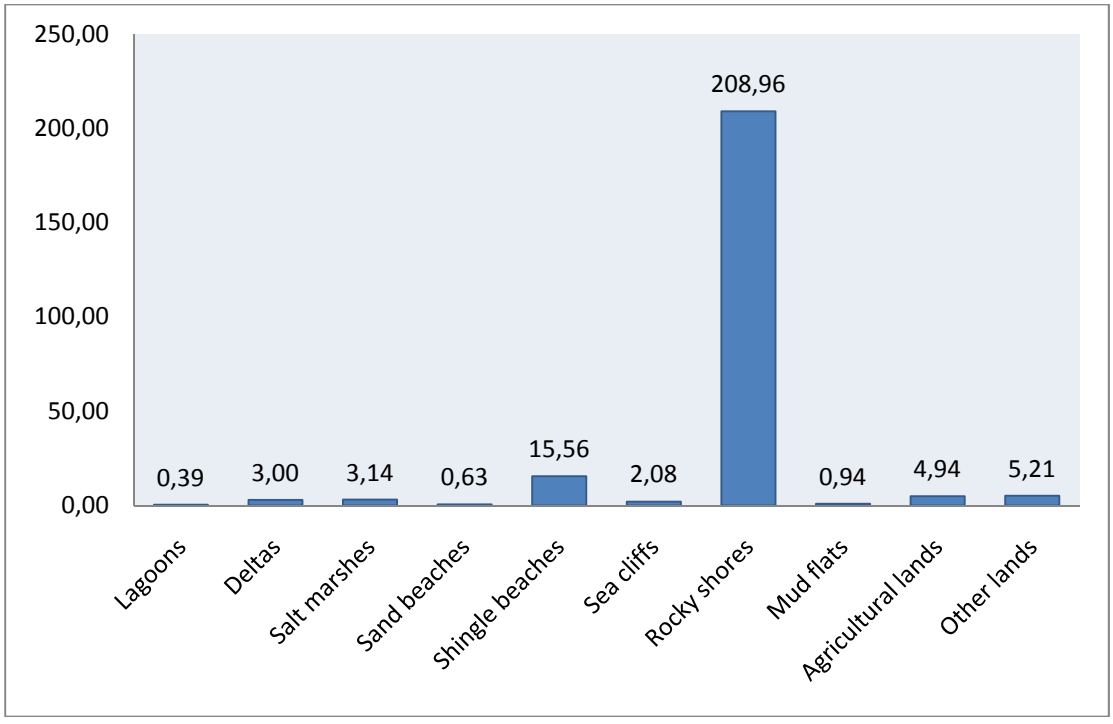

Figure 1 Coastal habitat types and their length (km) within Gökova SEPA. * Total coastal length is 272 km.

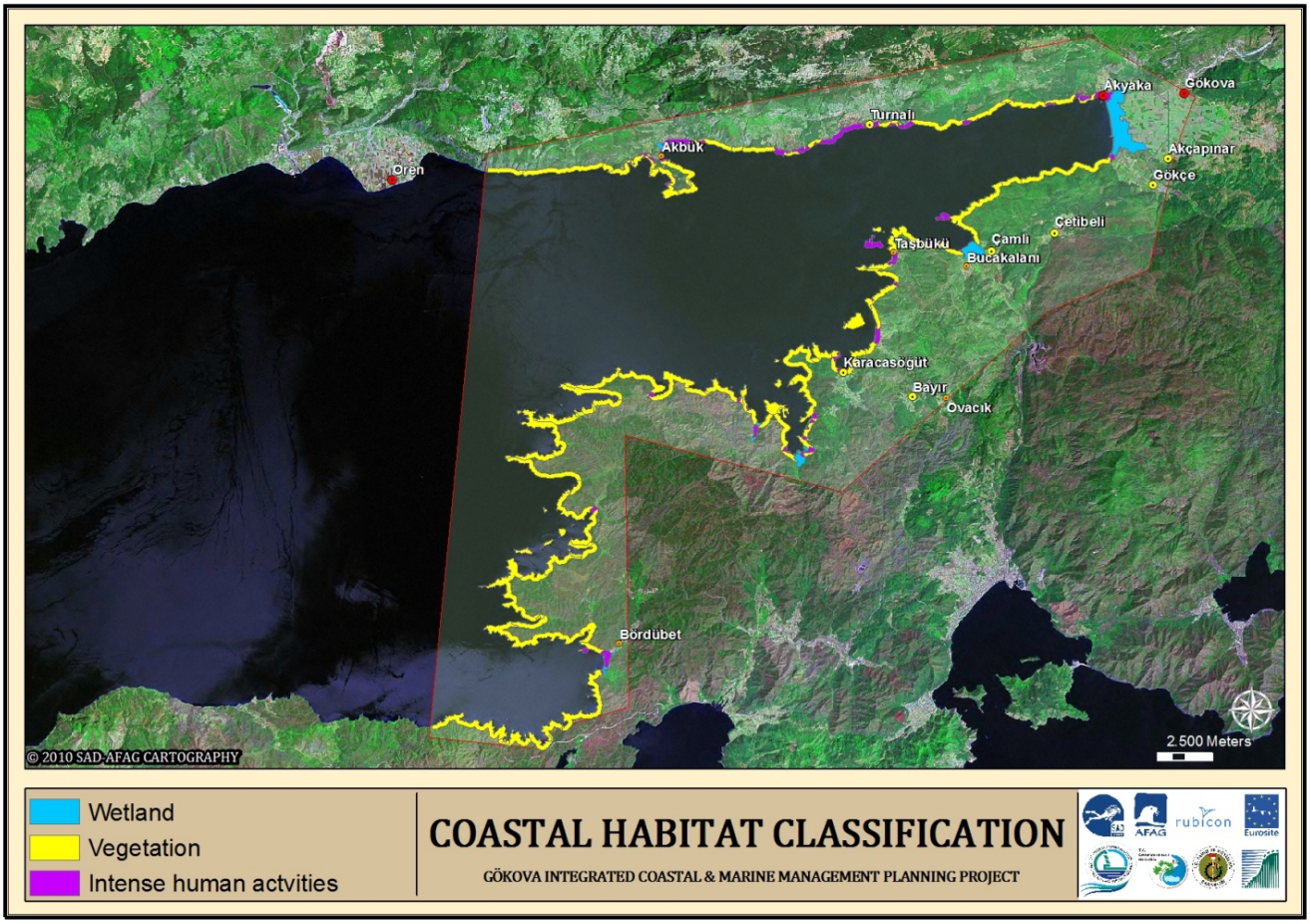

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Figure 2 Map of coastal habitats

1.1.2 Posidonia beds distribution

The component consultant Yalçın Savaş primarily studied existing literature and then he completed field studies in 18 days (ANNEX 3).

In order to provide a *Posidonia* beds distribution map of the project area, considering the limited survey time and finance for a more comprehensive field research due to the huge size of the study area, in this project it is decided to use the data in the previous reports of Gökova and perform field studies in selected areas, and synthesis all information/data in GIS. Posidonia beds which are located between 0 and 30 m deep are mapped at the following coasts (Figure 3);

- Northern costs of the Gokova SEPA,
- Boncuk Bay,

- Yediadalar; the four southern islands and adjacent coasts of Gokagac Limani, Karagac Limani, Sakli Cove, Kufre Cove.
- Bordubet Limani, between Mersincik Burnu at the north and Gokova SEPA border at the south.

Sea grass meadows are discovered and species are identified through a close-circuitv. Underwater camera is towed behind the boat in very low speeds between 3 to 5 nautical miles in order to keep ascent of the camera minimum. Length of camera cable is adjusted by hand so that a meaningful view of the sea bottom appears on tv monitor. Boat is steered in zig-zags over the beds and once a margin noticed on tv monitor the towed camera dropped on the bottom and the boat is handled in order to make the camera cable straight. While bed margin is seen through the close-circuit tv, GPS coordinates are fixed and depth is read from "fish finder". In areas where Posidonia shows a patchy distribution, big gaps are measured and showed as *posidonia-free zones* but smaller gaps are considered within the covered area. In order to determine the deep limits of Posidonia beds, regardless of the coverage, deepest existence of living shoots are searched and taken as a basis for a deepest limit. Since posidonia is always getting looser by depth.

All data is recorded on paper forms in the following fields;

- file name in GPS,
- point number in GPS,
- dept from "fish-finder" and
- type of margin as deep-shallow-side.
- Mostly deep side limits of *Posidonia* beds are researched in order to complete the study within allocated time. Some points at shallow limits are also recorded as reference and shallow limits of the beds are drawn by using the satellite image and the reference points recorded in the field.

It is noticed that without bathymetric information, it is impossible to enter previous data in GIS, map to be drawn will lose its meaning without isobaths and needed bathymetric data in digital

medium is not available. For these reasons, it is decided to generate needed bathymetric data by field research. -10 and -30 meter isobaths are targeted to be determined, considering time and finance limitations for a full bathymetric mapping. -10 meter is selected to draw shallow margins of *Posidonia* distribution, which exist between 0 and -10 meters in general, and -30 meter is selected to draw deep margins that are mostly found from -20 to -40 meters.

Mostly deep and side limits of Posidonia beds are researched in order to complete the study within allocated time. Some points at shallow limits are also recorded as reference and shallow limits of the beds are drawn by using the satellite image and the reference points recorded in the field.

Bathymetric studies are performed at all coats and known shoals of Gökova SEPA and done by recording points at shallower (upper) limits of -10m and -30m by GPS while a fishing boat equipped with a fish-finder is steered in zigzags along the cost and around the shoals (Figure 4).

Following values are calculated by GIS on the map drawn (Coasts at the North / North-west of Gökova settlement are called northern coasts and the coasts at the South / South-west of Gökova settlement are called southern coasts):

- Total area of Posidonia beds : 13.005.918 m^2
- Area of the beds at North : 989.351 m^2
- Area of the beds at South : 12.016.567 m^2

In this respect, 92,4 % of the Posidonia distribution in Gökova SEPA exist at the southern coasts of the area.

- Posidonia beds existence at the coasts of SEPA: 67%
- Posidonia beds existence at northern coasts: 29% (14.695m coastline having Posidonia beds at 50.582m in total).
- Posidonia beds existence at southern coasts: 77% (144.218m coastline having Posidonia beds at 188.120m in total).

Greatest posidonia bed widths:

- about 1.030 meters at Bördübet Limani
- about 420 meters at Yediadalar Islands

According to field studies performed in this project Posidonia shallow limit exists at -1 to -21 m depths and along a coastal band from 0 to 420 m distance from the shore. Deepest distributions are found at

- Yediadalar Islands (-36m / -37m),
- Around Mersincik Cape (-38m, northern entrance of Bordubet Limani),
- Bordubet Limani (-36m, between Amazon and Mersincik Cape),
- Gerence Cape (-37m, west of Bordubet Limani, between Cati cove and SEPA border).

The relevant technical final report of the consultant is attached by ANNEX-4.

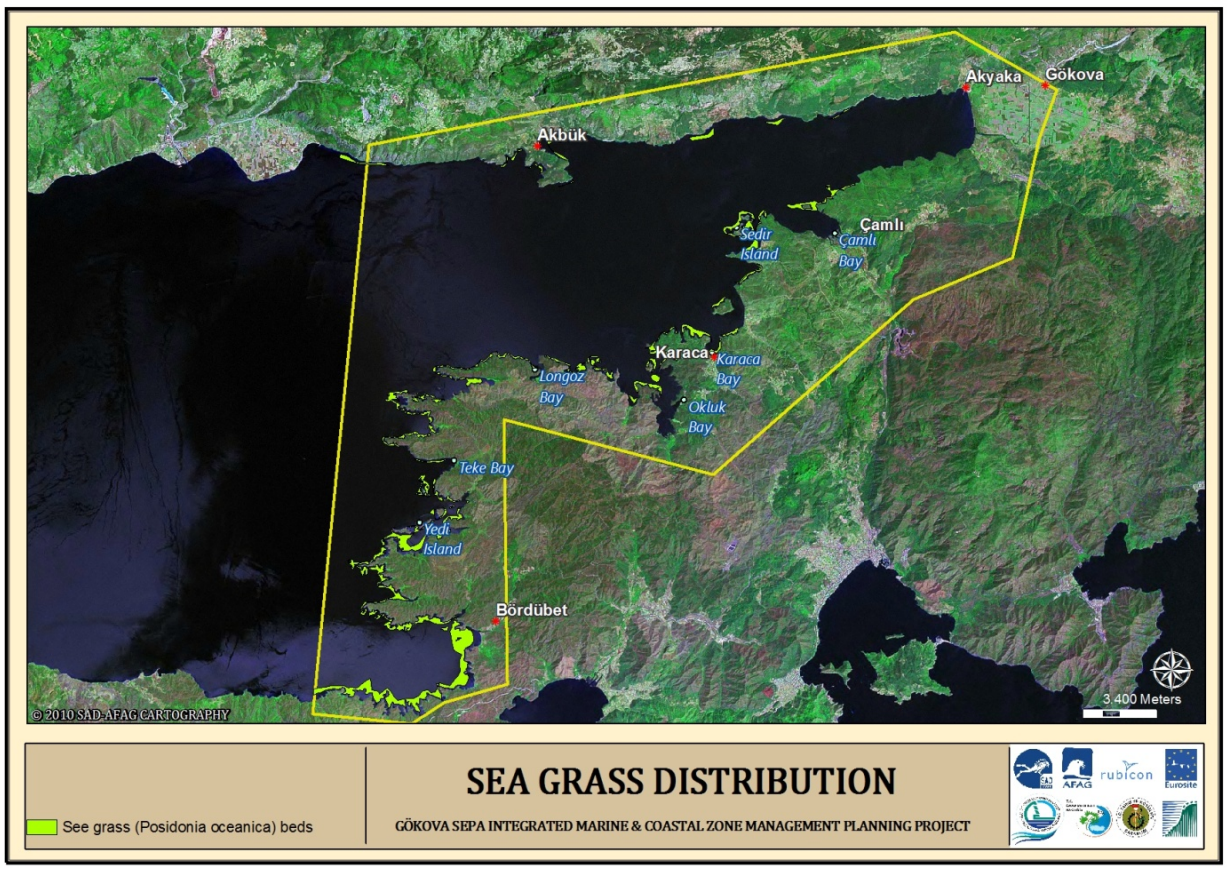

Figure 3 Map of sea grass meadow distribution

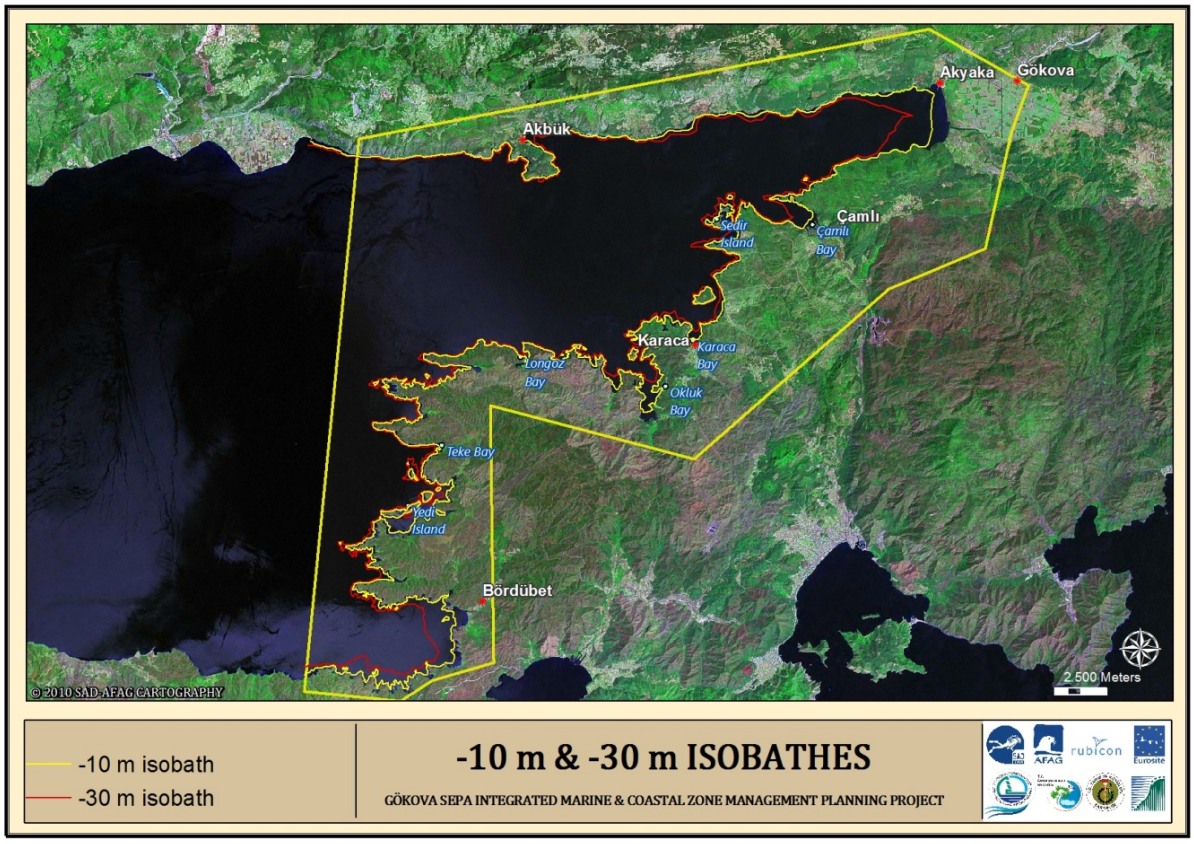

Figure 4 Map of -10 and -30 m. isobaths

1.1.3 Macrozoobenthic Fauna Survey

The component consultant Assoc. Prof. Murat Bilecenoğlu primarily completed the literature survey and provided the results in the 1st Report on Gökova Macrozoobenthic Fauna (ANNEX 5) and then he conducted field studies at seven different stations namely Akbük, Turnalı, Kandilli, Çınar beach, Boncuk Bay, Karacasöğüt and Bördübet (Figure 5) where a total of 86 macrozoobenthic species belonging to nine major taxonomical groups were identified (ANNEX 6). Skin dives were made at depths ranging 0 to 5 m and each species identified were noted to PVC plates under the water. A small sample of individuals (fixed in 4% formalin) was taken for species those requiring detailed analysis for precise species identification back in the laboratory. Molluscans had the highest number of species (37 sp.), followed by Porifera (13 sp.), Crustacea (10 sp.), Cnidaria (9 sp.), Echinodermata (7 sp.), Annelida (5 sp.), Bryozoa (2 sp.), Tunicata (2 sp.) and Echiura (1 sp.).

The richest species diversity was observed in Boncuk Cove, whereas Bördübet represented the lowest number of species. Çinar beach and Kandilli shores had the highest faunal similarity with a score of 52.6%, while rests of the sampling stations were generally dissimilar. Considering the analysis of species richness (Shannon-Wiener diversity index), Boncuk Bay and Bördübet ranked the first and last place, respectively. A checklist of zoobenthic species hitherto recorded from Gökova Bay is also presented, based on results of the previously published literature. The review study revealed the presence of 905 species inhabiting the region. There are 23 threatened macrozoobenthos species identified in Gökova SEPA according to appendices of Barcelona and Bern conventions (Table 2).

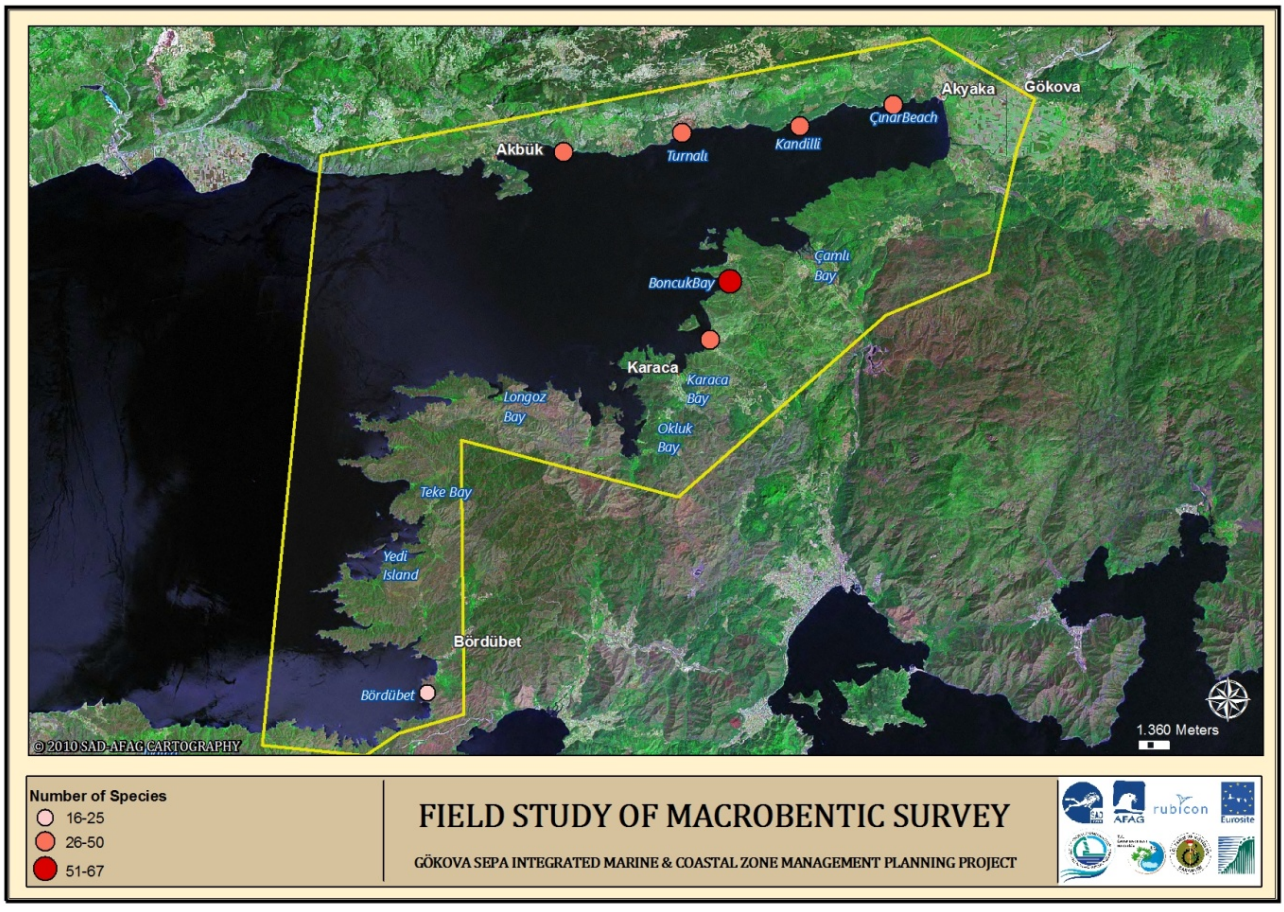

Figure 5 Field study of macrozoobenthic survey

Table 2 Threatened zoobenthic species of Gökova Bay according to Barcelona (1996) and Bern (2002) conventions.

Species	Barcelona	Bern
Aplysina aerophoba Nardo, 1843	Annex II	-
Axinella cannabina (Esper, 1794)	Annex II	-
Axinella polypoides Schmidt, 1862	Annex II	Annex II
Centrostephanus longispinus (Philippi, 1845)	Annex II	Annex II
Charonia variegata (Lamarck, 1816)	Annex II	Annex II
Hippospongia communis (Lamarck, 1814)	Annex III	Annex III
Homarus gammarus (Linnaeus, 1758)	Annex III	Annex III
Hornera cf. *lichenoides* (Linnaeus, 1758)	Annex II	-
Lithophaga lithophaga (Linnaeus, 1758)	Annex II	Annex II
Luria lurida (Linnaeus, 1758)	Annex II	Annex II
Maja squinado (Herbst, 1788)	Annex III	Annex III
Mitra zonata Marryatt, 1817	Annex II	Annex II
Palinurus elephas (Fabricius, 1787)	Annex III	Annex III
Paracentrotus lividus (Lamarck, 1816)	Annex III	Annex III
Pholas dactylus Linnaeus, 1758	Annex II	Annex II
Pinna nobilis Linnaeus, 1758	Annex II	-
Pinna rudis Linnaeus, 1758	Annex II	Annex II
Scyllarides latus (Latreille, 1803)	Annex III	Annex III
Scyllarus arctus (Linnaeus, 1758)	Annex III	Annex III
Spongia agaricina Pallas, 1766	Annex III	Annex III
Spongia officinalis Linnaeus, 1759	Annex III	Annex III
Spongia zimocca Schmidt, 1862	Annex III	Annex III
Tonna galea (Linnaeus, 1758)	Annex II	Annex II

During the field works (ANNEX 7), six threatened species were identified, namely *A.aerophoba* (Porifera), *L.lithophaga*, *P.nobilis* (Mollusca; Figure 6), *P.lividus* (Echinodermata), *S.latus* (Crustacea; Figure 7) and *T.galea* (Mollusca). None of these species, except for the sea urchin *P.lividus* and gold sponge *A.aerophoba*, were abundant and represented locally by a few number of individuals.

Both previous studies by Okus et al. (2006) and our recent diving observations pointed out that, none of the alien zoobenthic organisms have established large populations throughout the study area. The non native echinoderm *Synaptula reciprocans* is an exception, which is currently widespread in Gökova Bay but clearly with low biomass values. Due to lack of concrete data, it is not possible at the moment to comment on any possible negative impacts of alien invertebrates to the local ecosystem. It is strongly advised to carry out monitoring projects exclusively related to construction of an alien species database of Gökova Bay, determination of biomass values of existing species and their ecological roles in the future projects.

As with most parts of the Aegean and Mediterranean Sea, fishermen of Gökova Bay have a few target benthic invertebrates mainly including crustaceans (shrimps, prawns etc.) and molluscans (squid, cuttlefish, octopus etc.).

The relevant technical final report of the consultant is attached by ANNEX-8.

1.1.4 Fish Biodiversity Survey

The component consultant Assoc. Prof. Murat Bilecenoğlu completed first literature survey and provided the survey findings in the 1st Report on Fish Biodiversity of Gökova SEPA (ANNEX 9) and then the field studies were carried out at eight stations namely Çınar, Boncuk Cove, Karaca, Akbük, Turnalı, Kandilli and Bördübet, selected within the Gökova Bay Specially Environmental Protection Area. The study focused on direct observation (rapid visual censuses) of fishes during skin dives which were limited to period of one hour at depths ranging 0 to 5 m (ANNEX 10).

Diving observations revealed the presence of a total of 71 fish species belonging to 31 families throughout the study localities (ANNEX 11). In terms of species diversity, Boncuk Cove had the highest number of fish species (52 sp.), followed by Karaca (38 sp.). Lowest number of species was determined at Bördübet. The similarity analysis performed indicated that, study localities are clustered under three groups (at 50% similarity level; Bördübet and Turnali forms two distinct groups, while the rest stations took place in another group).

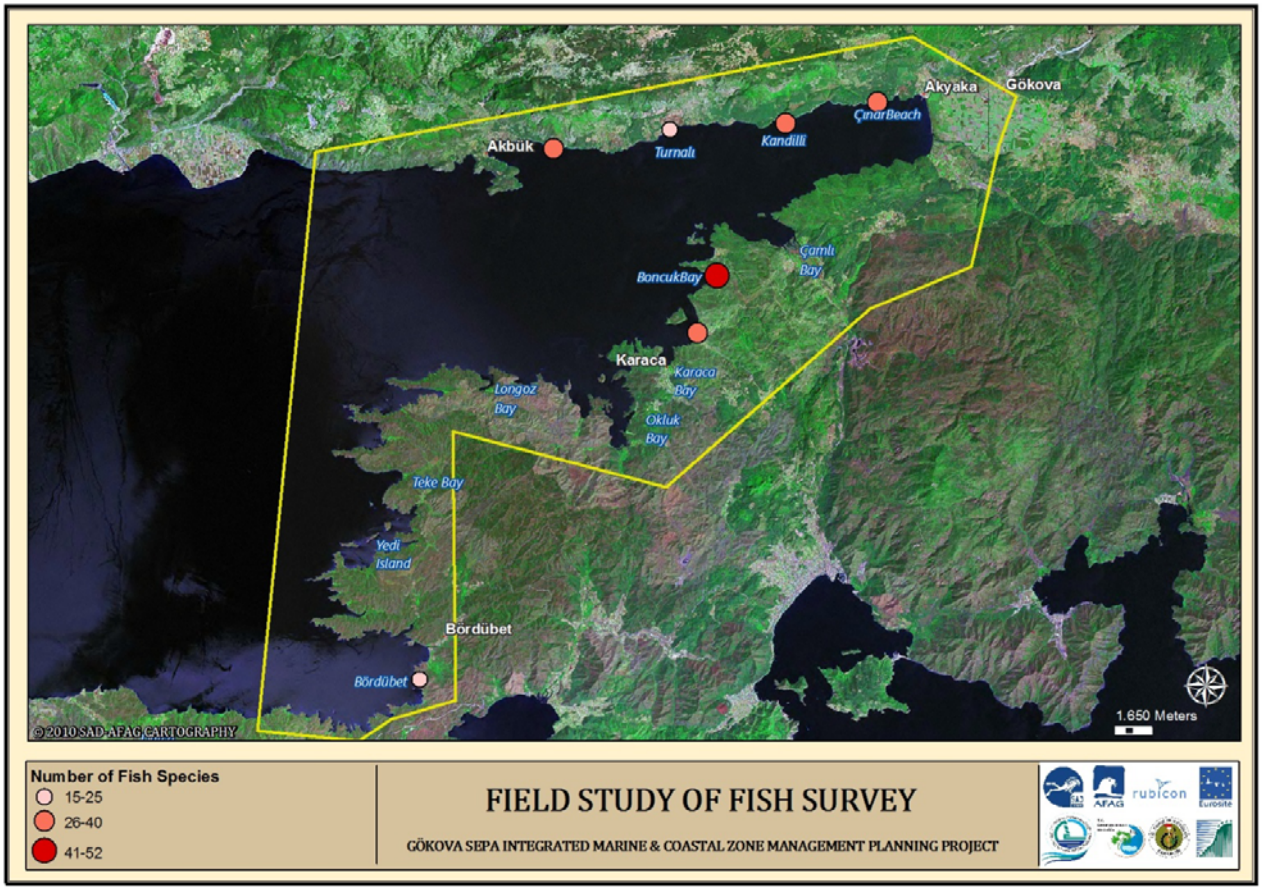

Figure 6 Field study of fish survey

Six species were present at all diving localities, which are known to have a common distribution along the entire Aegean Sea coasts, namely: damselfish (*Chromis chromis*), Mediterranean rainbow wrasse (*Coris julis*), two banded sea bream (*Diplodus vulgaris*), gray mullet (*Liza* sp.), painted comber (*Serranus scriba*), and silver cheeked toadfish (*Lagocephalus sceleratus*).

According to the results of similarity analysis, Kandilli and Çınar beach shared the highest number of species in common, thus representing a similarity value of 69.2 %. Most distant stations were Boncuk Bay and Turnalı, which were just 44.6% similar in terms of species diversity and their abundances.

The American Fisheries Society (AFS) has suggested values for several biological parameters that allow classifying a fish population or species into categories of “high, medium, low and very low resilience” or productivity (Musick 1999). Analysis of the resilience of fishes revealed that, majority of the species (91 % of total) fall into categories of high and medium resilience (Figure 4). These species are characterized by their fast (or moderately fast) growth

performance, with relatively short life spans of up to 10 years. Such fish are highly tolerant to anthropogenic impacts, which describe their already abundant distribution along the shallow coasts where several disturbance factors exist.

The proportion of fishes with low and very low resilience were quite small; including the following species: *Bothus podas* (Low), *Epinephelus marginatus* (Low), *Dentex dentex* (Low), *Carcharhinus plumbeus* (Very Low), *Dasyatis pastinaca* (Very Low) and *Lagocephalus sceleratus* (Very Low). Due to their biological characteristics (i.e. low fecundity, long life span, slower growth), these fishes are vulnerable to all kinds of fishery activities and some of them are listed as threatened by IUCN Red List and Bern Convention. In most cases, low or very low resilient fishes are formed of those under significant threat of extinction.

The alien pufferfish (*L.sceleratus*) is an exception, which seems to be very abundant throughout the Gökova Bay SEPA despite of its "very low" resilience. This contradictory fact maybe due to the existence of unsaturated niches found at the study area, lack of predators and banned fisheries of the species because of its highly toxic nature.

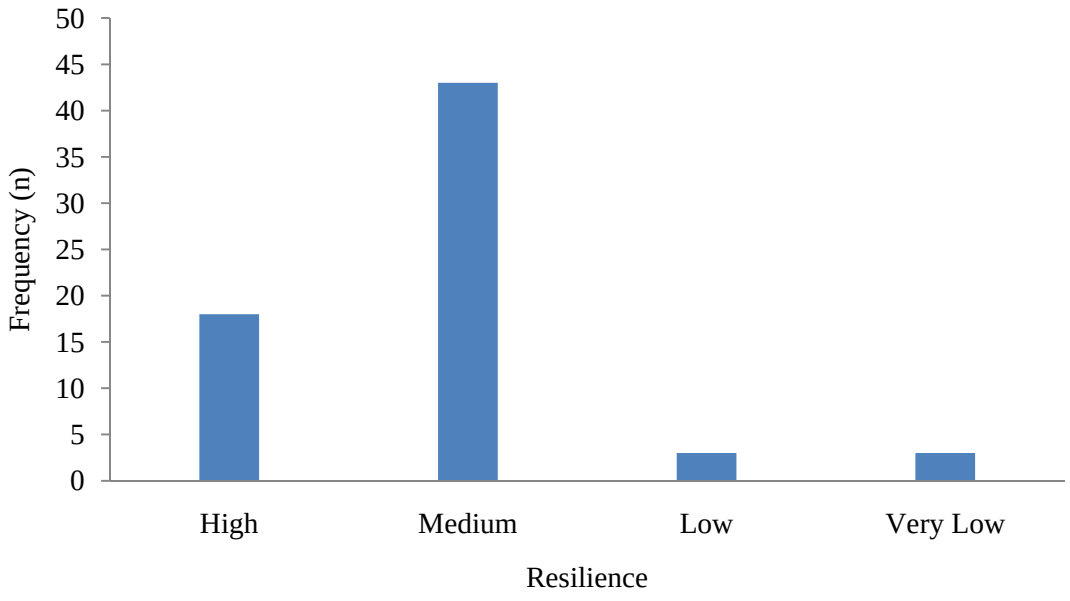

Figure 7 Resilience of fishes

The literature survey revealed the presence of 352 fish species in the area, which comprises almost 73% of all fishes known from Turkey. Local ichthyofauna is more diverse than expected, especially considering the oligotrophic nature of Gökova Bay. Majority of the species are Atlanto-Mediterranean originated (as is the case for the entire Mediterranean basin), followed by cosmopolitan species, Mediterranean endemics and non-native fishes. There are 24 species under the threat categories (CR, EN, VU) of IUCN global red list and 17 species under the annexes of Bern Convention (Table 3).

Table 3 List of marine fish species reported from Gökova Bay, including their status in global red list of IUCN. Abbreviations as follows, A-M: Atlanto-Mediterranean, C: Cosmopolitan, M: endemic to the Mediterranean, R: alien (non-native) species.

Family	Species	Origin	IUCN Red List	Bern Convention
Hexanchidae	*Heptranchias perlo*	C	Near Threatened	
Hexanchidae	*Hexanchus griseus*	C	Near Threatened	
Odontaspididae	*Carcharias taurus*	C	Vulnerable A2ab+3d	
Odontaspididae	*Odontaspis ferox*	C	Vulnerable A2bd+4bd	
Lamnidae	*Carcharodon carcharias*	C	Vulnerable A2cd+3cd	Annex II
			Vulnerable	Annex III
Lamnidae	*Isurus oxyrinchus*	C	A2abd+3bd+4abd	
Lamnidae	*Lamna nasus*	C	Vulnerable A2bd+3d+4bd	Annex III
Cetorhinidae	*Cetorhinus maximus*	A-M	Vulnerable A2ad+3d	Annex II
			Vulnerable	
Alopiidae	*Alopias vulpinus*	C	A2bd+3bd+4bd	
Scyliorhinidae	*Galeus melastomus*	A-M	Least Concern	
Scyliorhinidae	*Scyliorhinus canicula*	A-M	Least Concern	
Scyliorhinidae	*Scyliorhinus stellaris*	A-M	Near Threatened	
Triakidae	*Galeorhinus galeus*	C	Vulnerable A2bd+3d+4bd	
Triakidae	*Mustelus asterias*	A-M	Least Concern	
			Vulnerable	
Triakidae	*Mustelus mustelus*	A-M	A2bd+3bd+4bd	
Carcharhinidae	*Carcharhinus plumbeus*	C	Vulnerable A2bd+4bd	
Carcharhinidae	*Prionace glauca*	C		Annex III
Dalatiidae	*Etmopterus spinax*	A-M	Least Concern	
Dalatiidae	*Oxynotus centrina*	A-M	Vulnerable A2bcd+4bd	
Dalatiidae	*Dalatias licha*	C	Near Threatened	
Centrophoridae	*Centrophorus granulosus*	A-M	Vulnerable A2abd+3d+4d	
			Vulnerable	
Squalidae	*Squalus acanthias*	C	A2bd+3bd+4bd	
			Critically Endangered	
Squatinidae	*Squatina aculeata*	A-M	A2bcd+3cd+4cd	
			Critically Endangered	
Squatinidae	*Squatina oculata*	A-M	A2bcd+3cd+4bcd	

			Critically Endangered	Annex III
Squatinidae	*Squatina squatina*	A-M	A2bcd+3d+4bcd	
Rhinobatidae	*Rhinobatos cemiculus*	A-M	Endangered A4bd	
Rhinobatidae	*Rhinobatos rhinobatos*	A-M	Endangered A4cd	
Rajidae	*Leucoraja naevus*	A-M	Least Concern	
Rajidae	*Raja asterias*	M	Least Concern	
Rajidae	*Raja clavata*	C	Near Threatened	
Rajidae	*Raja miraletus*	C	Least Concern	
Rajidae	*Raja undulata*	A-M	Endangered A2bd+3d+4bd	
Rajidae	*Rostroraja alba*	A-M	Endangered A2cd+4cd	Annex III
Dasyatidae	*Dasyatis centroura*	A-M	Least Concern	
Gymnuridae	*Gymnura altavela*	A-M	Vulnerable A2bd+4bd	
Myliobatidae	*Rhinoptera marginata*	A-M	Near Threatened	
Myliobatidae	*Mobula mobular*	A-M	Endangered A4d	Annex II
Chimaeridae	*Chimaera monstrosa*	A-M	Near Threatened	

Apart from fish biodiversity studies special emphasize was given to determine recent status of endangered sandbar sharks (*Carcharhinus plumbeus*) in Boncuk Cove. Sandbar sharks were observed during April, May and June 2009 (totally 20 days of field work) in Boncuk Bay, where a total of 127 individuals were determined during skin divings. All sharks were larger than 150 cm, indicating that mature individuals dominate the locality (ANNEX 12).

Regarding their zoogeographical origins, 88.7% of the species determined during the dives were native (either Atlanto-Mediterranean originated, endemic to the Mediterranean or have cosmopolitan distribution), while the rest (8 species) are alien organisms with Indo-Pacific origin.

Most abundant species were the marbled spinefoot (*Siganus rivulatus*) and hardyhead silverside (*Atherinomorus lacunosus*), which both form small schools at shallow shores. Specific scientific research made along the Mediterranean coast to date was unable to point out any negative impact of alien fish, with respect to their interactions with other species (predator/prey). There are some concrete data that the local fishermen capture a couple of alien fish as a target species (such as goatfishes – Upeneus spp., brushtooth lizardfish – *Saurida undosquamis*, etc.), and some seasonal by-catch are also commercially evaluated (i.e. Spanish mackerel – *Scomberomorus commerson*).

The alien pufferfish, *Lagocephalus sceleratus*, can be regarded as one of the "worst alien fishes" of the entire Mediterranean Sea; harmful to both human health and fishing gears (Bilecenoglu, 2010). It is currently the most common and abundant pufferfish all through Turkish coasts, which is a dangerous species due to lethal toxin in its flesh. Several local fishermen reported its harmful effects to fishing gears (such as bottom longlines), but majority seems to be unaware of the toxic features of the species; some even tried to cook it. It is vital to conduct a public awareness study within the SEPA, regarding all alien pufferfishes.

At certain periods of the year, sandbar sharks regularly come to Boncuk Cove for breeding and the region has attracted international interest, since it is one of the well-known nursery grounds of the species around the world. Unfortunately, the local people around the region could not recognize the uniqueness of these sharks, which are threatened by artisanal fishery activities, amateur fisheries and oily waste waters released by various kinds of boats.

The relevant technical final report of the consultant is attached by ANNEX-13.

1.1.5 Avifauna survey

The component consultant Cem O. Kıraç and researcher biologist Kasım Kırlangıç have conducted field studies on birds in total 21 days covering both spring & autumn migration periods and winter and summer seasons (ANNEX 14). The previous birding records are also obtained from Bahar Suseven and Dr. Max Kasparek who has previous bird records in the field.

Avifauna survey marine route coverage within Gökova SEPA is 100%. Territorial bird observations have been made on the selected spots shown in the grids given in the Figure 8.

Both line transect and spot count methods were applied for observing and counting birds. Majority of the birds were photographed using telephoto lenses. 10x50 and 12x25 binoculars as well as spotting scope with 20-60x ocular were used for bird observations. Canon 1DMarkIII body and Canon 300 mm f4 IS L lens and Canon 1.4X II extender were used for bird photography. Also different cameras with wide angle lenses were used for landscape and habitat photography. Landscape, bird count locations and important breeding habitats were

photographed in each bird survey. Some of birds are given in the photo gallery of the project web site http://www.sadafag.org/gokova/index.php?bolum=galeriler&kategori=18

Stations were selected within Gökova SEPA to conduct spot counts. The spot count locations are as follows;

1- Akyaka town
2- Gökova plain
3- Çamlı
4- Karaca
5- Bördübet
6- Amazon
7- Akbük village
8- Turnalı village
9- Çınar beach

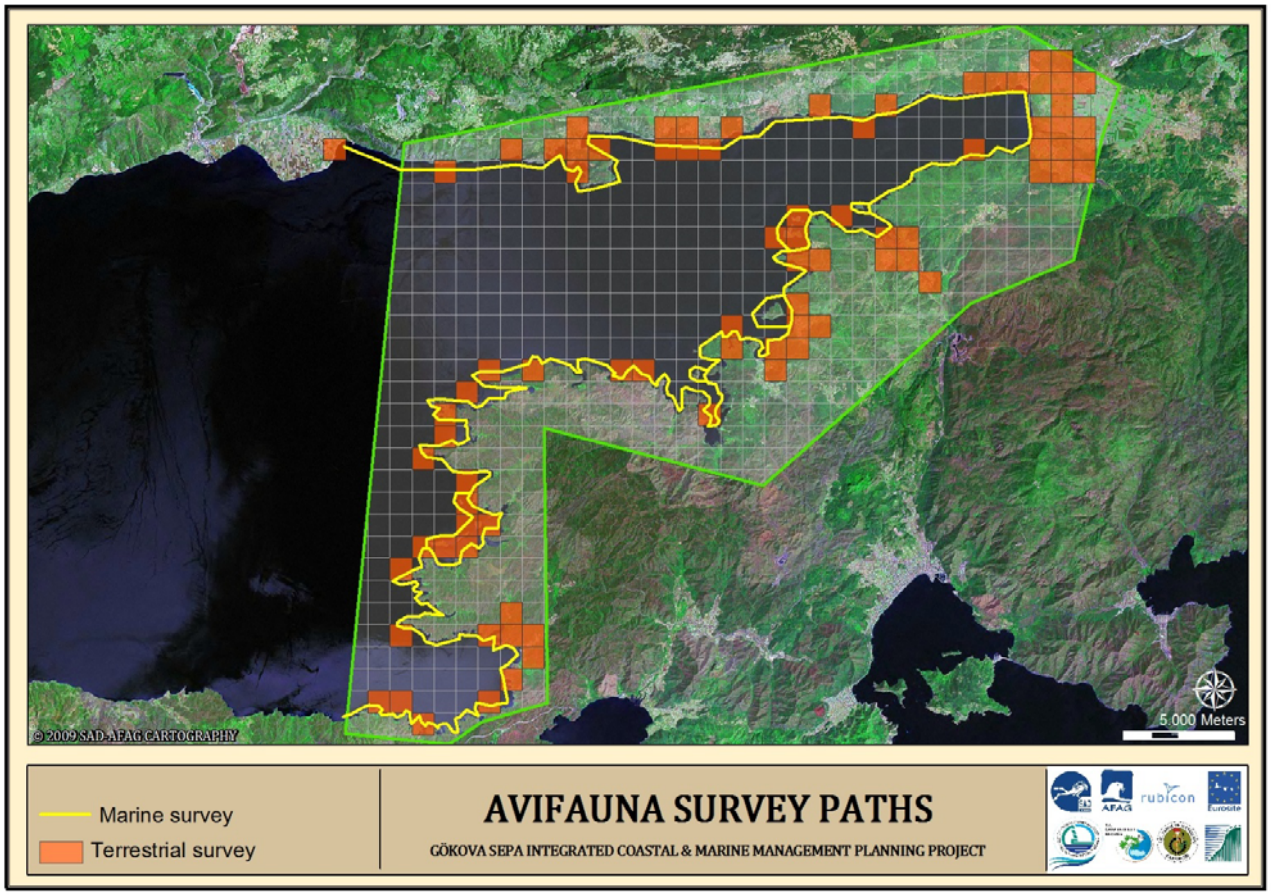

Figure 8 Avifauna survey paths indicating both marine and territorial.

As a result of the field studies during the project term and literature study, 142 bird species were identified within Gökova SEPA. 123 bird species were identified during the field studies held between May 2009 and October 2010 arranged within this project. The literature data were obtained mainly from Bahar Suseven, local biodiversity consultant, and also Dr. Max Kasparek who has previous observation records in and around Akyaka. The full list of birds of Gökova SEPA is given in ANNEX 15.

In accordance with the field studies the most important bird areas are;

1- Gökova wetland & plain (including the dunes along coast)(Grids AG4, AG5, AG6, AH4, AH5, AH6)
2- Çamlı wetland and delta
3- Karaca
4- Bördübet
5- Amazon
6- Coasts around Gökova SEPA southern border
7- Akbük wetland
8- All islands within Gökova SEPA
9- The coastal zones in Grids D7, E7, F7, G7, H7, I7, J7, K7, R7, Z5, Y6, AG4, X10, V15, U16, S15, S16, N17, J17, F19, F20, E21, H24, F25, D26, D29, I31, H32, D32, C32 (for Shags)

The maximum number of bird species has been recorded in the wetland and coastal zone in Gökova wetland & plain (including dunes along the coast) (Figure 9). Especially the southern part of Gökova wetland (southern zone of the artificial landfill jetty) is the richest and at the same time the most sensitive zone in whole Gökova SEPA. The empty grids within Gökova wetland & plain do not refer to “no birds”. Due to time and budget constraints, 87% of this area has been studied in detail while 13% (only two grids) was not searched. Unfortunately a landfill case was observed along the southern part of Gökova, which is clearly an infringement. The habitat destruction is a serious threat for the wetland and coastal habitat as well as birds. The situation has been reported to EPASA by SAD and also by GAS-Der with

a written communiqué. EPASA has been following the matter with Cultural and Natural Assets Dept. of Muğla Province.

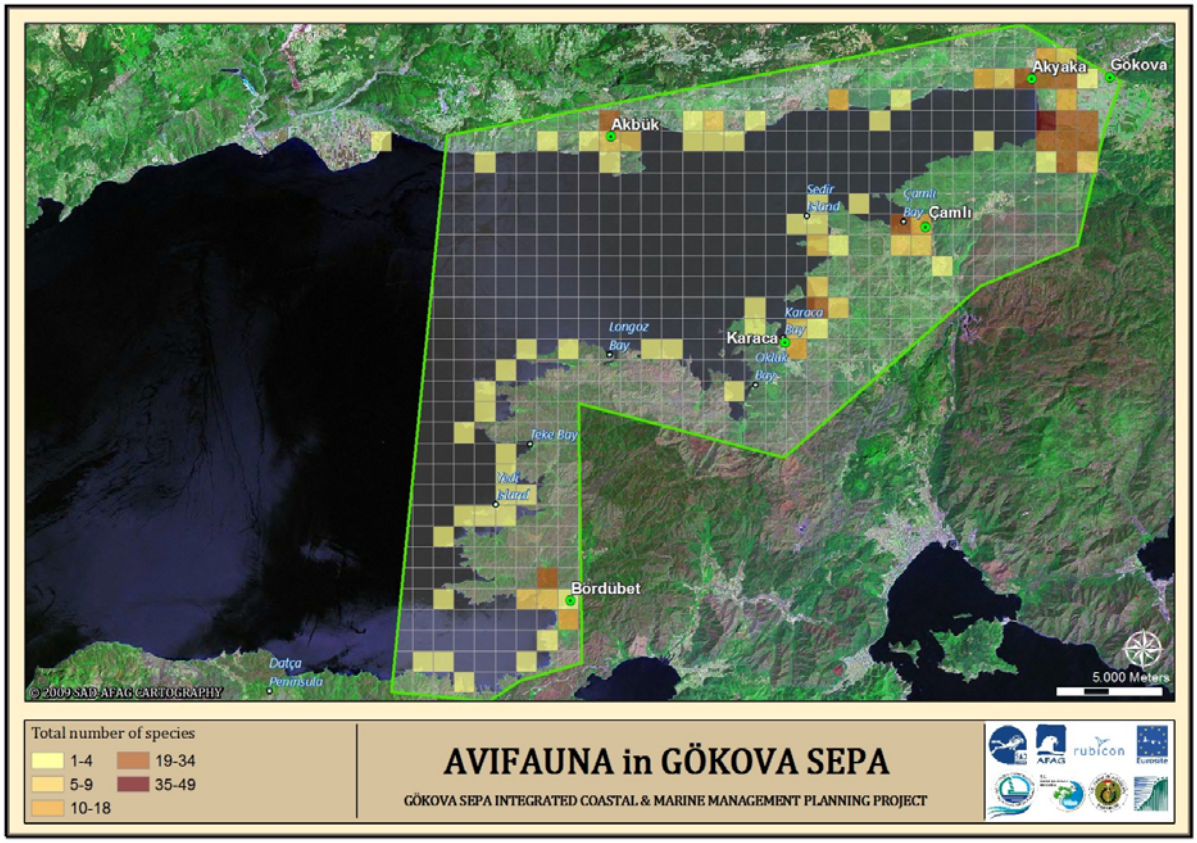

Figure 9 Avifauna distribution map (with grids in which birds are observed).

Osprey (*Pandion haliaetus*), Eleonora's Falcon (*Falco eleonorae*), Bonelli's Eagle (*Hieraaetus fasciatus*), Shag (Phalacrocorax aristotelis desmatestii), Audouiin's gull (*Larus audouinii*), Caspian tern (*Sterna caspia*), Krüppers' Nuthatch (*Sitta krueperi*) and Rueppel's warbler (*Sylvia rueppeli*) are among the important bird species that should be protected together with their habitat in the project area. All the raptors are sensitive and populations are decreased throughout Turkiye. In the project area the populations of all the raptors are small. The heavy hunting pressure and poaching seem the main reason for the diminished raptors population.

Although the Yellow-legged gull (*Larus cahcinnans*) is not endangered species, they inhabit in the untouched wild habitats including remote and pristine coasts and breed on the islands along the southern coasts of Gökova SEPA. Shags are also observed on the coasts of the islands

along with the numerous untouched mainland coasts as given in this chapter. Therefore, all the islands should be protected and be included in the management planning not only for this colonially breeding marine birds but also critically endangered Mediterranean monk seals that are frequently observed along the islands' coasts. The most important precaution should be to develop an integrated management planning and implement this plan so as to avoid from development and habitat destruction along the coasts, forests and wetlands where marine birds, water birds and raptors as well as passerines live.

1.1.6 Mediterranean Monk Seal

The component consultants N. Ozan Veryeri, Cem O. Kıraç and Harun Güçlüsoy had 17 days of field study under this research component (ANNEX 15).

Monk seal studies were carried out using two methods; 1- Field studies in search of monk seal caves along whole Gökova SEPA coasts and 2- Interviews with local fishermen and other related local people to obtain 1st hand seal sighting information.

Total 35 monk seal sighting data have been obtained throughout this project. 8 of the sightings have been gathered from FokData seal sighting database of SAD-AFAG while remaining 25 sighting were obtained through interviews and 2 sightings were directly made by the project team. In May 2010, an adult female monk seal has been observed along the northern coast of Gökova SEPA near the north border, so called as Foçinler which means "seal caves" (Foça İnleri).

There are 5 to 9 monk seals occupying Gökova SEPA area. The monk seals existing in Datça SEPA and Gökova SEPA are thought to be in interaction due to relatively short distance for monk seals. Monk seal Badem has been rehabilitated and cared in Gökova marine Animals Rehab Center of SAD. And after released in each autumn every time she did not left the Gökova SEPA and spent most of the time in Akbük, Ören, Akyaka, Sedir Island, Yediadalar and Karaca as favorite habitats.

The most important monk seal habitats exist along the northern coast of Gökova SEPA between north border (just next to Ören town) called as Foçinler and Çınar beach in the east with 9 caves

suitable for breeding and at least 30 caves and caverns suitable for resting. Especially the western part of north coast of Gökova SEPA have utmost importance for monk seals as the team observed an adult female seal inside a monk seal cave. See video on http://www.sadafag.org/gokova/index.php?bolum=videolar.

The detailed analysis on monk seals sightings and habitat is given in Figure 10. Since monk seals are strictly protected in accordance with national legislation and internation conventions that Turkiye party to, the species and habitat should be protected strictly and the habitat quality should be monitored very closely. The most important precaution is to control development including road construction and housing along the indicated coasts.

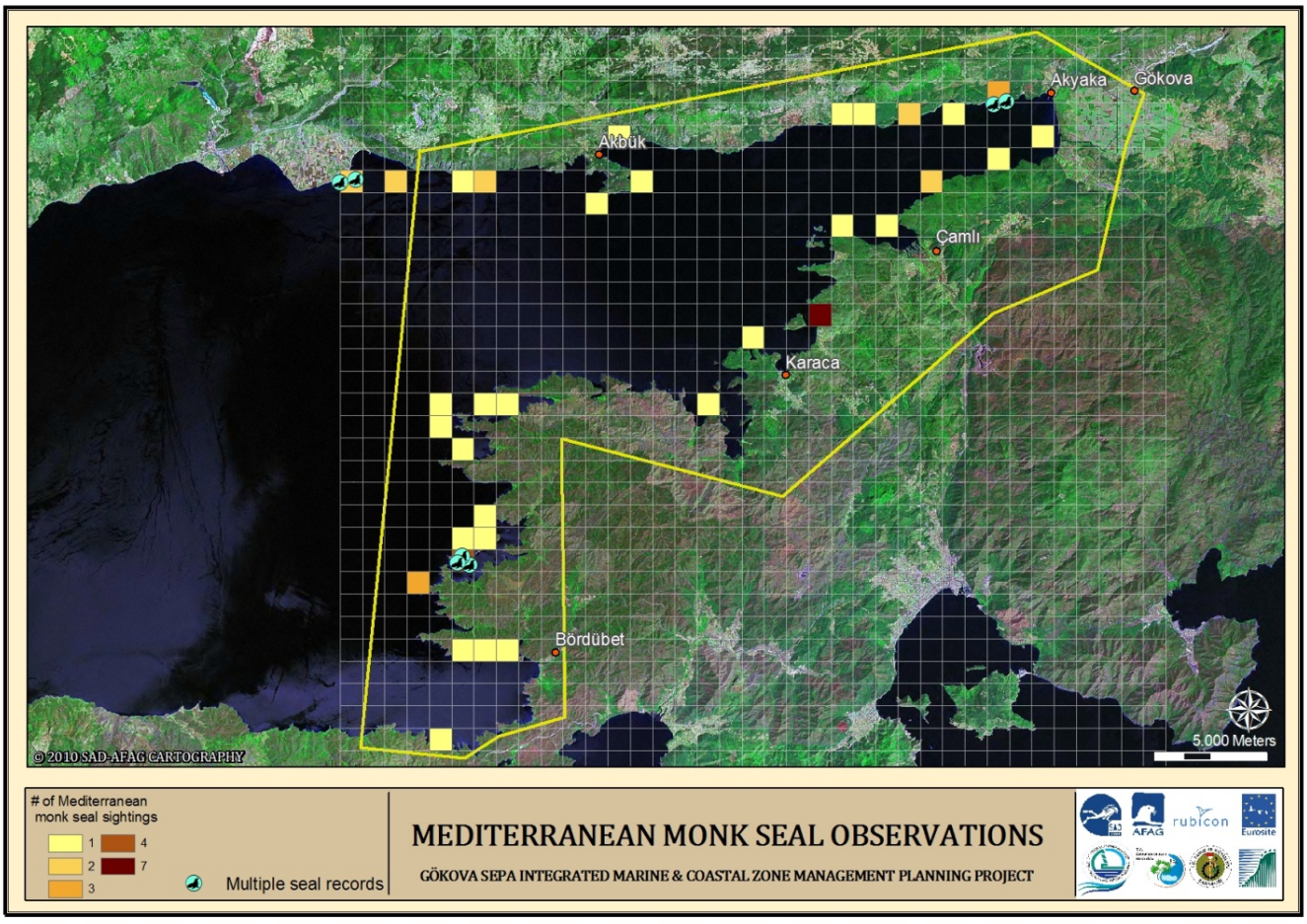

Figure 10 Mediterranean monk seal sighting locations within Gökova SEPA.

ACTIVITY 1.2 SOCIO-ECONOMIC VALUES (ACTUAL AND POTENTIAL) ASSESSED

1.2.1 Local people and human activities studied and analyzed (tourism, fishery, agriculture, yachting & daily boat excursions)

A questionnaire was applied to local main stakeholders between 21st and 24th March by SAD-AFAG team comprising Semiha Demirbaş, Denizcan Durgun, N. Ozan Veryeri, Ayhan Tonguç and Mustafa Ateş (ANNEX 17). The questions of survey were prepared by Gökhan Kaboğlu, Semiha Demirbaş, Assist. Prof. Vahdet Ünal, Bahar Suseven, Ayhan Toprak, N. Ozan Veryeri and Cem Orkun Kıraç. The target occupational groups are fishermen, tourism employees, excursion boat tours, yachters and farmers. The survey were applied totally 116 local participant with those details; Tourism (38), Boat tours (15), Fishermen (28) and Farmer (35), mainly in Akyaka, Gökova and also along the northern coasts, Turnalı and Akbük, and in the southern coasts Gökçe, Çamlı, Akçapınar, Bucak, Okulyanı, Ovacık and Karaca settlements.

Important replies from questionnaires are listed below.

Do you know the area where you live located within SEPA?			
Sectoral Group	Reply	Number	Percentage
Fishermen	YES	28	100
	NO	0	0
	I don't know	0	0
Farmers	YES	32	94
	NO	1	3
	I don't know	1	3
Boat Tour Owners	YES	11	74
	NO	0	0
	I don't know	4	26
Tourism	YES	32	84
	NO	1	2
	I don't know	5	14
Do the people of Gökova obey rules about nature protection?			
Sectoral Group	Reply	Number	Percentage
Fishermen	YES	15	40
	NO	11	34
	I don't know	2	6
Farmers	YES	27	77

	NO	5	14
	I don't know	3	9
Boat Tour Owners	YES	9	60
	NO	6	40
	I don't know	0	0
Tourism	YES	25	66
	NO	11	28
	I don't know	2	6

Which activities are against nature protection? List 3 most important.

Fishermen

Solid waste	10
Illegal fishery(spearfishing)	6
Illegal fishery (trawler/purse seiner)	5
The arrangement of tour boats in Kadin Azmak river	4
Lack of infrastructure	3
Thermal power plant	2
Coastal development pressure	2
Illegal discharge of oily waste	2
Forest fires	1
Pesticides	1
Tourism pressure	1

Farmers

Chemicals / pesticides	5
Hunting	3
Solid waste	3
Daily tourism	2
Field opening (cutting woods)	1
Illegal tree cutting	1
Coastal development pressure	1

Boat Tour Owners

Solid waste	6
Hunting	5
Controlling mechanism	4
Restaurants around Kadin Azmak river	4
Construction pressure	2
Having no management plan	1

Tourism

Solid waste	14
Boats	12
Daily tourism	10
Overuse	9
Deficiency in infrastructure	8
Agricultural chemicals	6
Restaurant boats	5
Hunting	5
Education	4
Fire	1
Water breaker	1
Thermal power plant	1
Stray pets	1

What are your suggestions to improve of your own sectoral group? List 3 most important.

Fishery

Controlling	**19**
Fishing systems and legislations should be regulated	10
Increasing prohibitions	8
Education	6
İmproving cooperatives	5
Pier construction and boat yard needs	4
Credit support	4
Digging the area in front of the waterbreaker	3
Collecting ghost nets	1
Decreasing tax	1

Farmer

Awareness raising	**12**
Government promotion	9
Improving marketing	8
Cleaning drainage canals	8
Decreasing prices of inputs	6
Agricultural education	5
Cold storage	4
Developing a watering project	3
Drop water irrigation	2
Organic agriculture	2
Controlling well drilling	2
Controlling pesticides	2
Canned food factory	1
Removing SIT status	1

Appropriate chemicals	1

Bout Tour Owners

Constructing port/marina	**9**
Improving infrastructure	9
Improving capacity and quality	7
Advertising	4
Standardized prices	4
Protection	3
Diversification of nightlife	2
Surveillance and monitoring	2
Education	2
Credit support	2
Enriching tour routes	1

Tourism

Improving infrastructure	**15**
Increasing service quality	12
Improving capacity and quality	11
Advertising	11
Landscape designs	10
Protection of nature	8
Alternative tourism	8
Controlling	8
Fasten bureaucracy	7
Supporting facilities	5
Planning	5
Protection of architecture	4
Organizing	4
Identification of target group	4
Improving beaches and water sports	3
Construction of port/marina	2

The name and locations of the daily tourist facilities within Gökova SEPA have been produced through the direct observation during field studies (Table 4) and demonstrated in Figure 11.

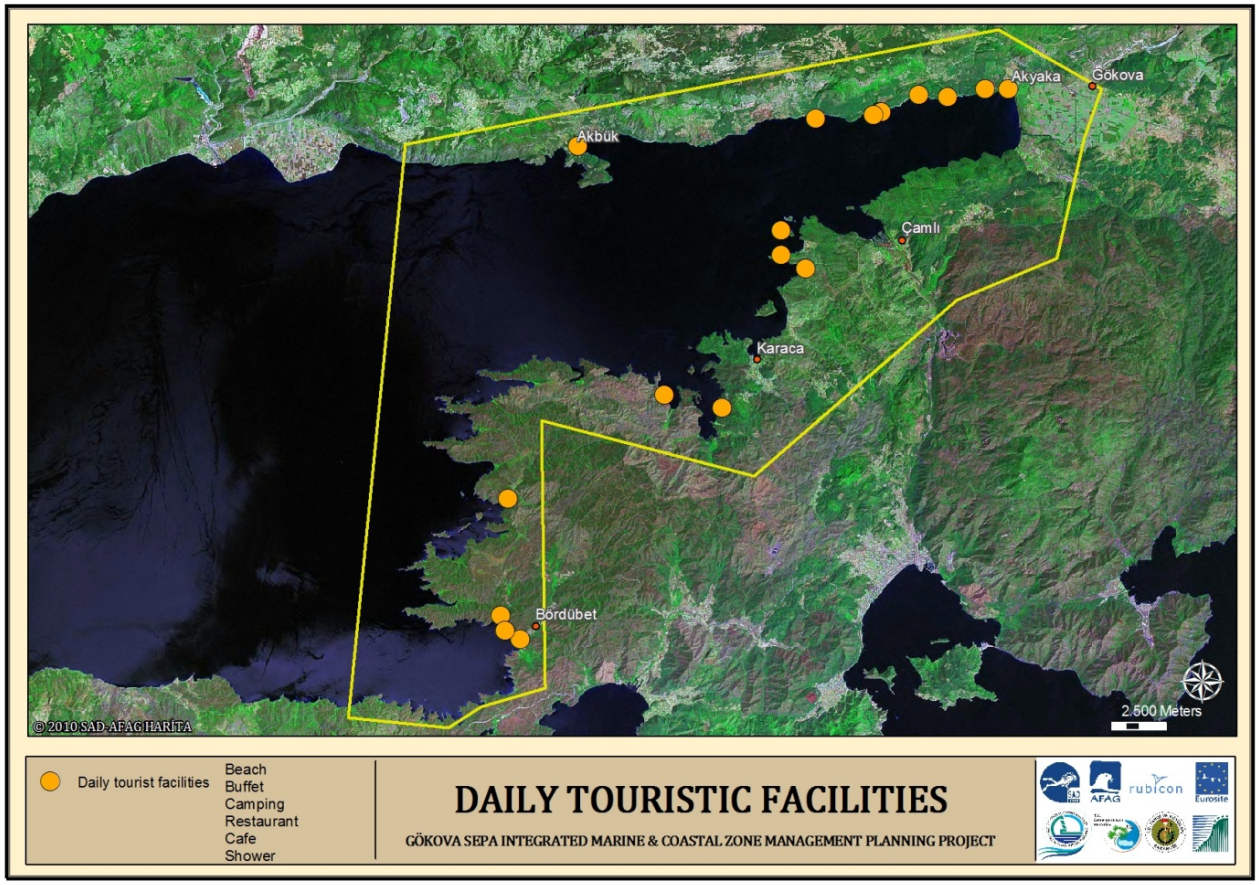

Figure 11 Daily touristic facilities in Gökova SEPA

Table 4 Name, locations and types of daily tourist facilities

	Location	Services
1	Incekum	Beach, Buffet
2	Çiçek cove	Beach, Camping
3	Bordubet 1	Beach
4	Bordubet 2	Beach, Restaurant, Cafe
5	Amazon	Beach
6	Akbük	Beach, Shower, Restaurant, Camping, Buffet
7	Turnalı 1	No Service
8	Turnalı 2	No Service
9	Turnalı 3	No Service
10	Turnalı 4	No Service
11	Çınar Beach	Beach, Restaurant
12	Maden İskelesi	Beach, Accommodation, Restaurant
13	Akyaka	Beach, Restaurant Accommodation, Camping
14	Boncuk Cove	Beach, Camping, Buffet
15	Sedir Island	Beach, Buffet, Shower
16	Küfre Cove	Beach
17	Okluk Cove	Restaurant, Shower

1.2.2 Fishery management

The materials include formerly studied works, records of the fishery cooperatives in Gökova SEPA, participatory observations techniques, face-to-face interviews with fishers as well as management board of cooperatives. Assist Prof Vahdet Ünal had scanned the literature (Tekoğul and Gökkuş, 1997; Cihangir et al., 1998; Erdem, 2001; Erdem et al., 2002; Cengizler et al.2002; Ciriker al, 2005; Öğretmenler et al., 2005; Ünal et al, 2005; Ünal and Akyol, 2005; Filiz et al., 2005; Ünal, 2006; Okuş et.al, 2006, 2008; Göncüoğlu, 2008; Ceyhan et.al, 2009). He applied 101 questionnaires to the fishermen who are members of fishery cooperatives and also outsiders to assess socio-demographic characteristics, their approaches to current management strategies, operational characteristics etc (ANNEX 18). Another type of the questionnaire was applied to the leaders and designed to outline cooperative activities.

Fishermen (members or non-members) use traditional and small-scale fishing gears such as longline and gillnet, and perform fishing during the year with approximately 8.1±0.6 m length fishing boats in Gökova SEPA (Table 5).

Table 5 The target species fished in Gökova Inner Bay, fishing gears and fishing periods (Ünal and Erdem, 2009b).

Species	Target Species	Fishing Gear	Fishing Period
Octopus *(Octopus vulgais)*	X		November-April
Amberjack *(Seriola dumerili)*	X	Gillnet/Entangling	April-September
Hake *(Merluccius merluccius)*		Gillnet/Entangling Longline	Februrary-June
Red mullets *(Mullus* spp.*)*	X	Gillnet/Entangling	Februrary-May
Narrow barred Spanish mackerel *(Scomberomorus commerson)*	X	Gillnet/Entangling	December/ March-April
Leer fish *(Lichia amia)*		Gillnet/Entangling	November- December/ March- April
Sea bream *(Sparus aurata)*	X	Longline	July-October
Grey triggerfish *(Balistes capriscus)*		Gillnet/Entangling	April-May
Common sole *(Solea solea)*	X	Gillnet/Entangling	December-February
Painted comber *(Serranus cabrilla)*		Longline Gillnet/Entangling	All the year round
Barracuda *(Sphyraena sp.)*		Gillnet/Entangling	January-February/ March-April
Horse mackerel *(Trachurus sp.)*	X	Gillnet/Entangling	Winter Months
Picarel *(Spicara smaris)*		Gillnet/Entangling	April-May

Goldblotch grouper *(E. costae)*	X	Longline-Gillnet/Entangling	July-September
Two-banded sea bream *(Diplodus vulgaris)*	X	Longline	All the year round
Shrimp *(Penaeus kerathurus)*	X	Gillnet/Entangling	March-June
Striped mullet *(Mugil* spp.*)*	X	Gillnet/Entangling	March-April
Common pandora *(Pagellus erythrinus)*	X	Longline Gillnet/Entangling	All the year round
Chub mackerel *(Scomber japonicus)*		Gillnet/Entangling	Summer months
Silver scabbardfish *(Lepidopus caudatus)*		Longline Gillnet/Entangling	September-November
Bogue *(Boops boops)*		Gillnet/Entangling	All the year round
Grouper *(Epinephelus aeneus)*	X	Longline Gillnet/Entangling	July-September
Sea bass *(Dicentrarchus labrax)*	X	Gillnet/Entangling	All the year round
Brushtooth lizardfish *(Saurida undosquamis)*		Gillnet/Entangling	All the year round
Brown meagre *(Umbrina cirrosa)*		Gillnet/Entangling	October-November/ April-May
Goldband goatfish *(Upaneus molluccensis)*	X	Gillnet/Entangling	February-May
Dusky grouper *(Epinephelus marginatus)*	X	Longline Gillnet/Entangling	All the year round
Atlantic bonito *(Sarda sarda)*		Gillnet/Entangling	November-April
John dory *(Zeus faber)*		Gillnet/Entangling	November-December
Sauppe *(Sarpa salpa)*		Gillnet/Entangling	May-July
Dentex *(Dentex dentex)*	X	Longline Gillnet/Entangling	All the year round
Dusky spinefoot *(Siganus sp.)*	X	Gillnet/Entangling	July-August
Axillary sea bream *(Pagellus acerna)*		Gillnet/Entangling	All the year around

In addition, random fish samplings are periodically exercised during the year (2009-2010), also fish length data which have been collected on these species since 2006 are used to compare to the legal fishing lengths indicated in the notification. In addition, preliminary analysis of length frequency distribution (LFD) of most common and valuable species such as white grouper *Epinephelus aeneus,* Common pandora *Pagellus erythrinus and* sea bream *Sparus aurata* were performed in order to understand population status for these species in Gökova SEPA. Population status was assessed from length frequency data using the simple methods. Twice a month for 2-3 days duration were spent in the Gökova SEPA in order to reach the goals of the study and collect desired data. Interviews were carried out with the heads of fishery

cooperatives as well as 101 local fishermen in the second period of the study. Past records of the cooperatives were gathered from fishery cooperatives.

Fishery supplies sea food to local market, generate income and employment in the local economies of Akyaka, Akçapınar, Sarnıç-Akbük, Çamlı, Ören, Gökçe located along the Gökova Bay. There are three active fishery cooperatives in the study area. The oldest cooperative was founded in 1973 (The Akcapinar Fishery Cooperative) (Figure 12).

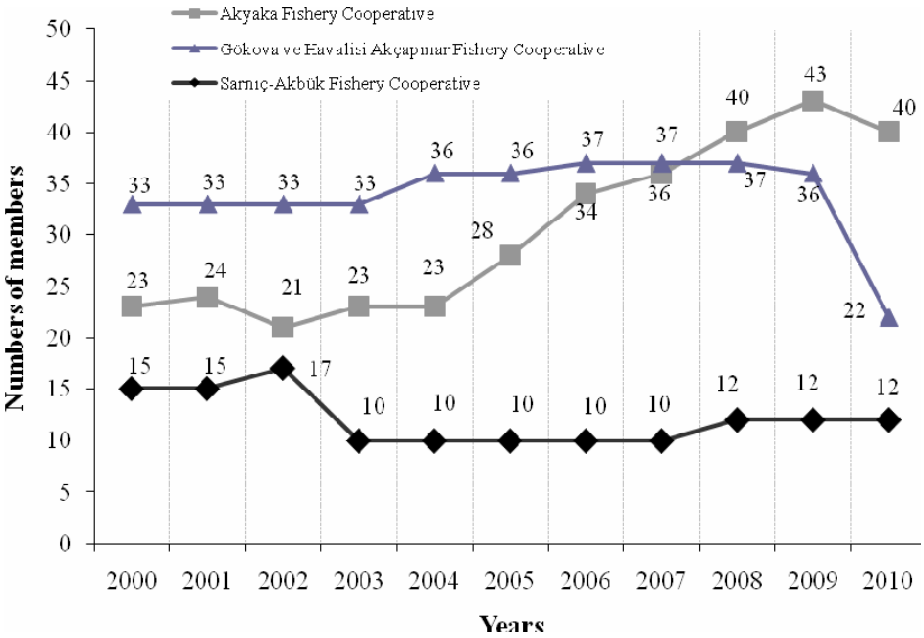

Figure 12 Changes in number of cooperative members over the last decade in Gökova Bay SEPA.

Cooperation rate (numbers of fishery cooperative members divided by numbers of total fishers) among small-scale fishers in Gökova SEPA is 60% (Figure 13).

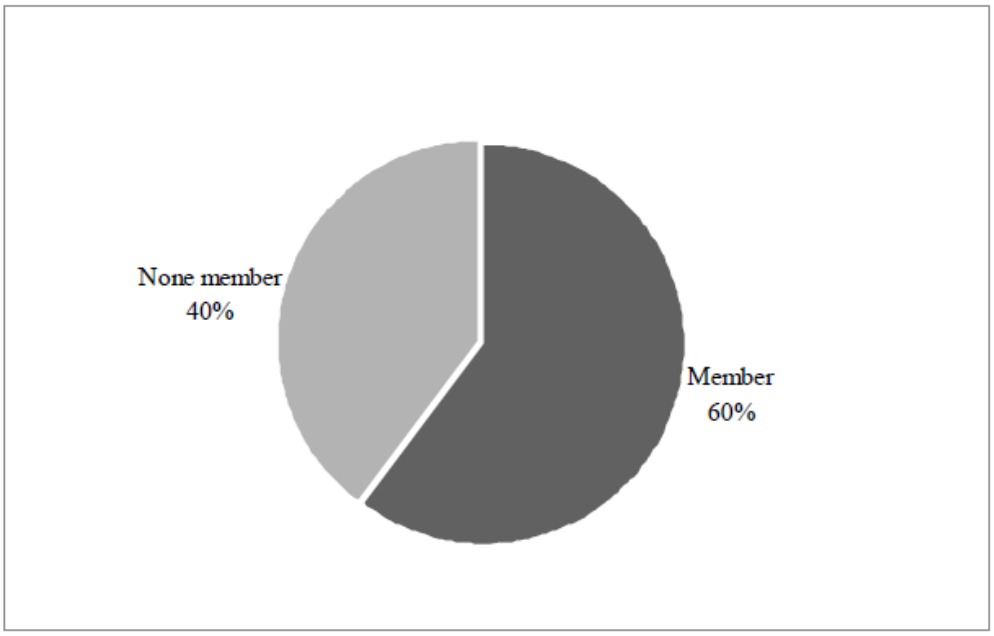

Figure 13 Cooperation rate among fishers

The Akyaka Fishery Cooperative is an active fishery cooperative in the region and has 40 members, but all fishermen in the village are not cooperative members. Gillnet and long line fisheries dominate small-scale fishery. Species belong to *Sparidae* and *Epinephelinae* are the most important and target species of the region.

Akçapınar is a region with a population of approximately 516 inhabitants. It is located on southern Turkish Aegean coast where the Gökova Bay meets the land. Fishing is the main economic activity together agriculture in the village. The Akyaka Fishery Cooperative was founded in 1973. All fishermen in the region were cooperative members until 2008. However, because of mismanagement of the cooperatives and corruption, membership rate of the cooperative started to decreases between the years 2006-2009. The general assembly was held in February, 2009 and the management board of the cooperative was changed. According the face-to-face interview carried out with the head of fishery cooperative, actual registered members and active fishermen (vessel owners) in Akçapınar are 22 and 10 respectively.

Sarnıç is a village located 10 km away from Akbük Bay with a population of approximately 400 inhabitants. There are 12 professional and 5-6 semiprofessional fishing vessels in Akbük. All the owners of professional fishing vessels in Akbük are members of Sarnıç-Akbük Fishery Cooperative.

Although small scale vessels dominate the fishing activity in general, locally registered purse seiners also exist. There are 4 local purse seiners localized in the bay. Small-scale fishing vessels that use gill nets, trammel nets and long-lines dominate the fishing fleet in Gökova Bay. In addition, small-scale fishery offers more employments than large-scale fishery in all around the Gökova Bay. Part-time fishermen are also quite common in small-scale fishery.

Figures 14, 15, 16, 17 show fishery mooring areas, encircling nets, traditional long line, trammel and gill nets fishing areas in Gökova Bay.

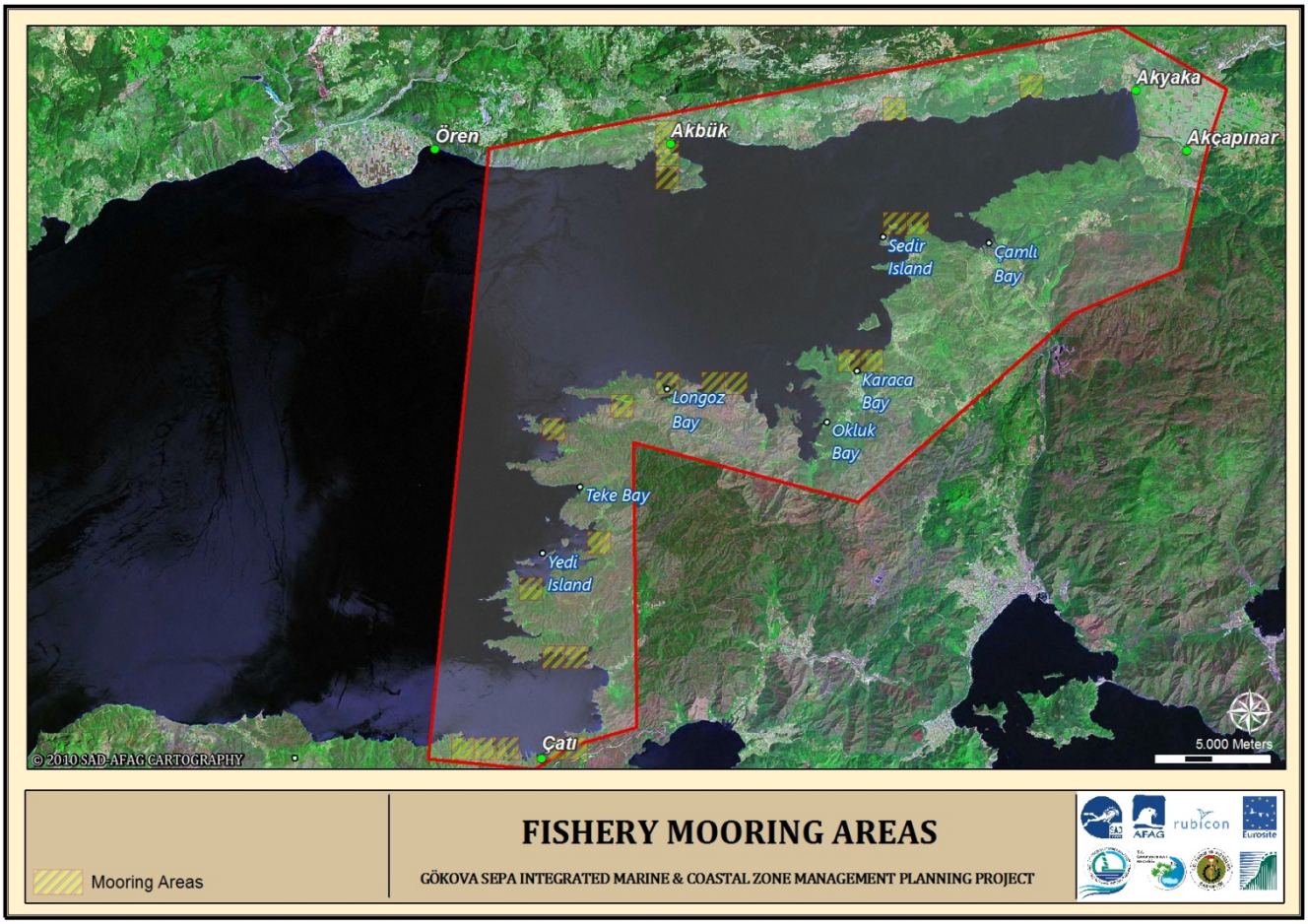

Figure 14 Fishery mooring areas in Gökova Bay

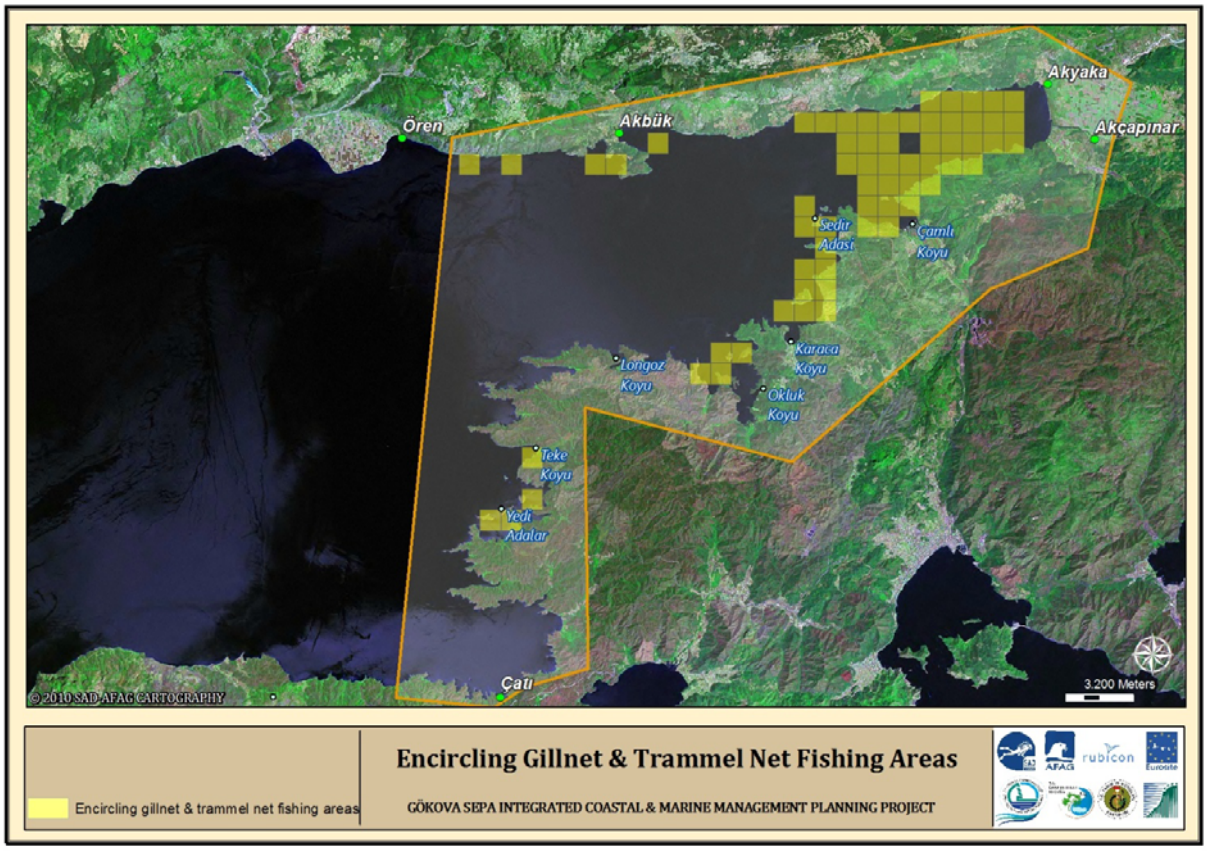

Figure 15 Encircling nets fishing areas actually practiced in Gökova Bay.

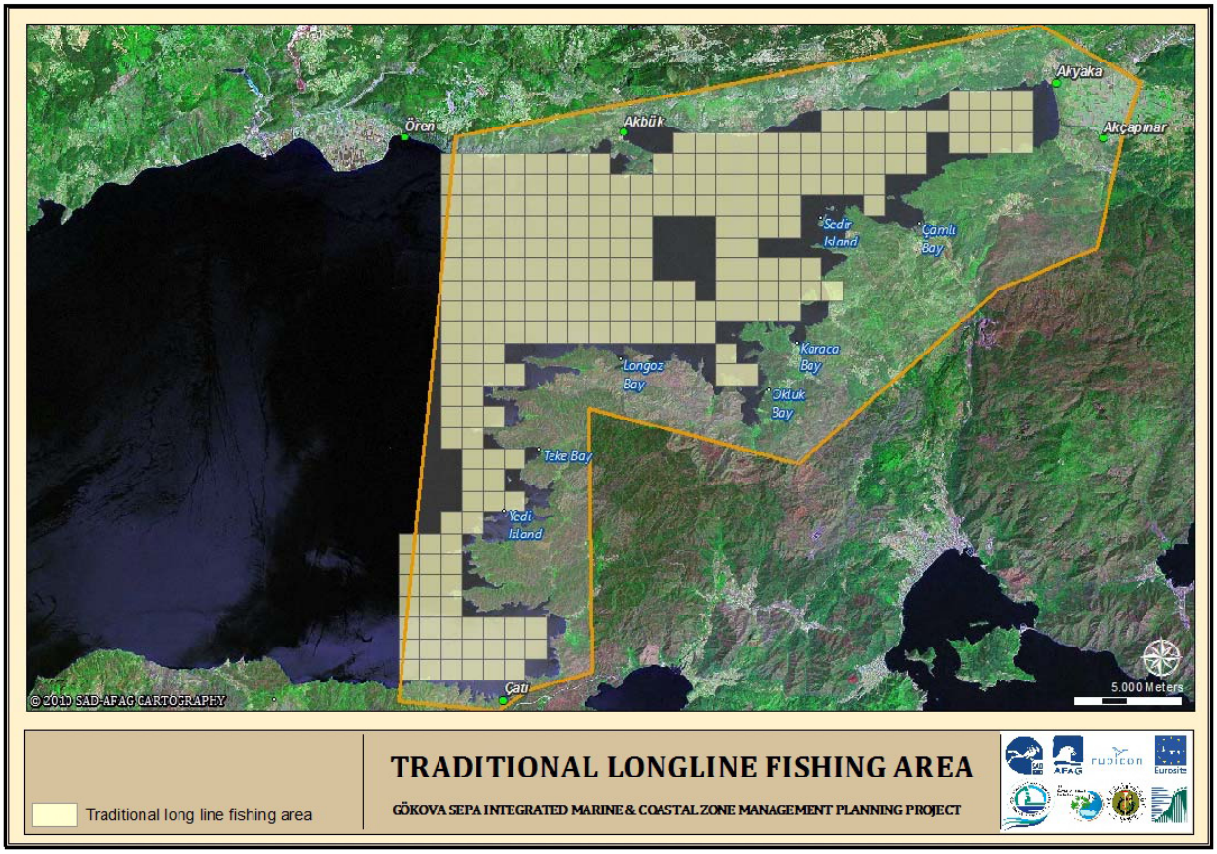

Figure 16 Traditional longline fishing areas actually practiced in Gökova Bay SEPA**.**

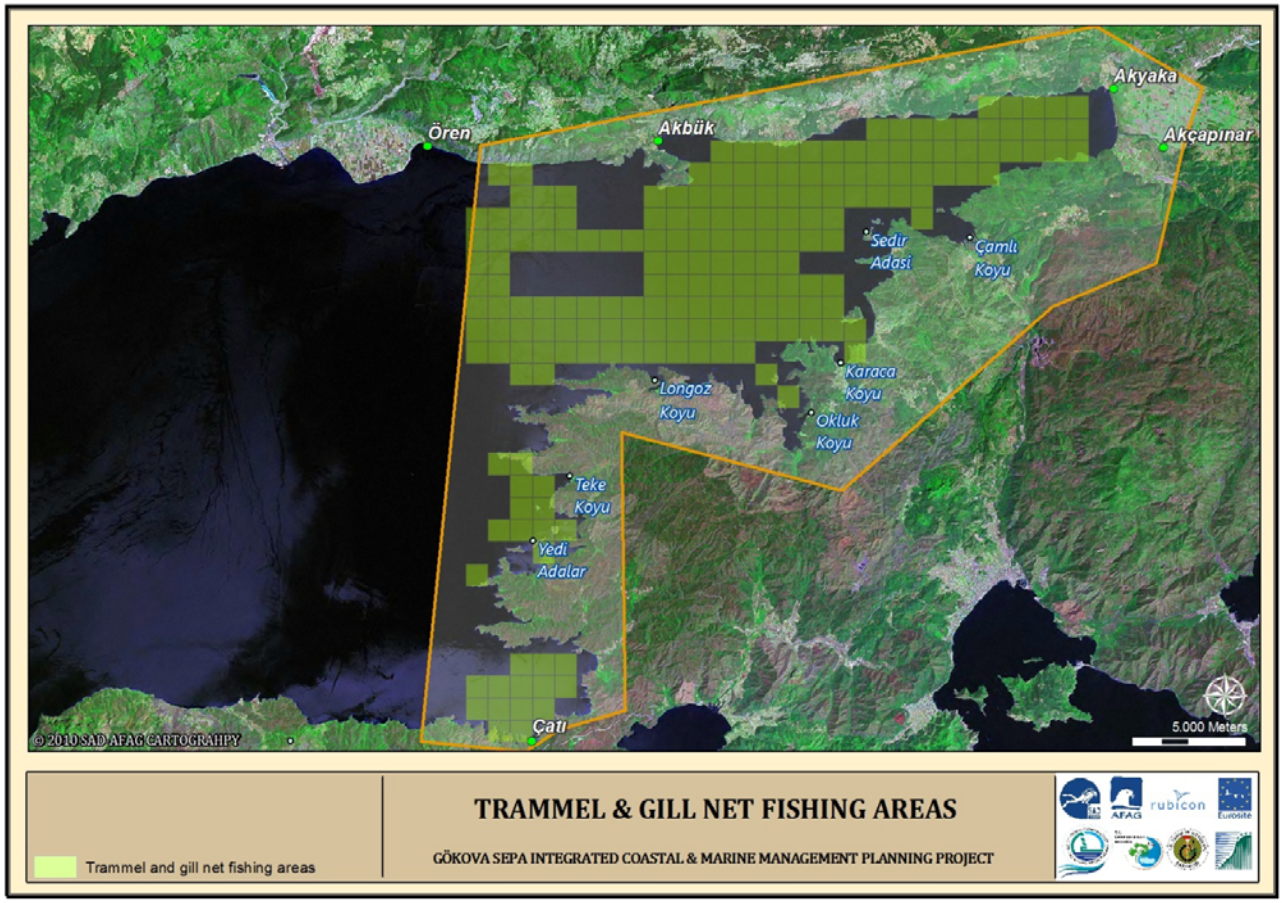

Figure 17 Trammel and gill nets fishing areas practiced in Gökova Bay SEPA.

Small-scale fishing boats presently operate in Gökova SEPA is about 115. Distribution of these boats is as follows; Akçapınar (21), Akyaka (42), Akbük (13), Ören (16), southern coast of the bay, Bördübet, Çamlı etc. (19) and outside of the bay, Bodrum, Datça (8). The map below shows the location and distribution of fishing boats in Gökova SEPA (Figure 18).

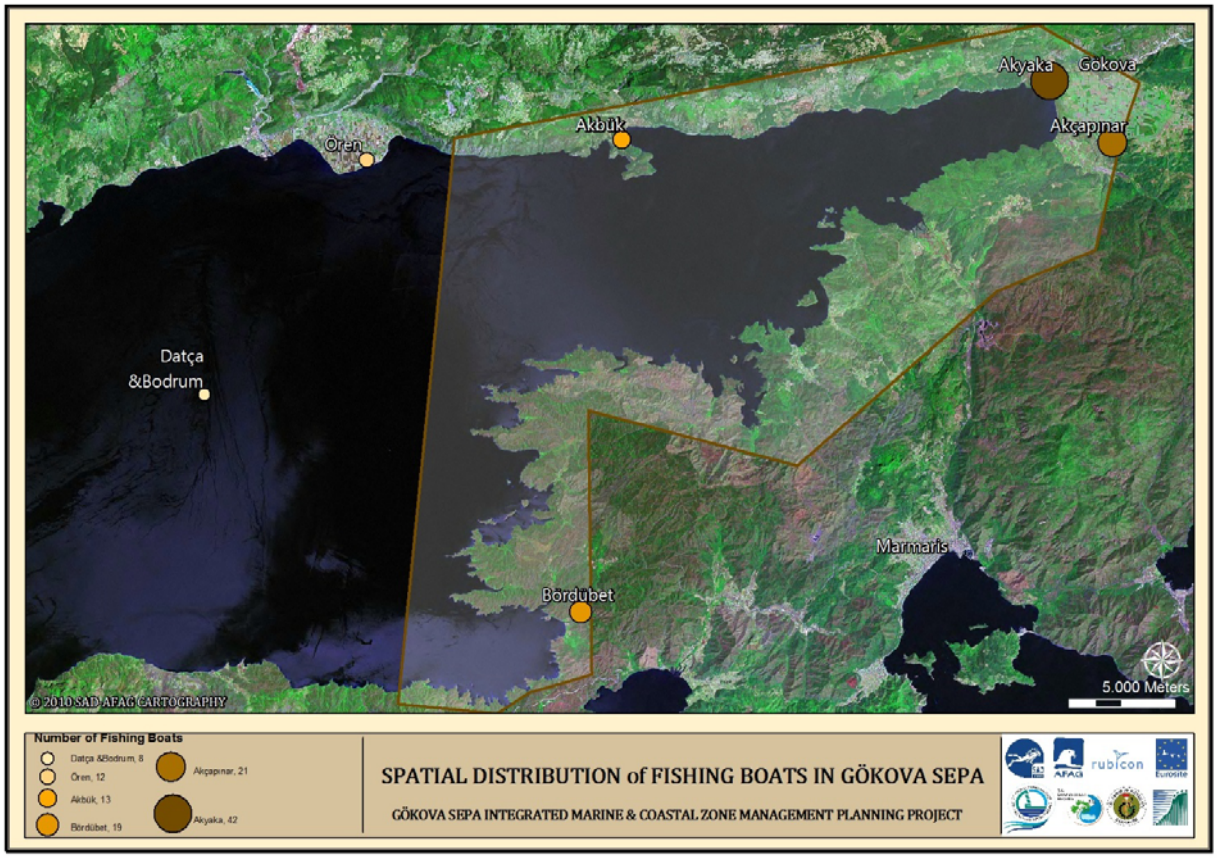

Figure 18 Spatial coastal distribution of small scale (artisanal) fishing boats in Gökova SEPA.

The fisheries in the study area have multispecies and multigears nature in common to the Mediterranean Sea. According to the earlier studies (for instance; results of the SMAP III project), in terms of quantity top ten species are *Octopus vulgaris, Epinephelus aeneus, Sarda sarda, Merluccius merluccius, Pagellus erythrinus, Sphyraena sp., Saurida undosquamis, Penaeus kerathurus, Sparus aurata and Mugil spp.* in the project area. Considering value of the species or their contribution to the gross income of the cooperatives, *Epinephelus aeneus, Penaeus kerathurus, Octopus vulgaris, Pagellus erythrinus, Solea solea, Sparus aurata, Mugil spp., Diplodus vulgaris, Upaneus molluccensis, Merluccius merluccius* are the most economically important fish species in the Gökova SEPA. ANNEX 19 shows quantity and value of species caught in Gökova Inner Bay for the years 2006-2008 while ANNEX 20 indicates the current situations in terms of quantity and value of fish species in Gökova SEPA.

Illegal fishing is considered the most important problem among local traditional fishermen due to diminishing fishing income and increasing illegal spearfishing which target only high value species such as groupers. Fishery cooperatives succeeded to cease fishing by dynamite in the

region long time ago, but illegal spearfishing -especially practiced during the night times by light and scuba equipment- replaced dynamiting.

Existing management measures and regulations in Gökova Bay fishery;

- *Restrictions on hook sizes*
- *Regulations on species*
- *Restrictions on closed areas and seasons*
- *Regulations on fishing gears*
- *Regulation on "No-take zones"*

Assist. Prof. Vahdet Unal also prepared a detailed draft Fisheries Management Plan and a general assessment of current situation in Gökova Bay in his final report (ANNEX 21).

1.2.3. Organic aquaculture

The component consultant Damien Dessane completed the study of production standards definition and pre-feasibility study for organic marine aquaculture in Gökova Bay (ANNEX 22). Proposals for organic aquaculture fish farm locations were demonstrated in Figure 19. He also prepared a project proposal for the development of inland and off-shore Organic Aquaculture in Turkey with the project title "Organic Aquaculture Information Exchange Network" and identified proper sites for organic aquaculture. He prepared a separate report about "Production standards definition, legal proposition for harmonization with EU regulations for Organic Marine Aquaculture in Gökova bay, Turkey" with the legal consultant Kemal Battal (ANNEX 23). A gap analysis has done according to this there are important gaps indicated in the gap analysis study between Turkish legislation and EU acquis concerning organic aquaculture due to below reasons (Table 6);

- Organic Farming Law which entered into force 1/12/2004 and Regulation on Essentials and Implementation of Organic Farming which entered into force 10/06/2005 has not include further developments in the relevant EU acquis.
- Some important rules of EU acquis on organic fish farming and all rules of Seaweed and Mollusks have not been transposed into Turkish legislation when Organic Farming Law and Regulation on Essentials and Implementation of Organic Farming are prepared.
- The rules on organic fish farming have not been regulated in the separate and exclusive regulation in Turkish legislation. In addition some implementations of organic fish farming shall be subject to same rules of organic agriculture.

Table 6 Results from the GAP analysis

THEME	SUBJECTS	PROVISION IN THE TURKISH LAW AND DIRECTIVES	MISSING REQUIREMENTS
Fish	General heading and provision	provided	Advantages and general conditions and characteristics by which the production of organic aquaculture products is carried out.
	Site selection	provided	(a) The pollution level authorized in the site should be further defined, probably in a separate regulation on marine environment. (b) A Sustainable Management Plan should be asked to the operator before setting up its installations
	Production units separation (Conventional/Organic)	*not provided*	Rules of separation with other conventional aquaculture animals and from other fish farms (contamination avoidance), cf. husbandry practice
	Origin of aquaculture animals	*not provided*	The conditions and place of the hatchery from which the juveniles are taken should be provided in the Turkish Regulation.
	Husbandry practices	provided	(a) The organic animals shall be kept separate from other aquaculture animals. (b) Sufficient space, i.e. density limit for each species in the different installations (cages, ponds, etc.) should be provided as an Annex. (c) Actions, measures and warning system, in the case of accidental release (introduction in the environment) of fish, should be defined.
	Handling of aquaculture animals	*not provided*	(a) Limiting handling to the minimum to avoid stress. (b) Light and aeration conditions should be defined. (c) Slaughter technique avoiding suffering should be detailed or at least the principle given.
	Transport	*not provided*	(a) Conditions of transport (tanks cleanliness, animal density). (b) Duration of the transport should be defined for live fishes.
	Breeding	provided	Genetic modification of the fish is also provided in the Turkish regulation, however, polyploidy, hybridization and cloning are not specifically mentioned.
	Feed	provided	(a) The European regulation is much more permissive regarding the use of conventional feed, at least as a derogation (30% instead of 20% in the Turkish regulation. (b) The ratio of feed from vegetal origin to be given to carnivorous fishes should be specified. (c) The list of feed material authorized in the Annex should be harmonized.
	Disease prevention	*not provided*	(a) The prevention of disease and the means to achieve it should be defined, such as the use of ultraviolet light or ozone to reduce bacteria. (b) The Animal Health Management Plan defining the biosecurity measures of the installation should be asked to the operator.
	Veterinary treatments	provided	The Turkish Regulation is very strict for invertebrate animals (i.e. molluscs) use of conventional (chemically synthetized allopathic) medicine, but is not clear about the cases of possible usage of conventional medicine for fishes.
	Cleaning and disinfection	*not provided*	Products for cleaning and disinfection should be listed in the Annexes.
	Recirculation systems & Containment	*not provided*	This subject should be addressed in the Turkish Regulation.
	Conversion period	*not provided*	This subject should be addressed in the Turkish Regulation. In the EU Regulation, for each aquaculture systems, a conversion period is defined, e.g. for open-water facilities, three months are necessary. The certifier may reduce this conversion period on the basis of documents proving that the facility was not treated with any chemically synthesized product (this, of course, does not apply to open-water facilities).
Seaweed	General heading and provision	*not provided*	The advantages of seaweed (algae) production should be stated.
	Site selection	*not provided*	Conditions of the site to produce/harvest seaweed.
	Production units separation (Conventional/Organic)	*not provided*	Minimum separation distances and protection from contamination from Conventional to Organic crops.

	Environmental assessment	*not provided*	The operator shall be responsible to carry out an Environmental Assessment before setting up his installations and at regular period.
	Nutrients	*not provided*	Only naturally occurring "fertilizers" and, if possible, as part of a polyculture.
	Pollution	*not provided*	For inland production, the effluents should be controlled.
	Density	*not provided*	The density limit is left to the appreciation of the certifier depending on best practice.
	Cleaning and disinfection	*not provided*	Physical and mechanical means are allowed to remove bio-fouling organisms (see Glossary of terms).
	Conversion period	*not provided*	The conversion period for wild seaweed and cultivated seaweed is set as at least six months in the EU Regulation.
Molluscs	General heading and provision	*not provided*	Molluscs are filtering water and offer an advantage for treating coastal waters.
	Site selection	*not provided*	Conditions of the site to produce molluscs.
	Origin of Molluscs	*not provided*	The nature of the seed of molluscs from hatchery to be used should be defined, as well as special derogations.
	Feed for Molluscs	*not provided*	Feed should be from natural source, except for juveniles.
	Conversion period	*not provided*	The EU Regulation assigns a three months conversion period for open-water facilities.

The gaps which are indicated on gap analysis study on the below points related to organic fish farming should be removed.

- Production units separation (Conventional/Organic)
- Origin of aquaculture animals
- Handling of aquaculture animals
- Transport
- Disease prevention
- Cleaning and disinfection
- Recirculation systems & Containment
- Conversion period

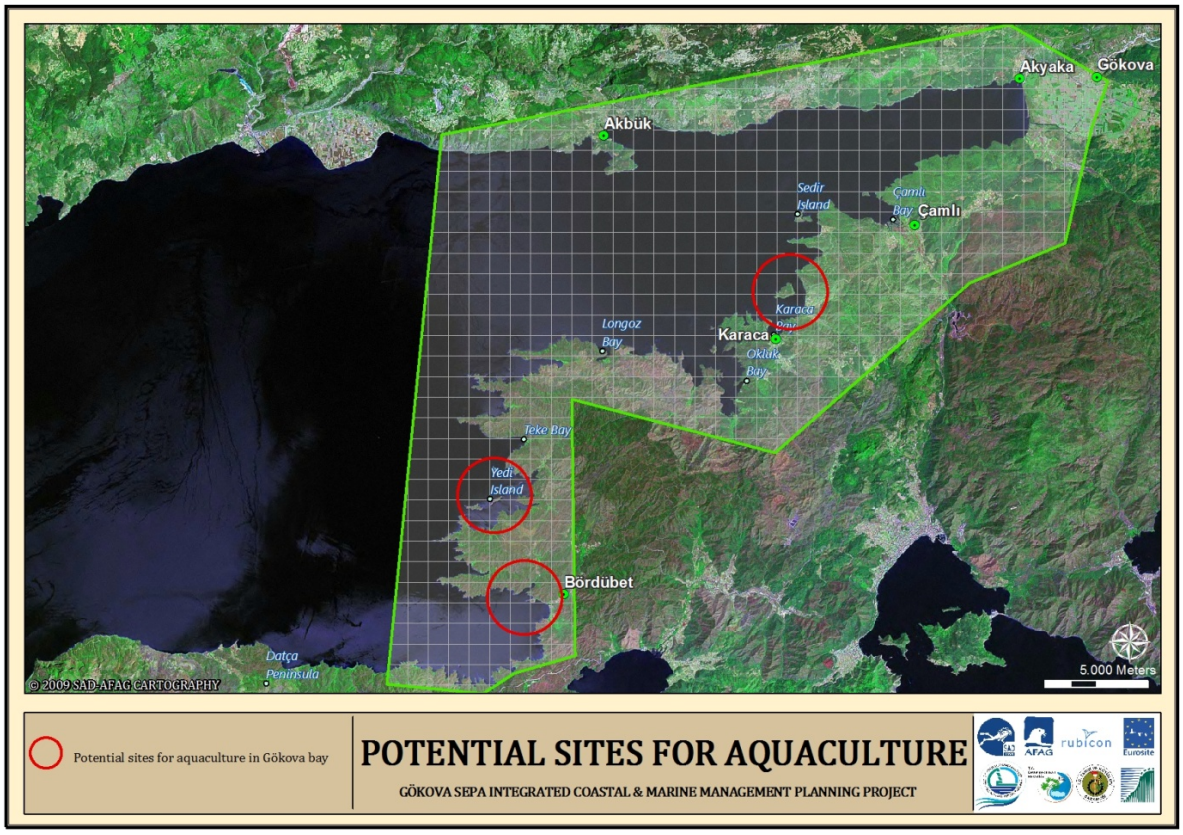

Figure 19 Potential sites for organic aquaculture in Gökova bay: cages require a maximum depth of 35 meters, a protection from strong winds and currents (the south side of the bay gives more refuge).

ACTIVITY 1.3. THREATS AND PRESSURES IDENTIFIED AND ASSESSED

1.3.1 Threats to the natural resources, habitats and biological diversity analyzed

1.3.1.1 Poaching

Hunting is forbidden all year around everywhere in the Gökova SEPA. Illegal hunting activities are one of the major problems in Gökova SEPA. During the field studies rifle shoot sounds have been heard in the wet lands mainly when avifauna surveys were carried out and hundreds of cartridges have been found and documented in several certain locations especially in and around wetlands and to a lesser extent in the forests (ANNEX 24). The cartridges have been found in Akbük wetland and vicinity (northern coasts of Gökova), Gökova plain, Çamlı (Gelibolu wetland), Bördübet and Amazon. Also local consultant Bahar Suseven reported that hunters shoot song birds as well as martens or water fowl and wild boar, the hotspot being the delta

plain between Gökova and Gökçe, others go for wild boar hunts on the hill slopes (Figure 20). And wild boars can be sold to foreigners or to Marmaris Restaurants/ Hotels with a price of 150-250 TL.

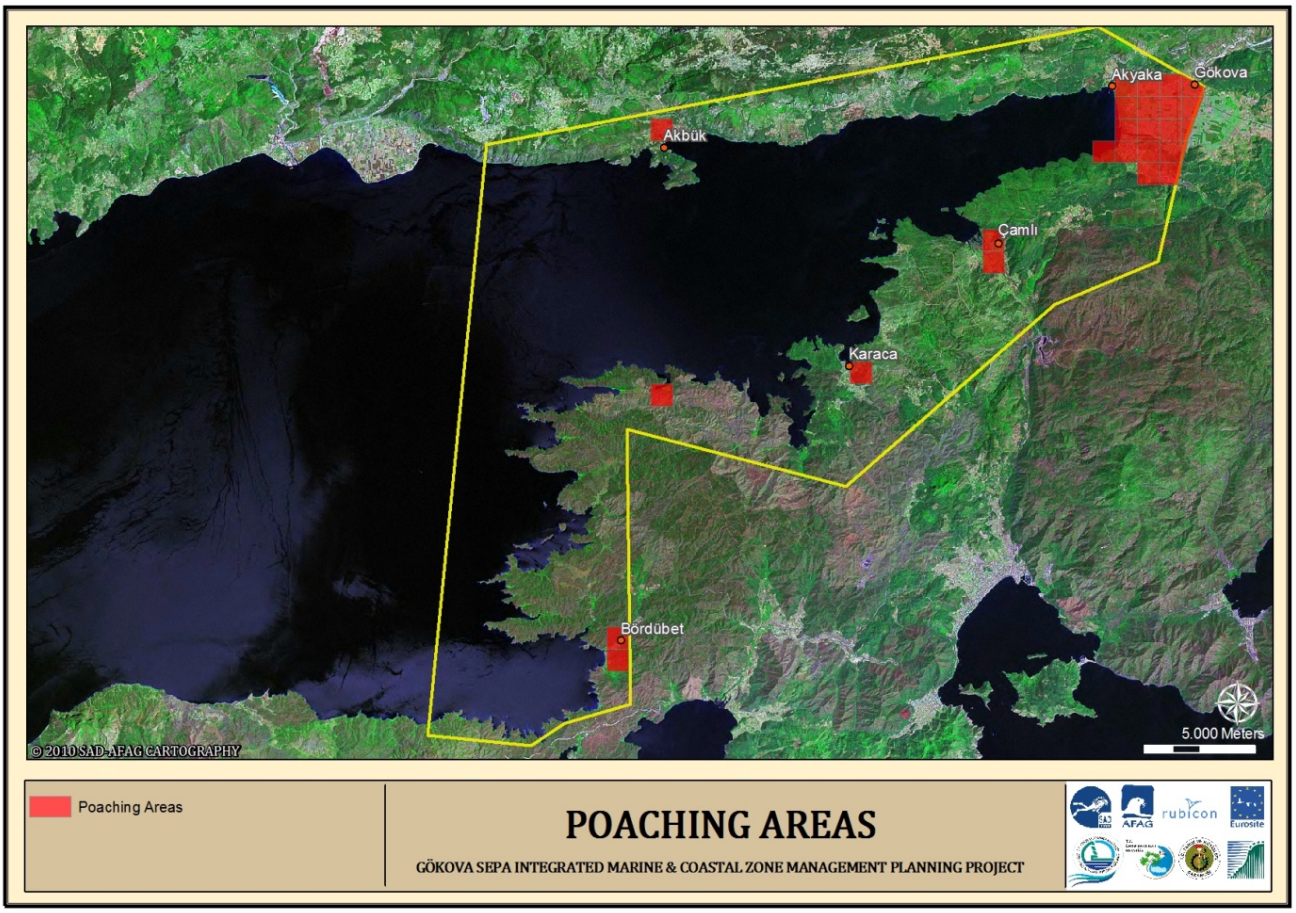

Figure 20 Poaching areas as determined during the project implementation in Gökova SEPA

1.3.1.2 Anchoring

It is noticed that effects of anchorage may be negligible in some spots such as western coast of Akbük and Gokagac Limani (Yediadalar) since the shallow margin of the local *Posidonia* beds are quite away from the shore where boats are anchored. In some areas such as Kufre, Sakli, Amazon, Çati, Longoz, Ingiliz Limanı etc. has no *Posidonia* distribution at favorite anchoring spots. On the other hand, *Posidonia* beds on some spots such as the ones at the south coast of Tuzla Bay should be well affected by boats' anchors (Figure 21) (ANNEX 25).

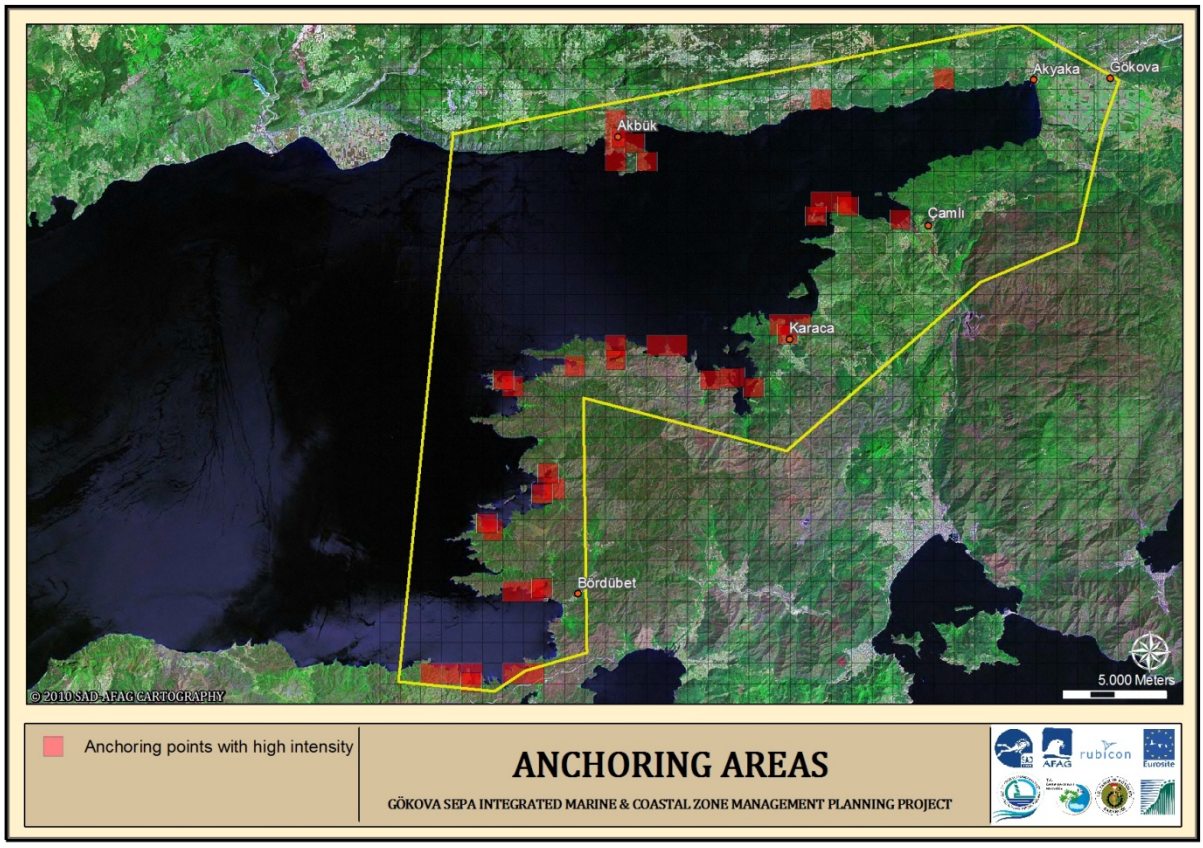

Figure 21 Anchoring areas in Gökova SEPA

1.3.1.3 Illegal fishing

Illegal fishing is considered the most important problem among local traditional fishermen due to diminishing fishing income and increasing illegal spear fishing which target only high value species such as groupers. Fishery cooperatives succeeded to cease fishing by dynamite in the

region long time ago, but illegal spearfishing -especially practiced during the night times by light and scuba equipment- replaced dynamiting (ANNEX 26).

Illegal fishing can be categorized into 5 groups; illegal trawling, illegal purse-seining, illegal spear-fishing, illegal encircling gillnet and trammel net and illegal line fishing.

Illegal fishing with spearfishing is practiced by divers generally by the help of a underwater torch in nights. Cooperative authorities report that approximately 2.5 tons of groupers, 1 ton of *Dentex dentex*, 1.5-2 tons of *Dicentrarchus labrax* is caught by this way in one season with their professional judgement. It is learned through the reports of cooperative authorities that the amount of illegally caught **white grouper** *Epinephelus aeneus*, *E. alexandrinus*, *Epinephelus guaza*, *Dentex dentex* and *Dicentrarchus labrax* is larger than the cooperative's annual catch of these species. (C. Gorgun, pers. comm.) (Figure 22).

Some primitive and prefabricate constructions were observed in Balıkaşıran bay and vicinity (H33-H32). These prefabricate constructions are built by the local small scale fishermen in order to facilitate their fishing activities. Some of these activities is supposed to include illegal fishing techniques mainly fish traps and spear fishing.(G33,H32,H33). In Kamilkırığı (Çiçekli Cove) a group of people are observed suspected to carry out illegal fishing activities which is supported by the equipment including small boats with outboard engines and fish traps and breads with huge quantities.

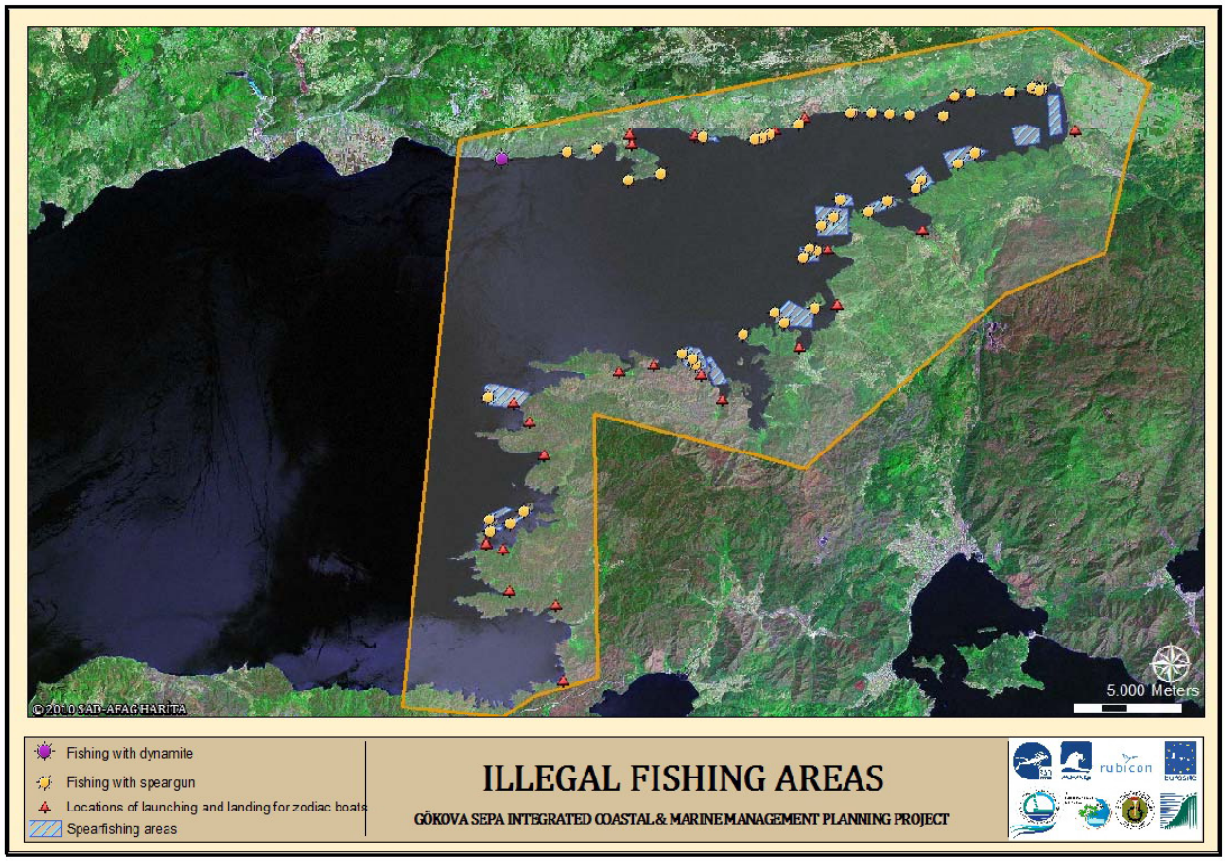

Figure 22 Illegal fishing areas

1.3.1.4. Waste water / Sewage

There is no sewage system in Akçapınar, Gökçe, Çetibeli, Çamlık, Taşbükü, Bucakalanı, Akbük and Turnalı Villages. In Akyaka and Gökova towns and vicinities canalization sewage system partly functions and connected to the main sewage system in 60% and 30% respectively (ANNEX 27).

1.3.1.5. Solid waste/Illegal dumping sites

Solid waste is dumped in the Gökova Riverbed and Çıtlık Riverbed and litters wide parts of the delta along the riverbed/ Gözbaşı Canal (ANNEX 27)..

Akbük bay has problems with solid waste during summer months. And also the coastal road is a favourite for daily tourism, not only to reach Akbük but to make picnics and spend the day. Every kind of waste is just left wherever fancied. Long Delta Beach between Akyaka and Gökçe is a real dump by now. Especially the more traditionally orientated and less well off population prefers the long beach. Many people can not swim and use the shallow delta beach for

paddling. Rubbish is left and not collected any longer. Çetibeli Riverbed south of the Muğla-Marmaris road is partially used for waste disposal by the adjacent settlements.

Despite these, there are have agricultural chemicals and run off in Turnalı bay and vicinity and delta plain between Akyaka and Gökçe.

Increased use of the plains for agriculture has lead to increased drainage activities and related harm to the habitats and the whole system. By osmotic pressure water drains from the wild wetland into the drainage canals of the agriculture spaces, leading to the wetland being drained earlier and falling dry at times and spaces, where it should stay wet for a longer time to function properly. The problem particularly occurs in Gökova and Gökçe Delta plains.

Illegal water withdrawal not only from underground water through ground wells, but directly from the aquifer by artesian wells, where possible. Our research showed that farmers and villagers have over 100 illegally bored wells in the Gökova plain alone. Uncontrolled and illegal water withdrawal leads to wetland and other habitat degradation, saltification and desertification. The problem also occurs in Gökçe Village and Çamlı Village.

1.3.1.6. Oily Waste Reception Facilities on Selected Coasts and Coastal Facilities

Oily waste reception facilities should be included in the integrated management planning of Gökova SEPA. Based on the field studies, the need for PRFs have been produced and it was concluded that 4 PRFs should be constructed and operated Akbük, Akyaka, Çamlı and Okluk Bays (Figure 23).

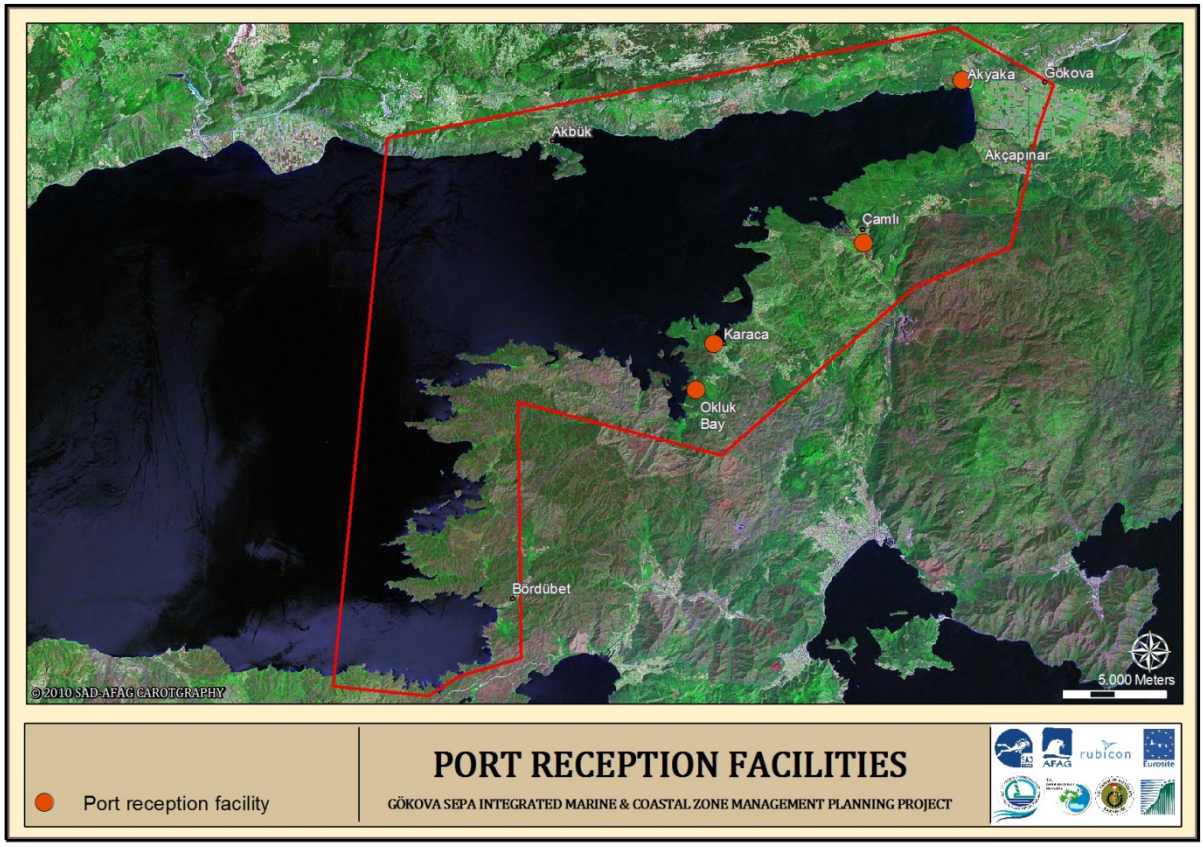

Figure 23 Proposed port reception facilities

1.3.1.7. Human Disturbance and Tourism Pressure in the Wild Habitats

Most extensive measures of human disturbance on the research area are observed in wet lands and by riverside. Thus in this report there need to put emphasis on this threat is evaluated to be specific.

The small wetlands in Akbük and Çınar are on the edge of a beach area, used for tourism. They are both under threat of drainage to make space for development. Both are frequented by Eurasian Fishotters (*Lutra lutra*), two species of turtles *Mauremis caspica rivulata* and river tortoise *Emys orbicularis* and diverse waterfowl species.The riverine and adjacent wetland habitat has been already heavily degraded by tourism in Akyaka (ANNEX 28).

The local biodiversity consultant Bahar Suseven's final technical report focusing on threats and risks is presented in ANNEX 29.

1.3.1.8. Illegal forest harvesting and reed cutting

Illegal lumbering and shrub cutting occur in Gökova, mainly along the Gözbaşı Canal and in the Tamarisk Belt and in Çetibeli Village & vicinity along the river in the Liquidambar Cove and in Çamlı Village along the Gelibolu river (ANNEX 30).

1.3.2 Identifying pressure on coasts caused by coastal constructions and housing development

1.3.2.1. Land filling

Habitat destruction and construction activities occurred in and Gökova Plain. (http://www.sadafag.org/english/index.php?bolum=haber&id=191).

Local consultant Bahar Suseven reported that Illegal landfill occurs in Hayıtlı cove in the last 5 years, Akyaka Azmak riverside in the last 10 years and in Gökçe Village in the recent years.

1.3.2.2. Building construction

Taşbükü Bay is a pristine coastal area located between Çamlı and Boncuk Bays in the southern coasts of Gökova SEPA. Photos taken in the area show massive construction activities conducted in the area. SAD will get in contact with the governmental agencies about this construction activities (ANNEX 31).

(http://www.sadafag.org/gokova/english/index.php?bolum=haber&id=190)

1.3.2.3. New road opening

Between Gökova and Akbük the research team observed construction of roads by governmental bodies. These new roads observed to cause erosion of coast line surface soil. The natural material extracted is observed to be rolled down directly on coast line habitats in some certain localities. Hundreds of pine trees observed to be cut and present coast line road width observed to be widened. Coast line construction by the Turkish coast lines is concluded to be the most major threat on coast line habitats in many cases. There seems that there is a big deal of lack of coordination in between EPASA and relevant responsible governmental bodies on the management of Gökova Bay coast lines. Most of the time road construction is irreversible

process that triggers other plastic deformation which ends up by habitat fragmentation. In our zoning and action plan precautions and measures to manage irreversible decisions are considered accordingly. Level of threat is assessed within corrolated data assessment. In Figure 24 intensity of road versus coast lenght is corrolated and we believe that the level of threat is presented in a clear and easy understanding manner.

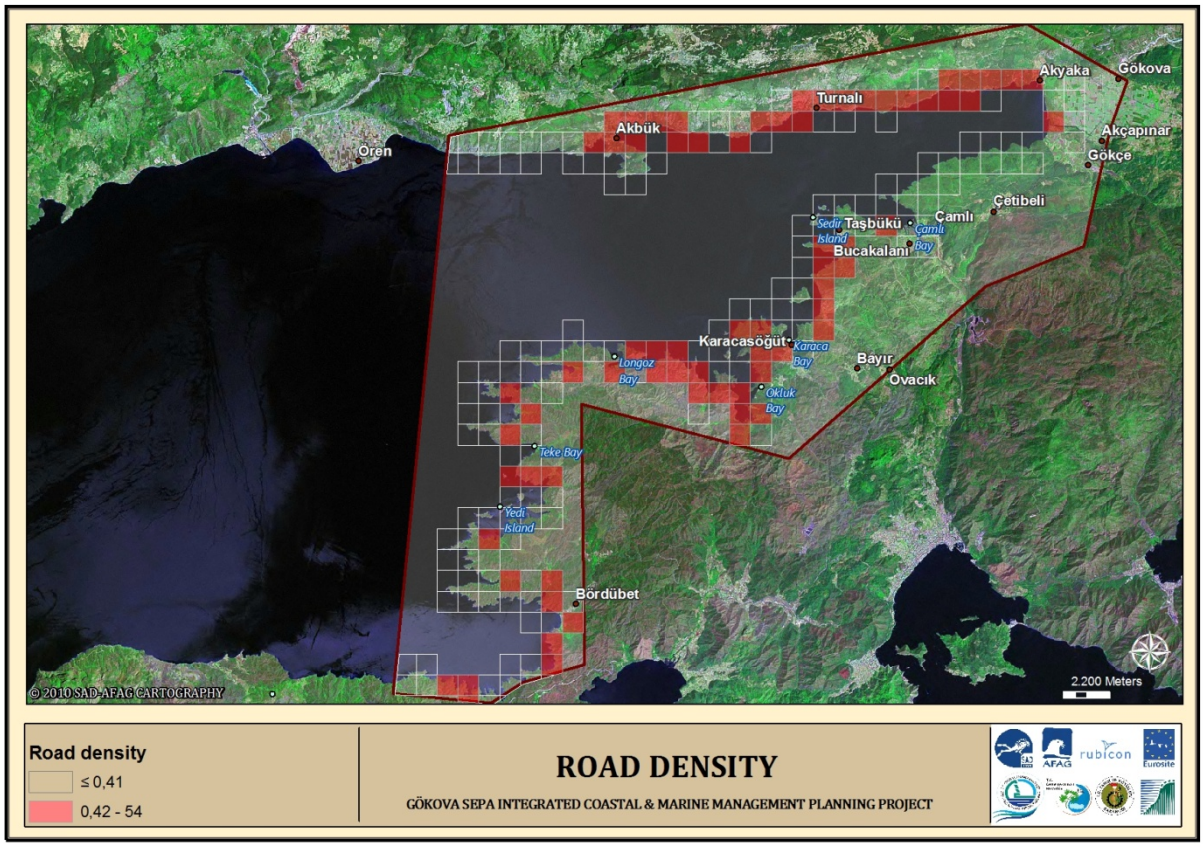

Figure 24 Road density of Gökova SEPA

1.3.3 Marine pollution measured and analyzed in certain stations

Marine pollution samples were collected from 11 discrete stations (Table 7) by Alka Çevre Laboratuvarları (Alka Environmental Laboratory), a company working for EPASA as well. The oil and grease values were measured from the samples collected three times in April, August and September 2010 (ANNEX 32). And EPASA shared previous measurement results taking from 11 sample points, including total coliform, fecal coliform, pH, dissolved oxygen and light transmittance values belonging to 2007, 2008 and 2009 years as well as first 9 months of 2010 (EPASA letter dated 29.09.2010).

Table 7 Oil and grease values of Gökova SEPA

No	Location	April	Agust	September
1	AKYAKA PORT AREA	1,4	1,8	0,0
2	AKYAKA AZMAK	1,0	2,4	2,4
3	AKYAKA BEACH AREA	1,8	2,6	2,4
4	KARACASÖĞÜT PORT AREA	1,2	1,8	1,4
5	ÇAMLI BAY	1,0	3,6	0,2
6	İNGİLİZ COVE	1,6	1,6	0,4
7	KÜFRE COVE (TUZLA BAY)	1,0	3,0	3,6
8	AKBÜK COVE	0,8	6,4	1,0
9	KARACASÖĞÜT COVE	1,2	0,8	0,4
10	ÇINAR BEACH	2,0	2,4	2,2
11	SEDİR ISLAND	0,8	1,4	0,6

During several occasions visual marine pollution have been observed and recorded with cameras. During habitat classification studies held in May 2010 along northern coasts of Gökova EPASA, an obvious pollution has been observed and recorded with digital cameras near Akbük.

Coastal pollution in terms of solid debris is observed at certain selected locations within Gökova SEPA especially Gökova plain, Çamlı wetland, Balıkaşıran coasts, Çatı Cove and Bördübet coasts. The southern border and vicinity of Gökova SEPA seem to be the places which suffer coastal pollution most. In September 2010 and May 2010 all the coasts were photographed and the solid waste pollution on the above mentioned coasts were documented with high quality photos.

According to the oil pollution measurement values Çamlı, Akbük and Tuzla Bays are under pressure of pollution due to oily waste discharges from the marine vessels including daily tour boats, private yachts and charter yachts.

1.3.4 Marine traffic

Relevant data on number of boats and their distribution were asked to local people from specified bays and locations during the summer period in 2009. Unfortunately this data collection method did not work because of local contacts could not send data periodically to the project office. And also in some bays there was no settlement, which means no local contact, but yachters use regularly. Thus it is decided to take aerial photographs of the project area in the most crowded period in two times a day, mid of day (to assess the daily tour boats' activities) and end of the day before sunset (to assess the yachters' activities). Data of mooring locations and routes were also collected during the other field studies such as Mediterranean Monk seal and posidonia surveys and coastal habitat classification. Although the first microlite flight attempt was successful for photography, an unfortunate accident happened during takeoff when the 2nd attempt was made in Gökova plain on September 2010. Therefore, the project team decided to halt microlite flights and considered boat counts and distribution determination studies by using high speed marine craft (ANNEX 33).

In 8th and 9th September 2010, Serpil Kozludere and Cem O. Kıraç have carried out a boat & yacht counting surveys by means of a high speed boat in whole Gökova SEPA marine & coastal areas except Akbük and Akyaka zones where Volkan Hürsever and Bahar Suseven separately (and simultaneously) performed the same job respectively. The general distribution and number of boats & yachts were recorded by these count studies with 30 to 40 knots per hour. Meanwhile digital photos of each cove or bay together with the boats have been taken for analysis and reporting. The result of the study is presented in ANNEX 34. Referring to inquiries on the intensity of yacht usage and traffic the highest rate of intensity is seen by midsummer (July and august) season. The rate of deviation indicates a clear need of interpolation with the current data in hand. In the high season the boat count results are concluded to be 2-3 times higher in number.

Marine traffic assessment mooring of yachts and gullets are generally done on to the pines very near to the coasts, which result in eventual destruction of the trees.

Intensity of marine traffic is observed specifically by coves and islands sustaining touristic services. It is observed that Akbük, Çamlı, Sedir Islands, Karaca, Okluk, Longöz, Tuzla, Yediadalar, Bördübet Coves are subject to marine traffic need to be managed by navigational planning. Throughout the project communication and evaluations with UMA (Responsible for Maritime Affairs) is still an ongoing process.

Buoys and land anchors system should be developed for Gökova SEPA as has been done for Göcek bays in fethiye-Göcek SEPA. The locations for such system are; Akbük, Okluk, Longoz, Tuzla, Yediadalar, Amazon & Bördübet, Çatı Bays and Sedir Island (Figure 25).

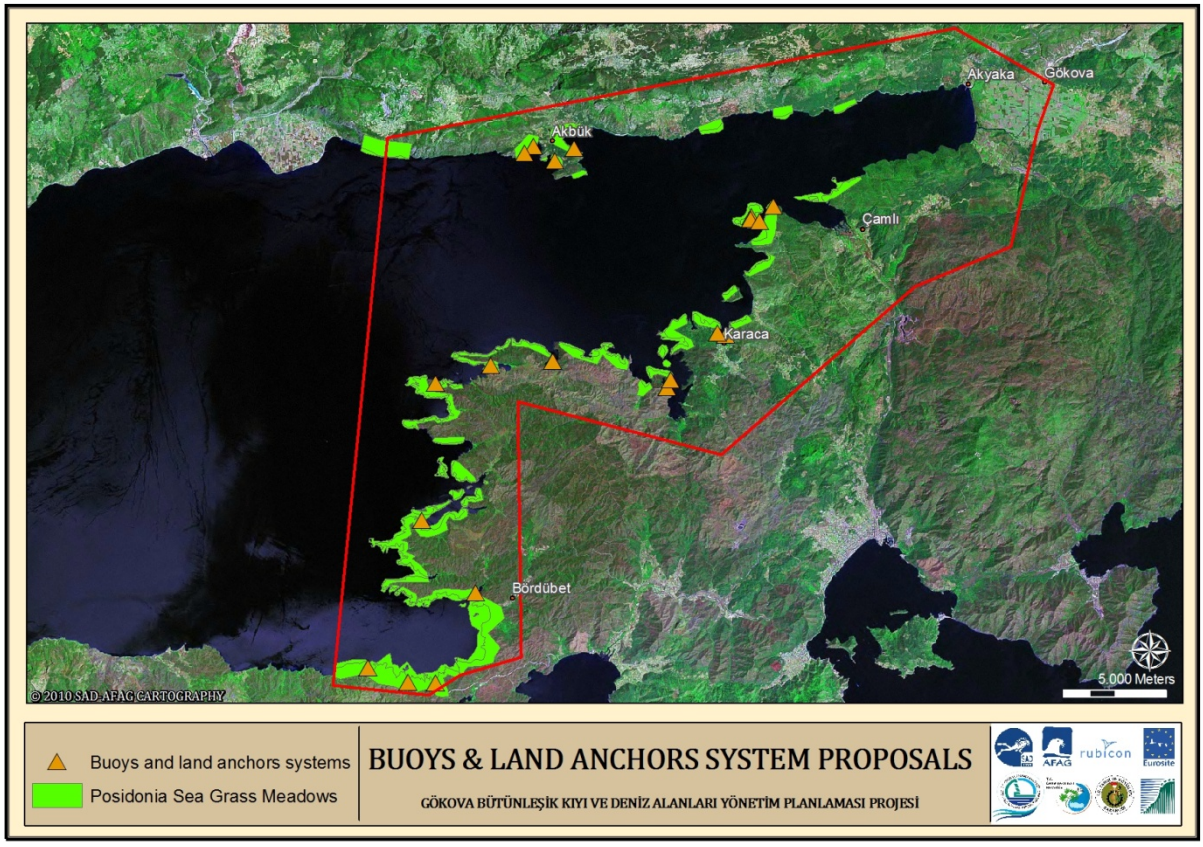

Figure 25 Proposed anchoring systems and locations

1.3.4.1 Insufficient boat shelter and maintenance facilities

Referring to number of boats and marine traffic data adequate and qualified shelter and maintenance facilities are proposed in the plan. Locations, quantity and capacity of boat yards are presented in Figure 26 and Table 8

Table 8 Boat yard capacity and qualifications

Location	Capacity	Total Area (m^2)
Akbük	10	800
Bördübet	15	1200
Çamlı	20	3000
Akçapınar	15	1200

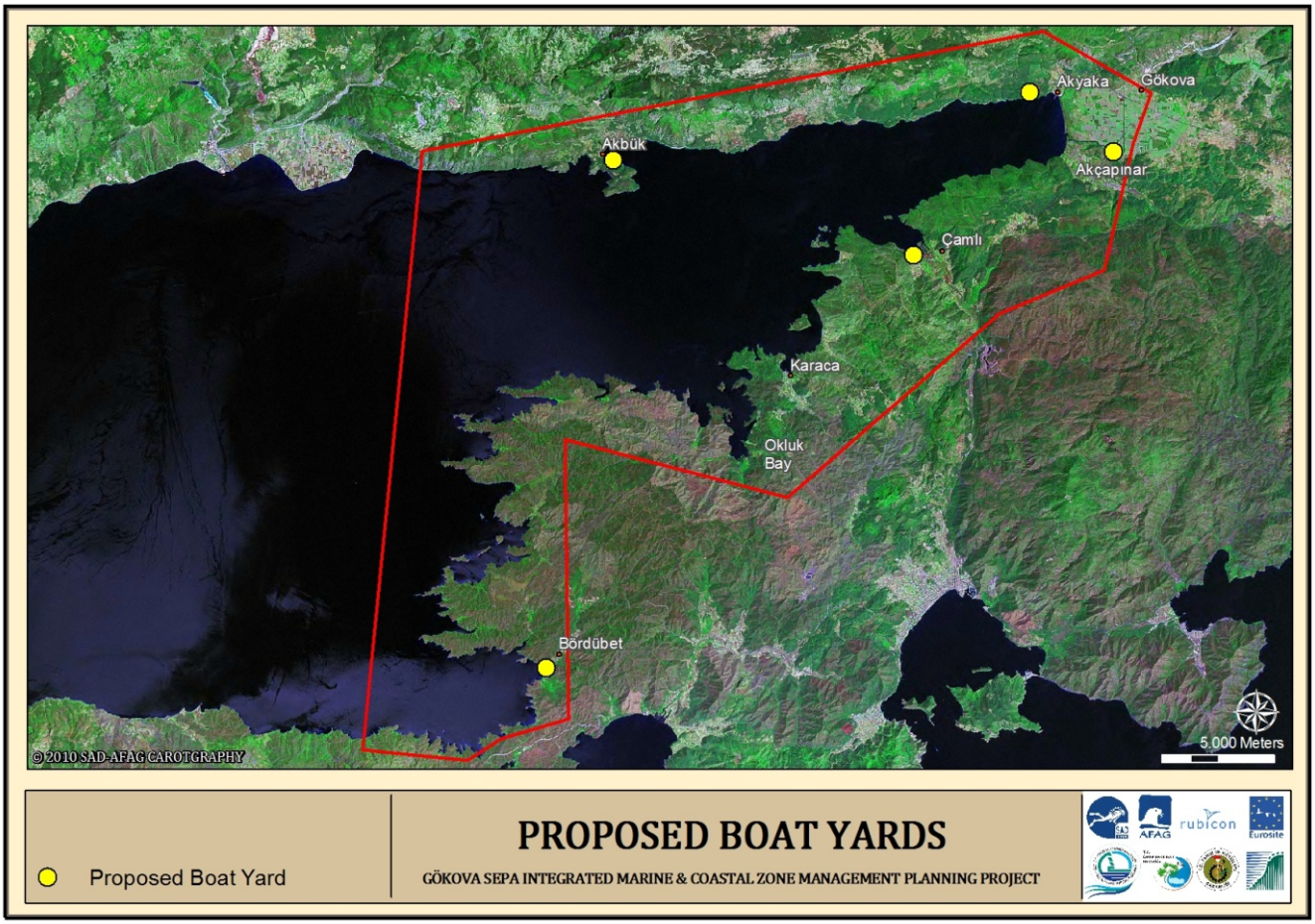

Figure 26 Proposed boat yards

1.3.5 Underwater and surface photography and documentation

Component consultant Zafer Kızılkaya took photos underwater in the first year of the project (http://www.sadafag.org/gokova/index.php?bolum=galeriler&kategori=12) (ANNEX 35).He also flew with a microlite to take aerial photos to assess the marine traffic in 21 August 2010. (ANNEX 33). In addition Serpil Kozludere, N. Ozan Veryeri, Semiha Demirbaş Çağlayan, Assist. Prof. Vahdet Ünal and Cem O. Kıraç have taken over 5000 photos during field surveys on monk seal, avifauna, coastal habitat classification and boat & yacht counts as well as socio-economic life, threats on ecosystem and environmental problems within Gökova SEPA.

1.3.6 Overall threat assessment

During studies in the field it is noticed that many remote coves in the area has access through dirt roads and it was witnessed that these roads facilitate illegal night time speargun fishing which is considered one of the fisheries related problems in the area.

Analysis of the threat status of fishes indicated that 15% of the fauna are listed under categories of IUCN. The most important causes of threat for Mediterranean species are quite well known, as listed below:

- Habitat loss and degradation,
- Marine pollution,
- Overfishing, illegal fishing, by-catch and discard,
- Mass tourism and coastal constructions.

Each of the items above may give harm at the species/ecosystem level, but to be much clear, “combination” of these factors are the main threat for the marine environment. Skin dives carried out in the present study were limited to shallow waters, which is the most sensitive area to anthropogenic factors. Litter was present at all localities, with a tendency to increase at semi-enclosed inlets preferred by daily tour boats, yachts etc. Several coastal establishments (hotels, camping facilities etc.) lack essential wastewater treatment facilities, which can easily create impact on food web dynamics (due to rapid changes in nitrogen and phosphorus values) and lead to eutrophication. Threats versus targets are presented in an algorithm in Table 9.

Table 9 Threats versus targets matrix (relative grading)

	Co-efficient of threat	Med. monk seal	Sandbar Shark	Posidonia sea-grass	Commercial Fish Species	Marine birds	Natural coast line habitats	Wetlands	Raptors
Illegal and overfishing	3	High	High	Low	High	Medium	Low	Medium	Medium
Anchoring	1	Low	Medium	High	Medium	Low	0	Low	0
Marine traffic and intensity	1	High	Medium	Low	Low	High	Low	High	Low
Marine and coastline pollution	1	Medium	Medium	Medium	High	High	Medium	Medium	Medium
Poaching at wetlands	1	0	0	0	0	Low	Low	Medium	High
Unsustainable agricultural land and water use practices	2	Low	Low	Low	Medium	Low	Medium	High	Low
Insufficient unplanned boat maintenance and shelter location	1	Medium	Medium	Low	Low	Medium	Medium	Medium	Medium
Uncontrolled tourism and human activites by the coastline, islands, islets and marine ecosystem	2	High	High	Medium	High	High	High	High	High
Coastline habitat destruction	1	High	High	Low	Low	High	High	Low	High
Wet land habitat destruction	1	Low	Low	0	Medium	Medium	High	High	High
Magnitute of effect		High	High	Medium	High	High	Medium	High	Medium

ACTIVITY 2. INFORMATION ABOUT THE IMPORTANCE OF GÖKOVA BAY SEPA AND ITS MANAGEMENT PLAN ARE AVAILABLE TO THE SPECIFIC TARGET AUDIENCES

2.1 Media campaign

Gökova ICMM project was appeared in the press under the different media categories as follows (total 25 times);

- National newspaper (6)
- Regional newspaper (9)
- National radio programs (2)
- Regional radio program (1)
- International magazine (1)
- National magazine (4)
- News agency (1)
- Bulletin (1)

The list of above mentioned outputs appeared in the media is given in ANNEX 36.

And also a poster and 3 separate leaflets and a poster, which include information about the project, the biodiversity and the proposed decions for the management plan, were designed and printed to be distributed to the local people and other relevant stakeholders in Gökova SEPA region (ANNEX 37).

T-shirts were specially designed and produced for artisanal fishermen of Gökova SEPA, which were distributed to all artisanal fishermen through fishery cooperatives at the end of the project (ANNEX 38).

2.2 Web page design

Web page (www.sadafag.org/gokova) (ANNEX 39) was designed in the first term of the project. The latest news and notifications were kept up to date. All documents and related information are uploaded for public use. Some statistics are below;

The visitor count for last 1 month: 1 000

The displayed page count for 1 month: 3 000

Average visitor number since the page developed: 1 000

The sum of displayed page count since the page developed: 80 000

The total visitor count: 23 559

The visitor country count: 101

ACTIVITY 3. DATABASE DESIGN

Firstly the general layers such as roads, terrestrial land and marine boundaries, rivers, settlements are digitized from the Quickbird satellite imagery which belongs to the year 2005, which was gathered from EPASA.

SAD GIS specialist Semiha Demirbaş Çağlayan determined the needs of the components and prepared a database in Microsoft Access with SAD GIS supervisor Gökhan Kaboğlu. Database field correspond to the component titles. Data analysis is based on the 1*1 km. grid areas. All inputs are generalized within those grids numbered as A1, A2, A3, etc.

Ecological, social-economic, and threats data were first digitized and then transformed into grid layers for multi criteria evaluation on GIS media.

ACTIVITY 4. ALL OUTPUT AND RELEVANT DATA ENTERED INTO GIS

Semiha Demirbaş Çağlayan exported all relevant data and results from field studies. Geographical information system database structure is presented in ANNEX 40. ArcINFO 9.3 is used for GIS analysis. All maps were produced in this media.

Only Posidonia sea meadows consultant Yalçın Savaş mapped the posidonia data in Manifold GIS Program. Also this map file was exported to relevant database in order to relate the associated layers such as mooring etc.

Bathymetry information is also digitized from MAGELLAN -MapSend Blue Navy programme.

ACTIVITY 5. SHARING GIS PRODUCTS WITH RELATED ORGANIZATIONS AND PUBLIC VIA INTERNET

On 27 July 2010 Cem O. Kıraç, Ozan Veryeri, Serpil Kozludere, Semiha Demirbaş Çağlayan, Eren Özden and Ece Saraoğlu representing SAD project team has a meeting with EPASA officers including Planning Dept., Research Dept. and EPASA Muğla Directorate in SAD office. The agenda of the meeting was determining format of shared data especially findings of the field studies with EPASA. All digitized layers and gathered information from field studies were presented to EPASA members (ANNEX 41).

After this meeting, SAD GIS specialist Semiha Demirbaş Çağlayan visited EPASA planning officers in EPASA for arranging the dataset and attribute tables in accordance with their data formats. All data will be shared with EPASA in terms of their dataset format in November 2010. And some relevant maps and some of outputs were uploaded to the project web site for public usage.

ACTIVITY 6. CAPACITY OF NGO AND LOCAL AUTHORITIES AND EPASA TO WORK TOGETHER AND INVOLVEMENT OF LOCAL POPULATION IMPROVED

6.1 Training of the Trainers (ToT) workshop on Integrated Coastal and Marine Management Planning and Practices

The trainer of the trainers workshop have been taken place in Akyaka between 3rd and 5th October 2009 with attendance from Environment Protection Agency for Special Areas (EPASA), Ministry of Culture and Tourism, Ministry of Environment and Forestry – DG Protection and Control, Ministry of Public Works and Settlement, Coast Guard Command, Gendarmerie Province Headquarters, Akyaka Municipality, Muğla University, Ege University, Undersecretariat for Maritime Affairs, Bodrum Municipality, Agriculture Province Directorate, Province Environment and Forestry Directorate, GAS-Der, Akyaka Town Council, Mediterranean Coast Foundation (Med-Coast) and Chamber of Shipping Bodrum Town Branch. 74 representatives from different stakeholder groups, who have a share on the development and usage of Gökova Integrated Management Plan, attended a series of seminar sessions on 3rd and 4th October (ANNEX 42), 2009, delivered by Prof. Dr. Atila Yücel, Vice Rector of Muğla University, Christian Perrenou from Tour du Valat (TdV, France), Mike Mannaart from EUCC (The Netherlands), Sezer Göktan from EPASA and Prof. Dr. Ahmet Cevdet Yalçıner from METU Coastal and Harbour Research Centre (See ANNEX 40). On 5th October 2010, a site visit has been held to visit Ören, along the coastal road from Akyaka to Ören.

See http://www.sadafag.org/gokova/index.php?bolum=sunumlar for presentations.

6.2 Public meeting(s) on Gökova SPA ICMM planning process held

The SAD Team (steering committee co-chair Prof. Dr. Bülent Akınoğlu, project co-leader Cem O. Kıraç, project manager N. Ozan Veryeri and field studies co-coordinator Dr. Harun Güçlüsoy, project consultant D. Haluk Camuşcuoğlu, project assistant Elif Tertemiz) visited Muğla University, Muğla Governorship, Akyaka Sub-Governorship, Friends of Gökova Akyaka Society (GAS Der.), Gökova Sailing Club and Karacasöğüt Fish Farm at 6th, 7th, 8th February 2009. All visits organized for the aim of introducing the project and obtaining the supports of these organizations supposed to indispensable local stakeholders (ANNEX 43).

On 2nd October 2009, Dr. Vahdet Ünal (fishery management consultant), Zafer Kızılkaya (tourism and documentary consultant) and Derya Yıldırım (marine biologist and SAD member) coordinated a meeting with the local fishermen as part of SAD's "No Fishing Zones in Gökova Bay" project recently funded by UNDP-GEF in 2009. The goal of the meeting was to provide overall status of fishery and marine ecosystem in Gökova Bay. Illegal and /or over fishing (by trawlers and purse seiners and harpooners) affects most coastal fishermen. Related project team members narrated the idea of no fishing zones that can enhance the situation. Also the chairmen of the cooperatives and around 60 fishermen have stated their doubts. After some serious discussions, parties agreed upon the idea of necessity of establishment of small scale NFZs in the project area. Cem O. Kıraç, N. Ozan Veryeri, Dr. Harun Güçlüsoy, Assoc. Prof. Murat Bilecenoğlu, Damien Dessane and Semiha Demirbaş from SAD-AFAG team and Canan Orhun and Umberto Gallo Orsi from RUBICON had observed the meeting. (See ANNEX 44). SAD-AFAG team agreed with local fishermen for a second meeting for determination of locations and sizes of "no fishing zone marine areas" in the region and actually this happened successfully in 6 December 2009 in the occasion of stakeholders meeting that was held between 5 and 8 December 2009.

Stakeholders Problem Analysis meetings have been held in Akyaka and Gökova towns between 5th and 8th December 2009. The content of the assemblies were "Yachting and Daily Boat Excursions Stakeholders Meeting, Fishermen Stakeholders Meeting, Tourism Stakeholders Meeting, Farmer Stakeholders Meeting". Project manager N. Ozan Veryeri and project assistant Eren Özden and local consultant Bahar Suseven coordinated these meetings with contributions of Ayhan Toprak (Biologist from Köyceğiz Directorate of EPASA) and Sezer Göktan (Branch Manager from EPASA, Ankara). Broader participation of local groups with representatives of local NGOs and official bodies has strengthened the aim of the meetings. The general problems are grouped under the title of ecological, socio-economical, administrative problems. The facilitators used problem tree (cognitive mapping) method (ANNEX 45).

Gökova Stakeholders Solution Analysis Meetings are held at 9-10-11 June 2010 in Muğla Province - Akyaka and Gökova. The meetings are performed with active local sectoral groups which are defined as Tourism, Daily Boat Trip, Sailors and Fishermen. Attendants from United

Nations Development Program - Strengthening Protected Area Network of Turkey Catalyzing Sustainability Marine and Coastal Protected Areas Project, Environmental Protection Agency for Special Areas – Environmental Protection, Research, Investigation Department, Muğla Special Environmental Protection Directorate, Coast Guard Command, Gendarmerie General Command and local civil society organizations (GAS-DER and Akyaka City Council) and local stakeholders are participated to the meetings together with the stakeholders, project team and moderators (ANNEX 46).

Gökova Stakeholders final meeting are held at 7-8 October 2010 in Akyaka Yücelen Hotel. The local sectoral participants who were farmers (14), tourism employees (25), fishermen (37), tour boat owners (23) were the main participants of the meeting. In the meetings held sectorwise, the problems detected during the Problem Analysis Meetings and the solutions proposed during the Solution Analysis Meetings were recalled. Then the action plans were presented by the project executers; the authorities/organizations responsible for taking these actions and suggestions for the management plan were discussed together with the stakeholders (ANNEX 47).

ACTIVITY 7. ICMM DESIGNED AND PREPARED IN COLLABORATION WITH EPASA EXPERTS & MANAGERS AND PRESENTED TO EPASA

7.1 Management plan model selection

Project manager Ozan Veryeri discussed about the management plan model. He examined EU Maritime Planning Model, EUROSITE, UNDP, IUCN, UNEP management plan approaches. Open Standard Model which is established and developed by the partnership of AWF, CI, TNC, WCS, WWF, FOS, CCF, EWW and WCPA/IUCN was selected as the MOST OPTİMUM management plan model. The model can be understood easily by administrative bodies, local authorities and NGOs. It is based on local conservation values beside the national and international regulations. It is flexible to evaluate and easy to revise. This selection has been forwarded to EPASA on 14.05.2010 with a written communiqué and a reply letter has been received from the Administration dated 28.06.2010 asking the grounds why Open Standard Model has been chosen by SAD.

SAD explained that, the Open Standards Model was preferred over the other management model options as it is used as a "frame model" by internationally recognized NGO's carrying out studies on nature conservation at an international scale, such as WWF, Foundations of Success and the Nature Conservancy. In many projects executed by these organizations, the Open Standards Model and/or several other versions based on this model have been followed and used as a basis "frame model" for management models (Figure 27).

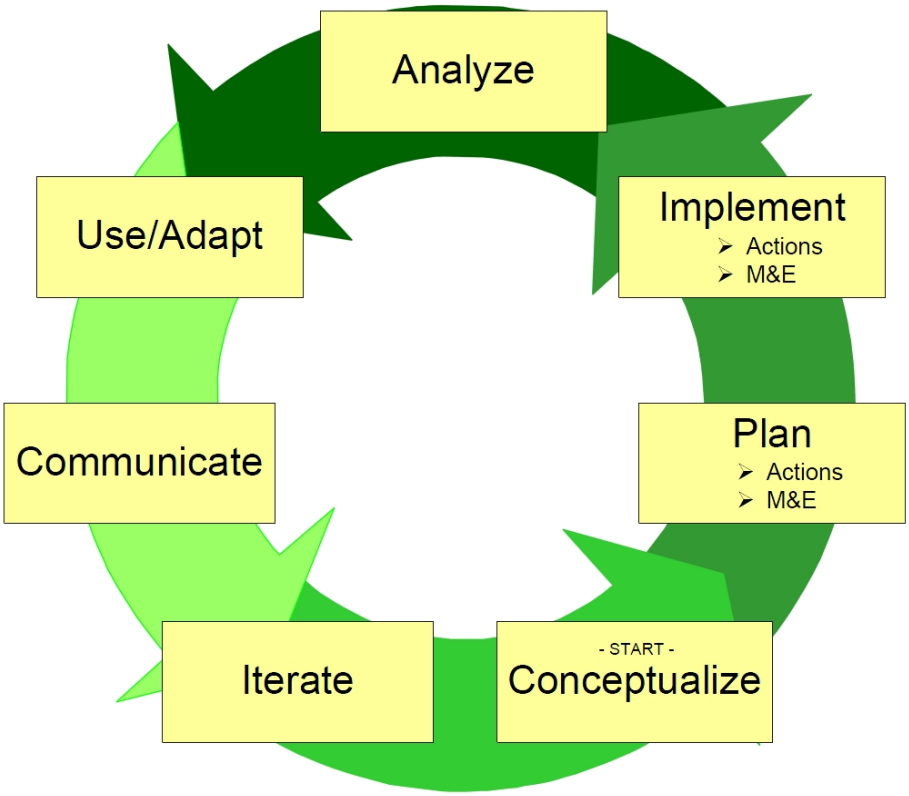

Figure 27 Generalized Project Management Cycle

7.2 Gökova Integrated Coastal & Marine Management Planning

In this report considered main titles are as below.

7.3 Zoning

Referring to Putting PEEN to action objectives there major decisions are given for the management of marine areas. Below given plan decisions are examples of these expansions (Figure 28-40) (Table 10).

Table 10 Target – zoning benefit evaulation

ZONES	TARGETS (KEY SPECIES AND THEIR HABITATS)								
	Mediterranean monk seal	Sandbar Shark	Posidonia sea-grass	Commercial Fish Species	Marine birds	Natural coast line habitats	Wetlands	Raptors	Minimum Total benefit *
Mediterranean monk seal	5	2	3	4	4	5	0	4	27
No take zones	2	4	4	5	4	3	2	2	26
Wet land zones	2	1	1	3	2	5	5	3	22
Scientific research zone	2	5	5	5	4	3	2	2	28
Sandbar shark	1	5	5	5	4	3	0	2	25
Anchoring points	1	1	5	4	2	3	1	1	18
Boat maintance and shelter locations	3	1	2	2	3	5	5	2	23
Recreational areas (kite surf, swimming...)	3	3	2	2	4	4	5	4	27
Islands and islets	2	1	0	0	5	3	0	4	15
Minimum Total benefit **	21	23	27	30	32	34	20	24	

* as added value on present conservation measures
**benefit per target

Referring to data derived out of research studies on the status of targets and threats, measures to be taken for conservation, sustainable management of ecological services and other relevant criteria of management standards below zonings are developed as the main outputs of our project.

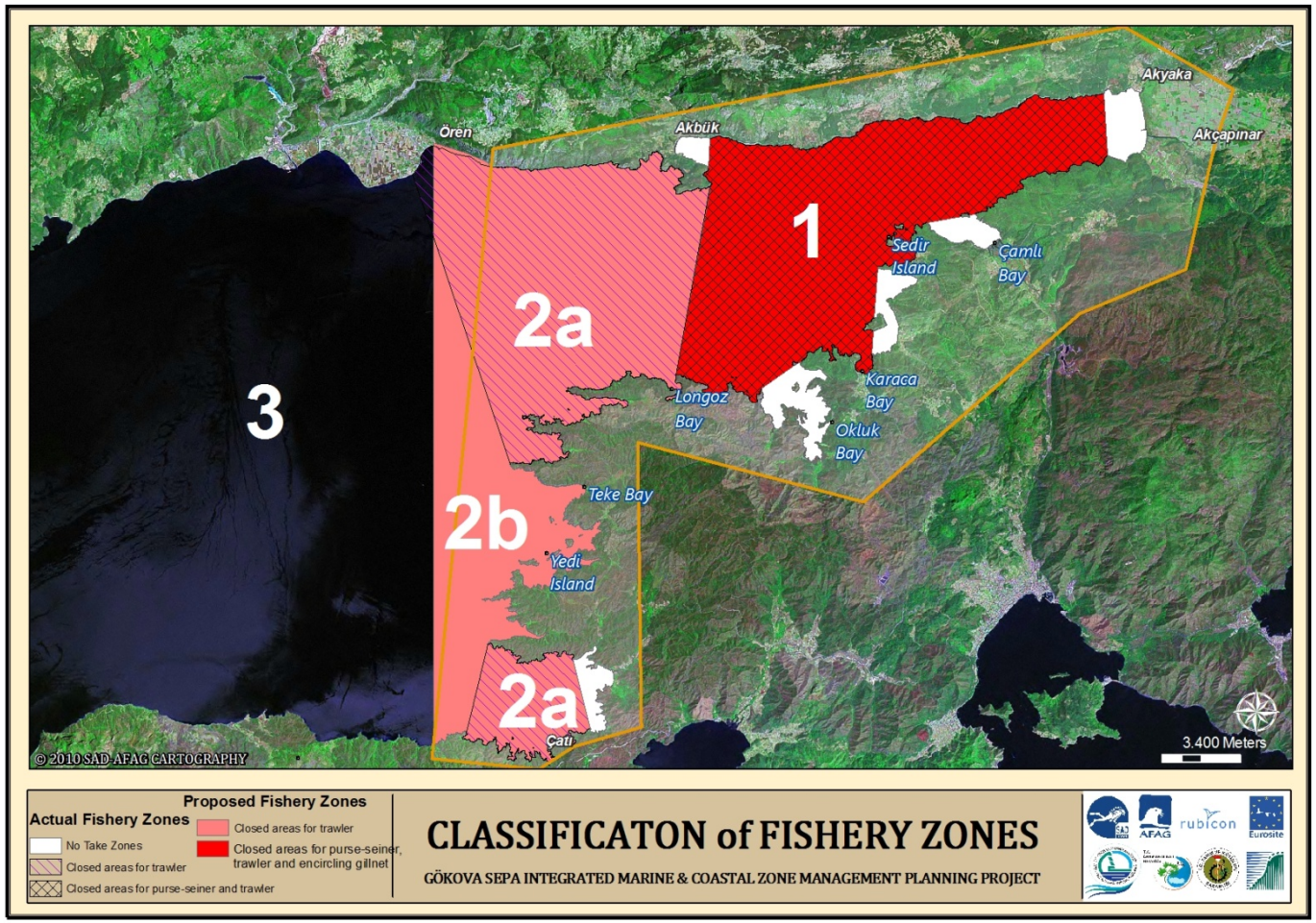

Figure 28 Classification of fishery,
Region 1; Area closed for fishing with purse-seiner and trawler, free for fishing with engine driven encircling gillnet.
Region 2a ; Area closed for fishing with trawler, free for fishing with purse-seiner and engine driven encircling gillnet.
Region 2b; Area free for fishing with purse-seiner, trawler and engine driven encircling gillnet.
Suggested classification
1- Region 1 is closed for fishing with engine driven encircling gillnet.
2- Trawling activity is free in Region 3, but prohibited all year round in the marine area of Special Environmental Protected Area.
3- Spear fishing is prohibited within the boundaries of Gökova marine and wetland area all year round.

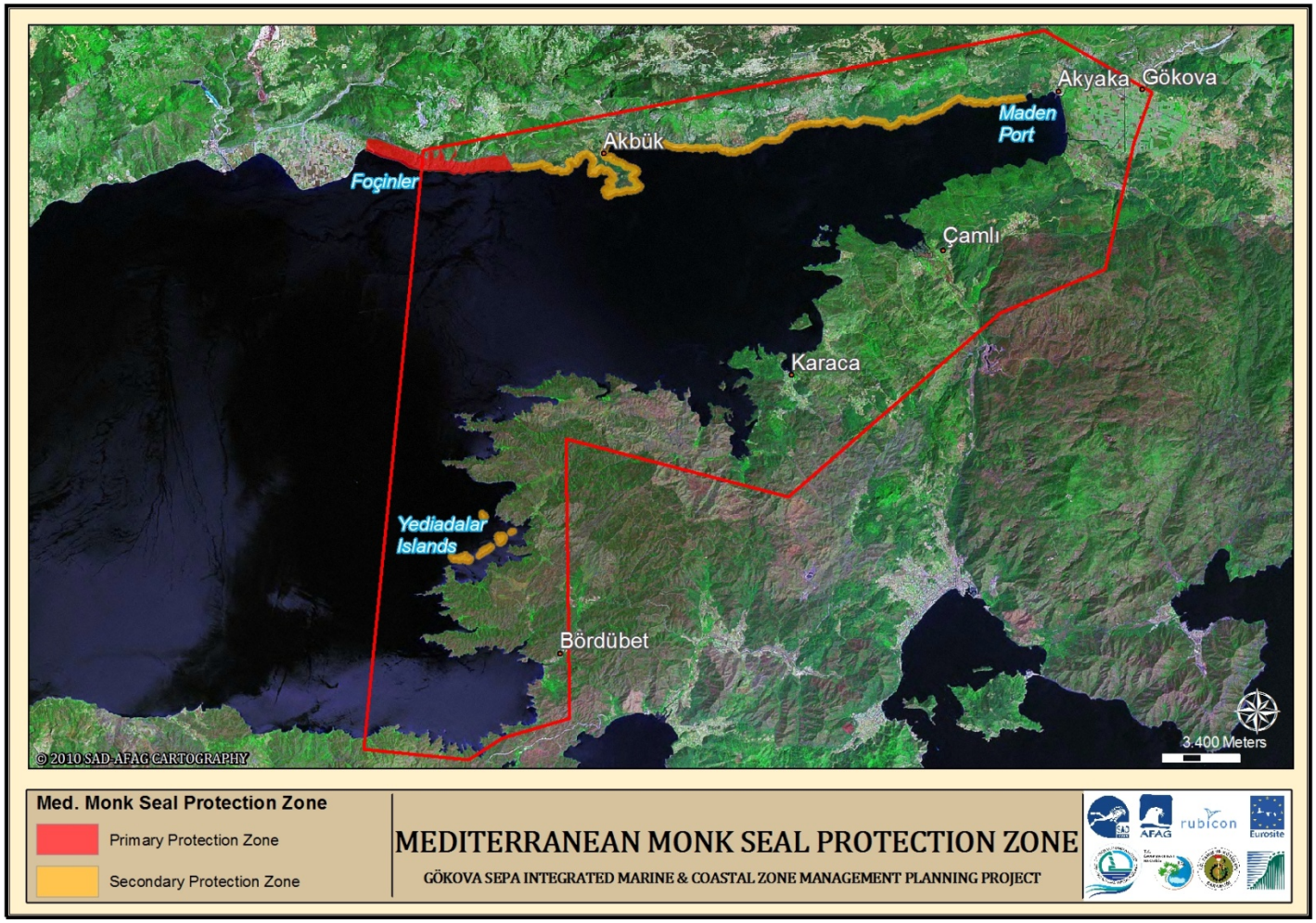

Figure 29 Mediterranean monk seal protection zone

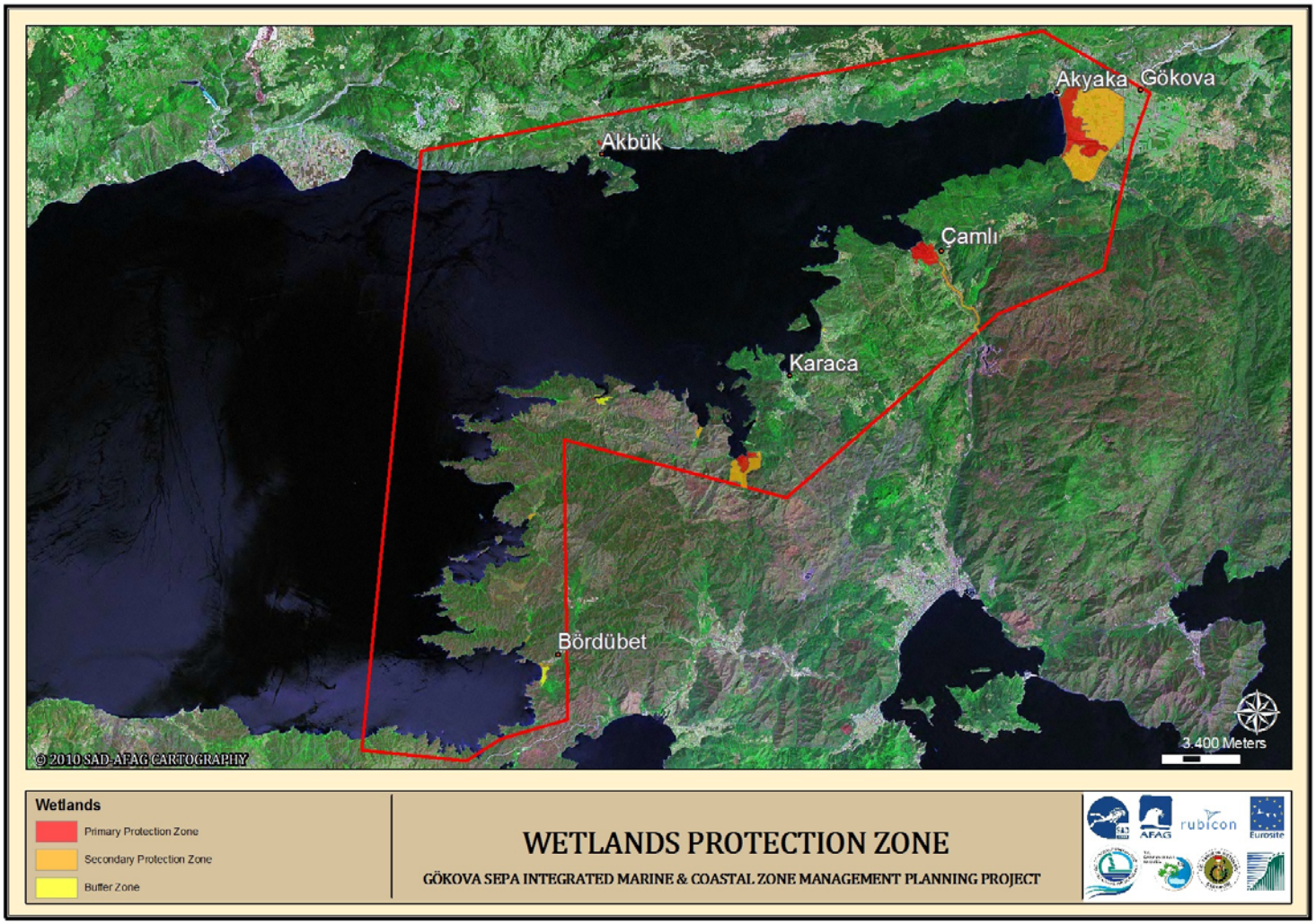

Figure 30 Wetlands protection zone

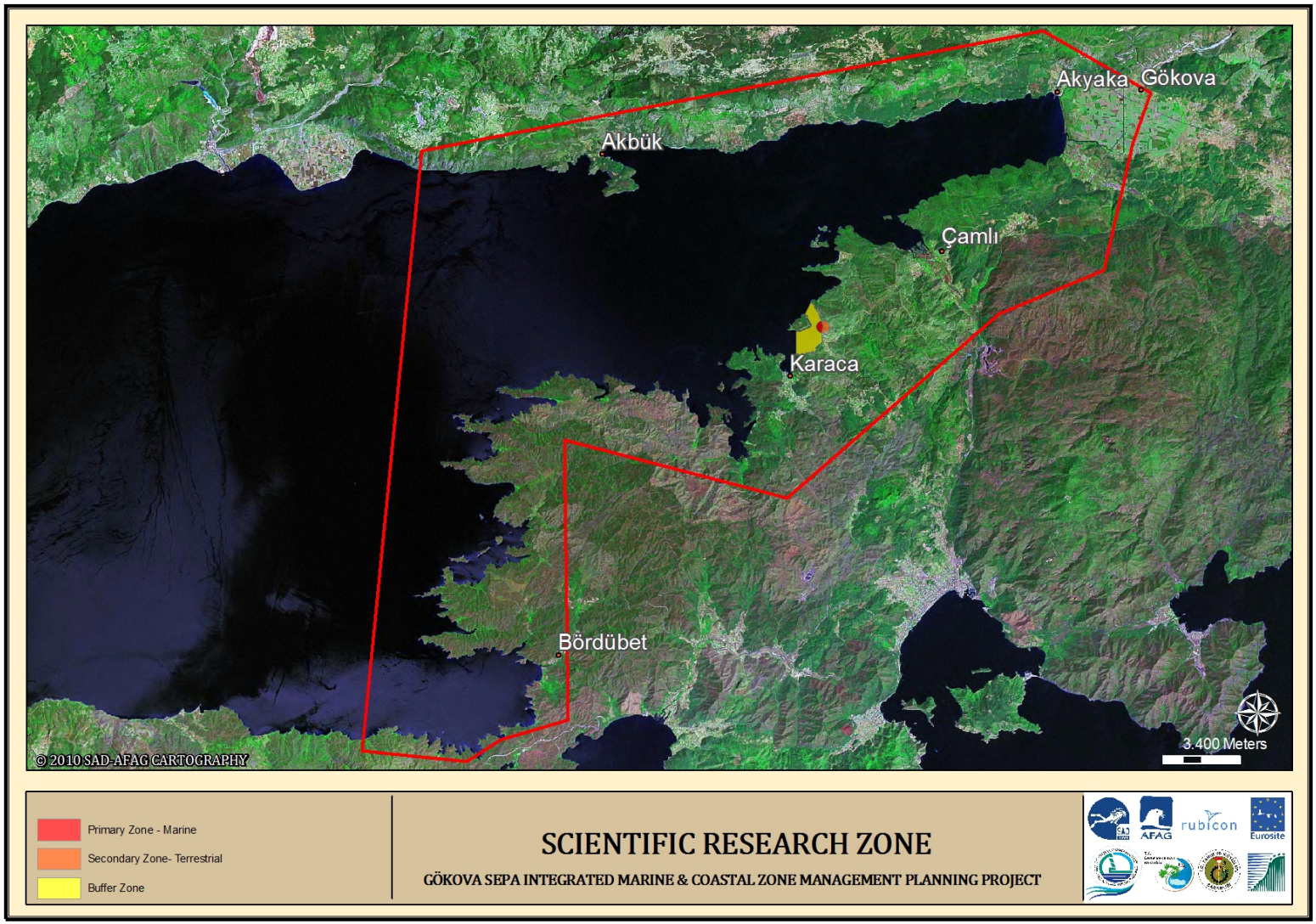

Figure 31 Marine animals rehabilitation center

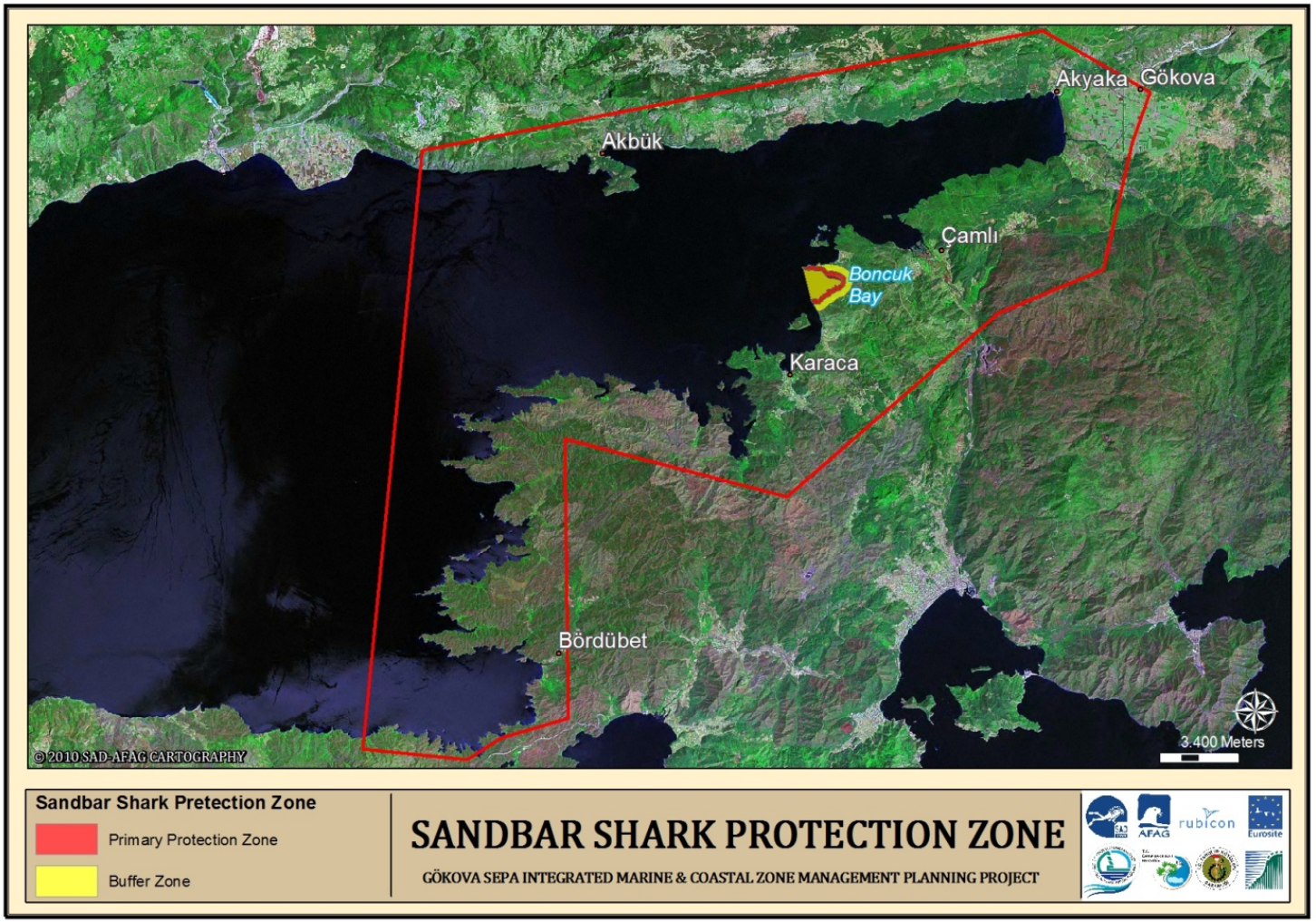

Figure 32 Sandbar shark protection zone

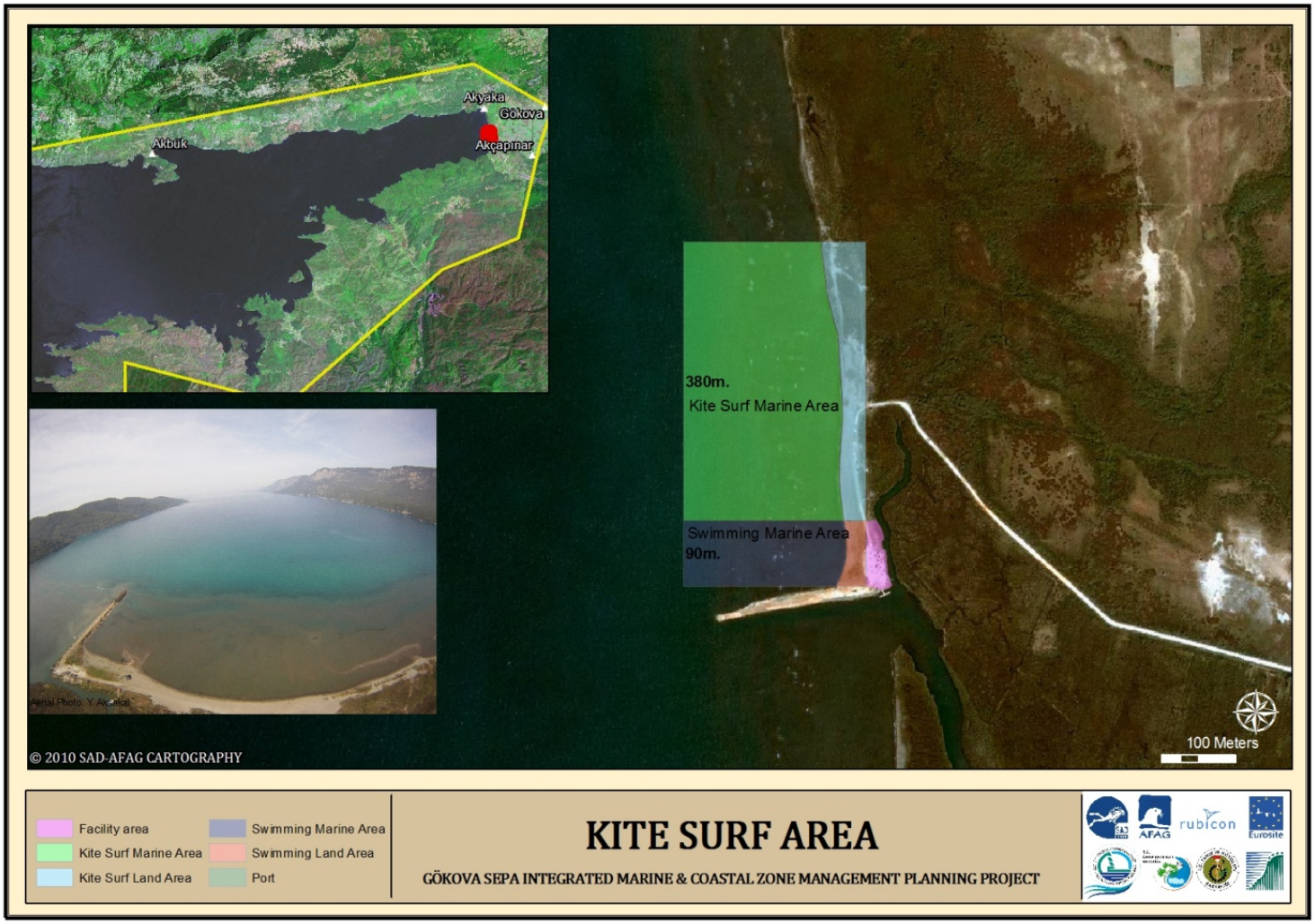

Figure 33 Kite surf area

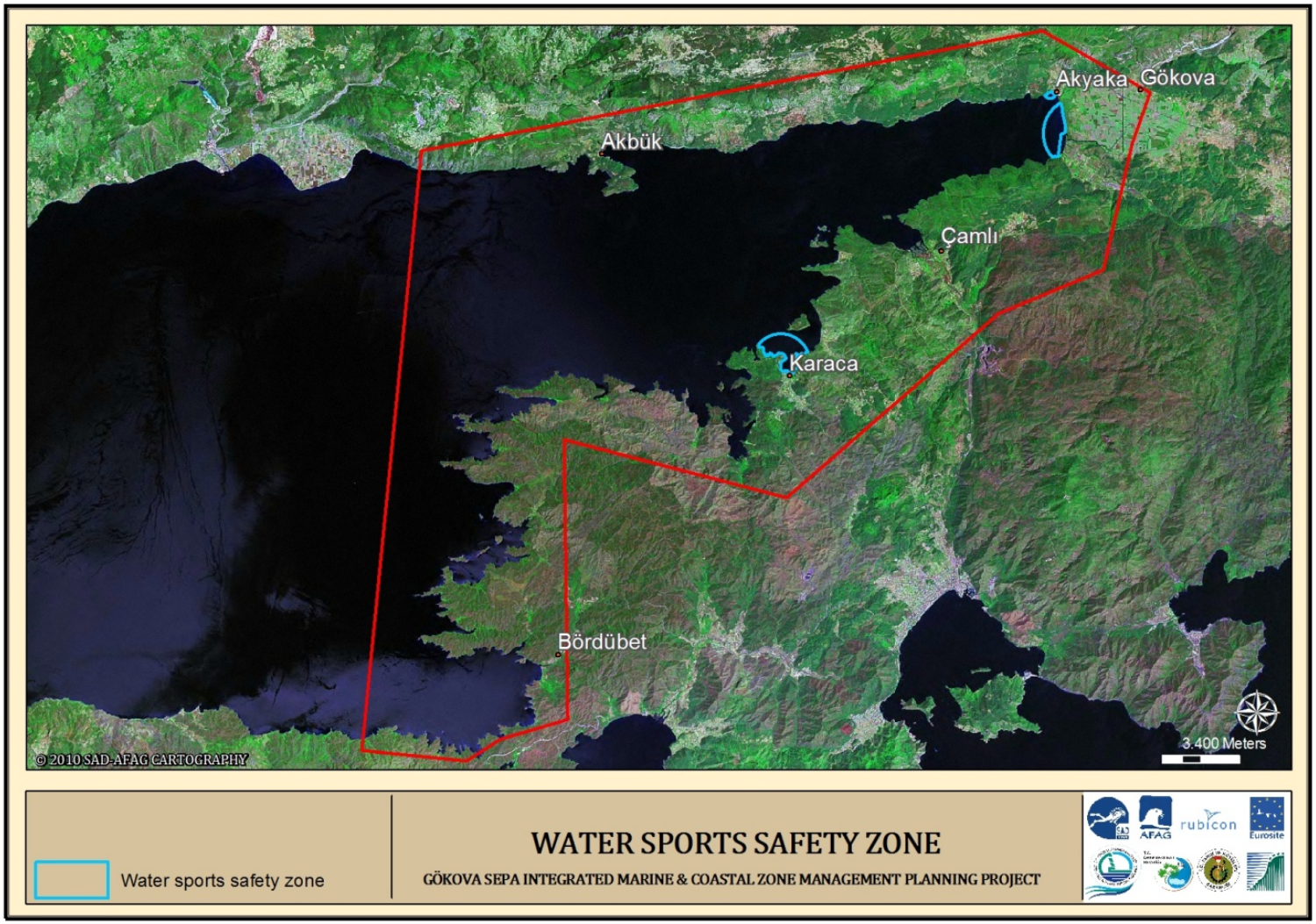

Figure 34 Water sports safety zone

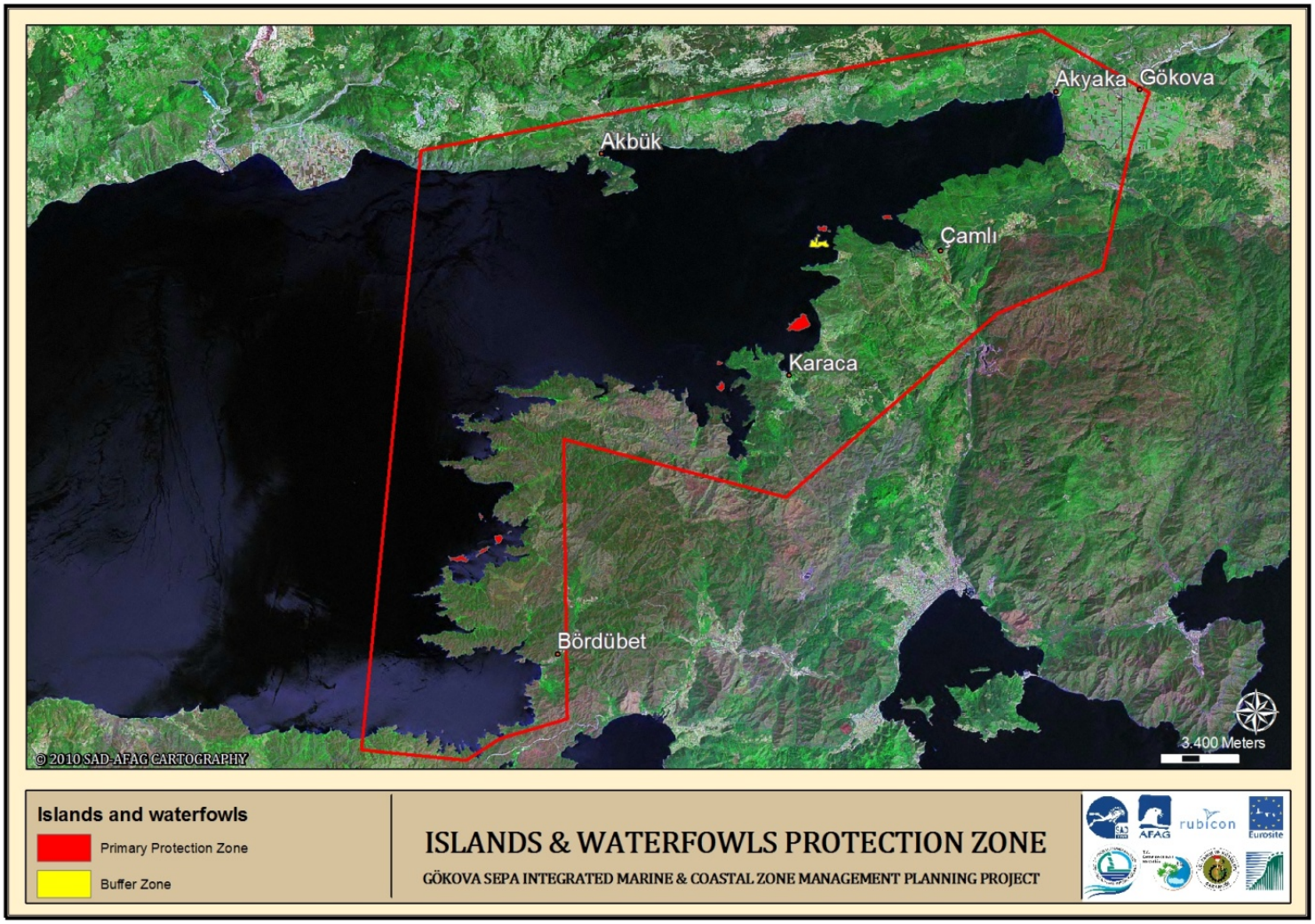

Figure 35 Sea birds protection zone

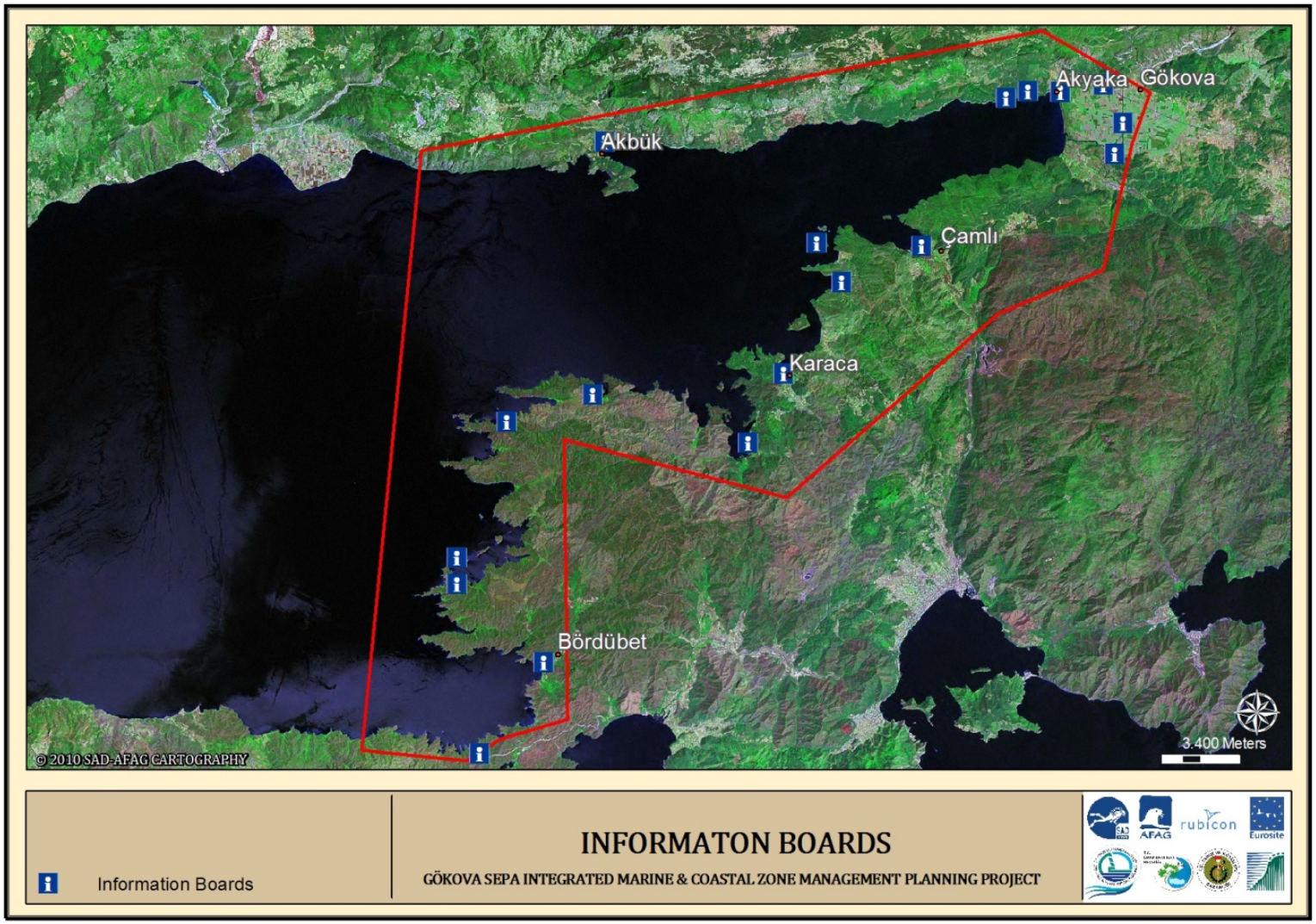

Figure 36 Information boards

Figure 37 Proposed coastal facilities 1

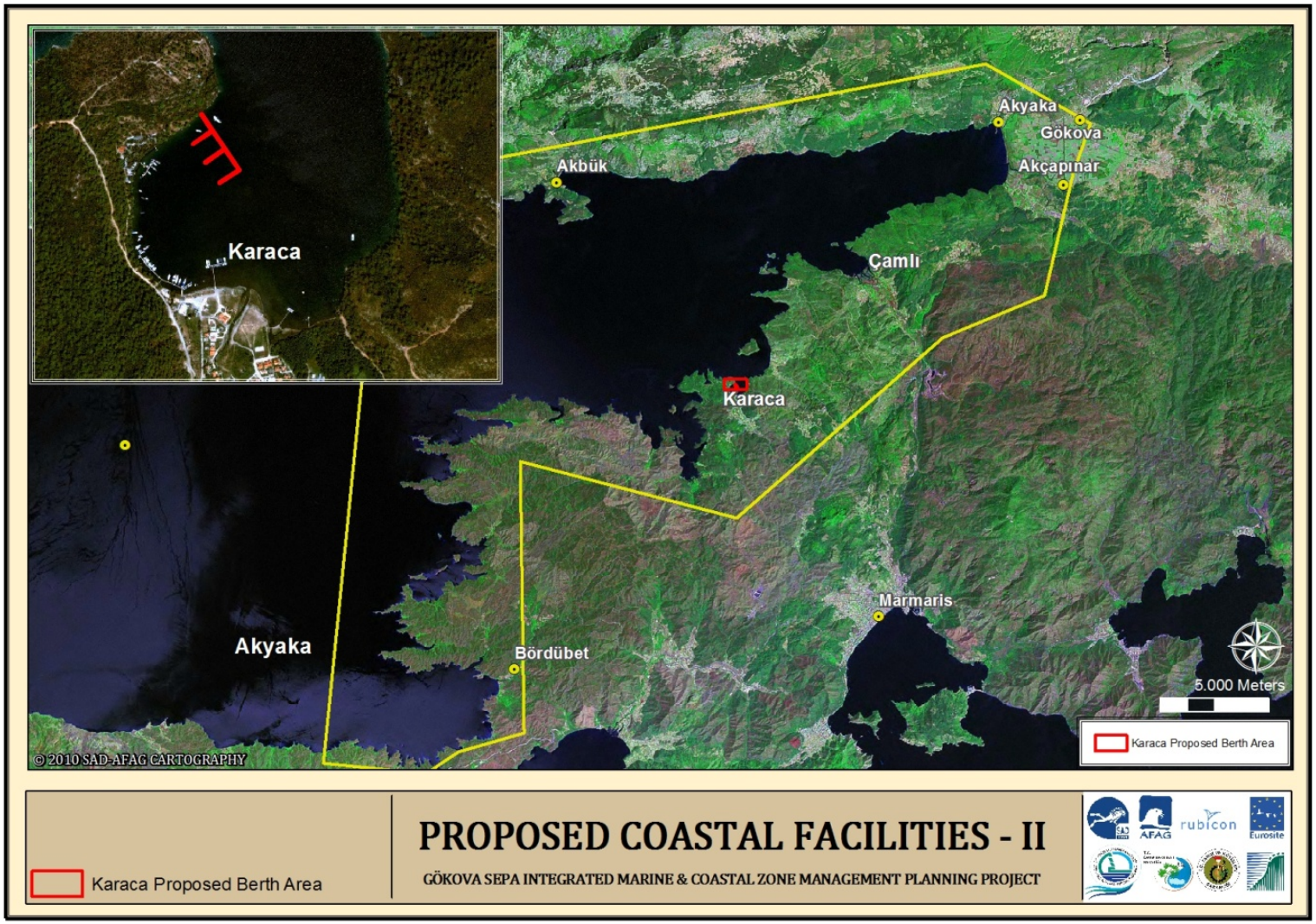

Figure 38 Proposed coastal facilities 2

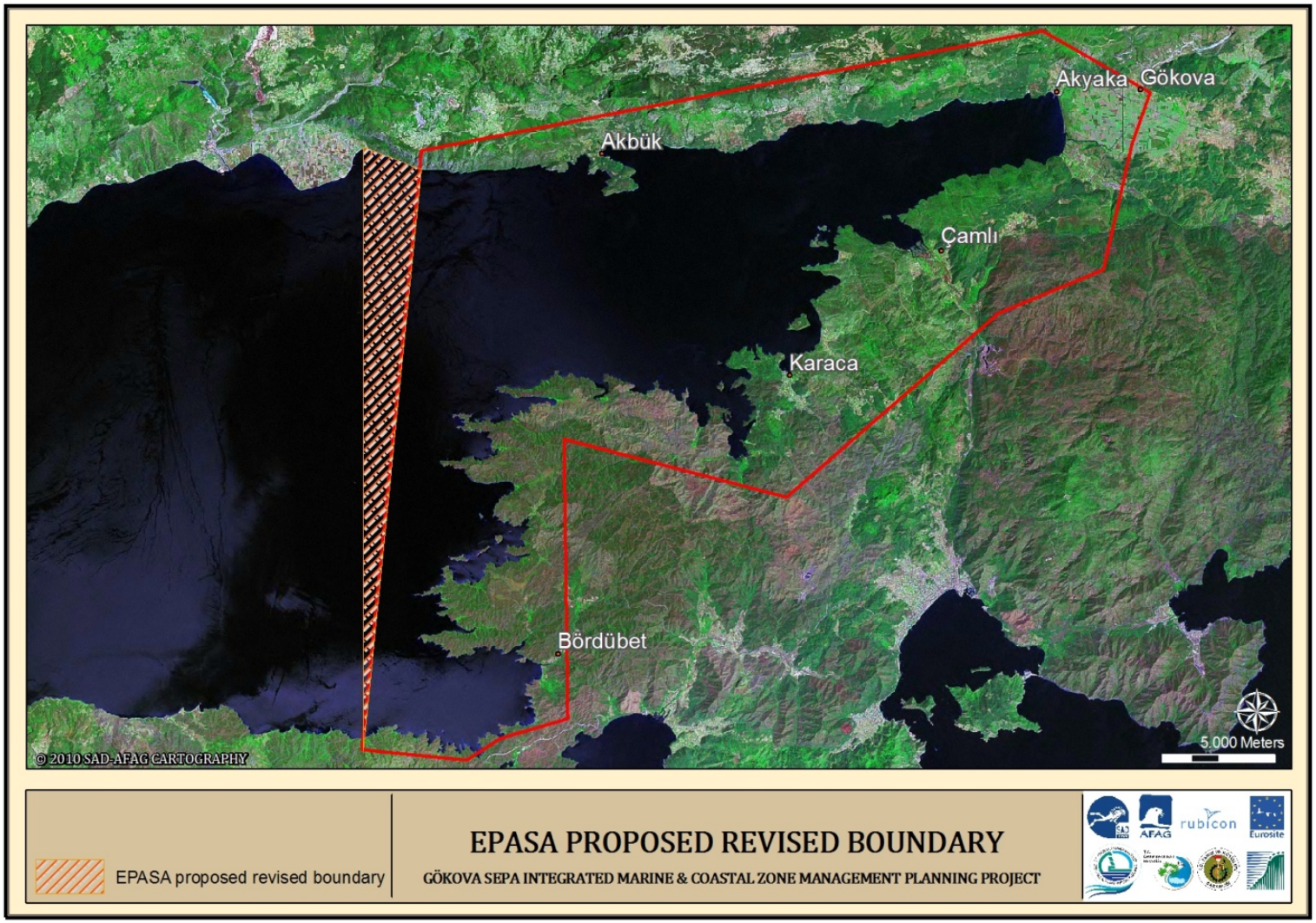

Figure 39 Proposed SEPA boundary

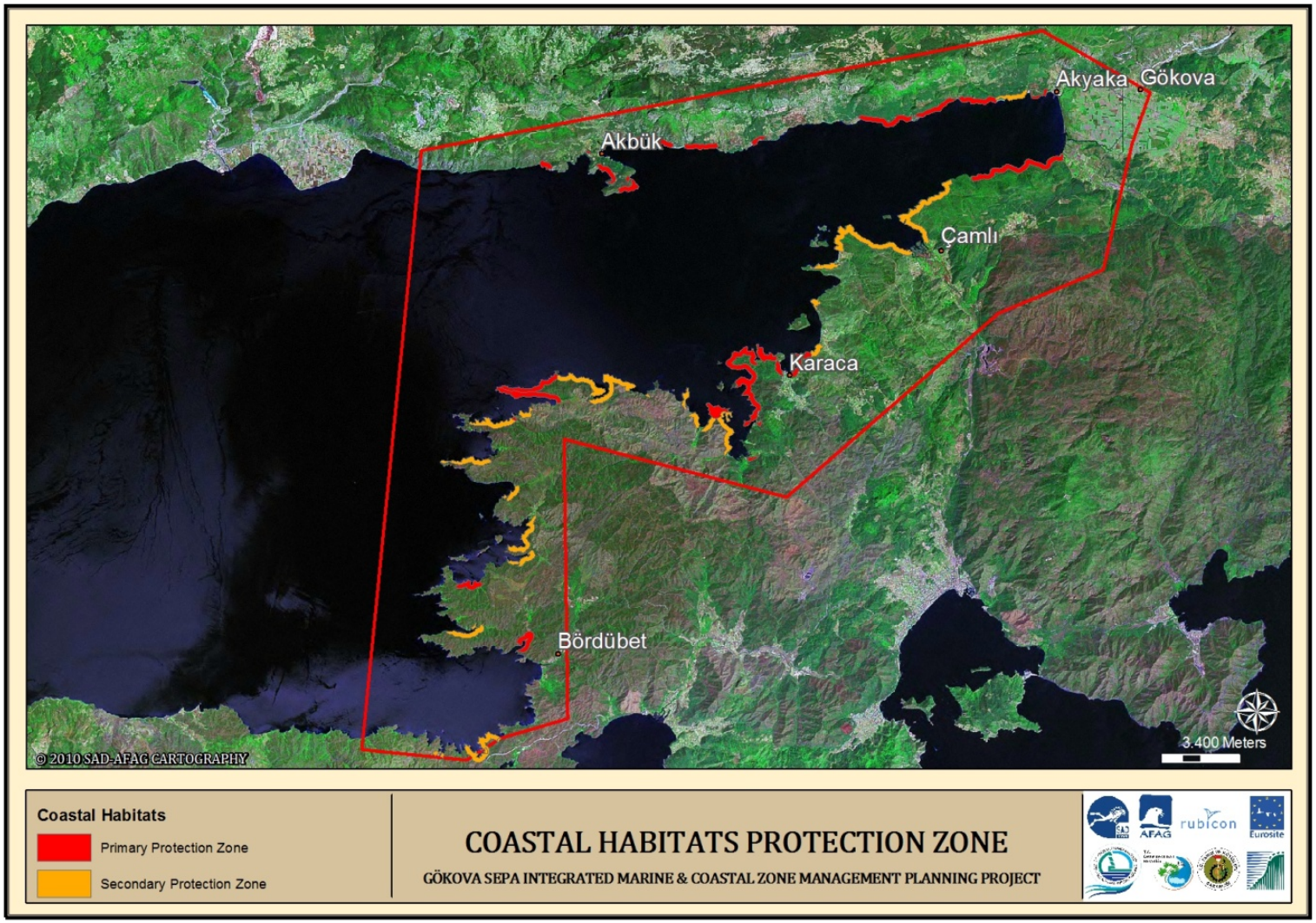

Figure 40 Coastal habitats protection zone

7.4 Action Plan

Table 11 Action Plan

	TARGET	ACTIVITY	ACTION BY	DEADLINE
1	GENERAL	Complete and approve Gökova SEPA Integrated Coast and Marine Management Plan	EPASA	December 2011
2		To include local NGOs into the management plan mechanism	Local NGOs MARA EPASA	Continuous process
3		Activities in local level promoting communication and exchange of information realized	EPASA Municipality NGOs	Continuous process
4		Share information on environmental risks and problems with relevant decision makers and scientists	Local NGOs Fishery cooperatives Tour Boat cooperatives	Continuous process
5		Re-evaluate the results of monitoring activities within nature conservation oriented criteria	EPASA	Continuous process
6		Control of illegal poaching within Gökova SEPA	MoEF Gendarmerie Village Elders	Continuous process
7		Information boards designed and deployed on selected points within Gökova SEPA	EPASA NGOs	March 2012
8		Public awareness and education activities on poaching designed and implemented	EPASA MoEF- DKMPGM GAS-Der. Akyaka City Council Muğla Governorship	Continuous process
9		Create public awareness and communication system and tools (information office, education, publishments, informative boards	MoEF MARA	December 2012

		on restrictions, sensitive habitats, invasive, resilient, endangered species, exotic species)	EPASA Local NGOs	
10		Redefining the responsibility zones of gendarmerie stations so as to attain the optimal intervention	Gendarmerie EPASA	
11		Urban sewage projects with waste water treatment and constructions completed for the settlements within Gökova SEPA	EPASA Muğla Governorship Municipality	June 2015
12		Construction of solid waste collection and treatment facilities	Muğla Governorship EPASA Municipality	June 2013
13		Carry out scientific research studies on the terrestrial fauna and flora of Gökova basin and coastlines	EPASA	December 2013
14		Improve and sustain consistent character, profile in the reconstruction (ekistics) of Akyaka and nearby living grounds	EPASA Municipality Akyaka City Council	Continuous process
15	AGRICULTURE	Education and guiding activities to adopt the practices of ecological friendly agriculture	Provincial and District Directorate of Ministry of Agriculture Local NGOs	December 2012
16		To constitute effective and scientific oriented water management plan	The State Water Supply Administration (DSİ) MARA	December 2011
17		Enforcement of the regulations against planting of exotic flora in the region	EPASA MoEF MARA	December 2015
18		Monitoring wells and illegal water withdrawal	MARA The State Water Supply Administration (DSİ) EPASA	Continuous process

19	FISHERY	Quota regulations to number of fishing boats and fishing equipment in force	MARA- General Directorate of Protection and Control (GDPC)	January 2012
20		Fish stocks of Gökova calculated	EPASA MARA	December 2011
21		Speargun fishing (with scuba or skin diving) to be prohibited in Gökova SEPA	MARA EPASA	June 2011
22		Classification of fishing areas based on fishing activities applied	MARA-GDPC	January 2011
23		Defining and assigning No Fishing Zones approved	MARA-GDPC	Done
24		Strengthen the patrolling system both in terrestrial and marine by responsible organizations	MARA-GDPC Undersecretariat for Maritime Affairs EPASA Coast Guard Headquarters Gendarmerie Headquarters	December 2012
25		Patrol boat of MARA operated for the prevention of illegal fishery	MARA	March 2011
26		Monitor and prevent sea -weed exploitation from Kadınazmağı river as fish bait.	EPASA, Gendarmery and Akyaka Municipality.	December 2010
27		Prohibition of nets made up of nylon thread by regulations	MARA-GDPC	September 2011
28		Collecting ghost nets in Gökova Bay	Muğla University Ege University 9 Eylül University Fishery Cooperatives Local NGOs SAD MARA EPASA	December 2011
29		Cooperation and coordination of local fishery cooperatives improved	Fishery Cooperatives MARA SAD	December 2011

30		Cooperation with relevant specialist institutions and organizations to fill the gaps in the aqua products regulation of MARA completed	MARA-GDPC	April 2012
31	SAILER TOUR BOAT OWNERS	Buoys and mooring anchors to be established in adequate numbers along suitable coasts of Sedir Island.	EPASA	December 2011
32		Quota calculation for number of tour boats to Sedir Island	EPASA	March 2011
33		Re-designed and construction of Akyaka wave breaker	EPASA Municipality	December 2013
34		Shelter for amateur boats planned at Maden Port	EPASA Municipality UMA	December 2012
35		Monitoring of illegal discharge of boats	Undersecretariat for Maritime Affairs-UMA MoEF MARA Tour Cooperatives Fishermen Nature sports schools Local NGOs	Continuous process
36		Enforcement of punishment regarding illegal marine pollution	Municipality Coast Guard Muğla Governership	Continuous process
37		Construction of solid waste collection and treatment facilities	Muğla Governership EPASA Municipality	June 2013
38		Construction of adequate port reception facilities for liquid oily waste by marine vessels	UMA	June 2014
39	TOURISM	Public awareness and education activities on illegal fishery designed and implemented	Akyaka City Council Local NGOs SAD	Continuous process

			Muğla University EPASA	
40		Design, print and distribution of posters, brochures and stickers on illegal fishery and trade	MARA EPASA	April 2012
41		Monitoring and revising management decisions on excursion areas	EPASA General Directorate of MEF Muğla Governorship	Continuous process
42		Local business activities attached to the municipality management classified into sectors	Municipality	March 2012
43		Invest on and increase the capacity of local waste management facilities	EPASA Municipality	March 2012
44		Planning parking areas of commercial boats in Azmak	EPASA	March 2011
45		Kadınazmağı river management plan and exploit principles to be set out by EPASA.	EPASA	January 2011
46		To sustain better quality of social and cultural local life, educational, recreational and social activity areas planned in detailed scales (1/1000 and smaller)	EPASA Municipality Muğla Governership Universities Local NGOs Local operations Kitesurf schools	January 2014
47		Boat yard locations defined and planned	EPASA Muğla Governorship	April 2011
48		Boat yards constructed	Fishery cooperatives Private investors	August 2011
49	Wild boar	Monitoring wild boar population	MoEF EPASA	Continuous process
50	Mediterranean	Carry out high qualified monitoring projects to improve the	EPASA	December 2012

	Monk Seal	knowledge on Mediterranean monk seal behavior and habitat use		
51		Design, print and distribute posters, and relevant publishments for public awareness	EPASA	December 2012
52	Sandbar shark	Carry out high qualified monitoring projects to improve the knowledge on sand bar shark behavior and habitat use	EPASA	April 2011
53		Design, print and distribute posters, and relevant publishments for public awareness	EPASA	Done- December 2011
54	Posidonia sea grass meadow	Exact distribution mapping and percent coverage to be completed	EPASA Muğla	December 2012
55		Define, apply and monitor buoying activity to prevent hazards of anchoring	EPASA	March 2013
56	Fish and macrobenthos	Carry out monitoring projects determining biomass values of existing species and their ecological roles in Gokova Bay	EPASA	December 2012
57	Commercial fish species	Carry out monitoring projects on the diversity and biomass value change in No Take Zones in Gokova Bay.	EPASA	Done- Continuous process
59	Natural coastline habitats	Control and Monitoring of illegal lumbering and shrub cutting	MoEF EPASA Gendarmery	Continuous process
60		Control and monitoring of illegal sand extraction from the beaches and dunes in Gökova SEPA	EPASA Municipality Governorship	Continuous process
61	Wetlands	Control and monitoring of illegal land filling in and around the wetlands	EPASA Municipality Governorship	Continuous process
62		Control and monitoring of wetland torching	EPASA Muğla Governorship MoEF Gendarmery	Continuous process

ACTIVITY 8. DRAFT NATIONAL FISHERY LEGISLATION DEVELOPED

8.1 National legislation and EU acqui in the field of fishery compared

The component consultant M. Kemal Battal completed activities related to legislative proposals for implementation of Council Regulation (EC) No 1967/2006 and fishery in relation to marine protected areas (MPAs) with the related EC Directives as listed below.

- Inspection of provisions of Turkish national legislation related to rules of "Council Regulation (EC) No 1967/2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea"

- Comparison between Turkish related national legislation and "Council Regulation (EC) No 1967/2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea" and determination of gaps.

- Legislative drafting for the purposes of transposing of "Council Regulation (EC) No 1967/2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea" into Turkish national legislation.

- Recommendations for implementation of provisions of aligned Turkish national legislation with "Council Regulation (EC) No 1967/2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea" in Gökova Bay.

He also completed activities related to EU Acquis on organic fish farming with Demian Dessane. The topics are listed below.

- Summarize TR legislation on Organic Aquaculture

- Search for Turkish National Strategy on Sustainable Aquaculture

- Comparison and GAP analysis on Turkish and European Legislations on Organic Aquaculture Comparison and GAP analysis

- Legislative drafting

- Preparation of other recommendations.

The final report of the consultant presented in Annex 48.

ACTIVITY 9. EVAULATION MEETINGS

9.1. Project progress evaluation meeting

A preparatory meeting was held in İzmir on Nvember 2008 with the participation of Assist. Prof. Vahdet Ünal, M. Kemal Battal, Murat Bilecenoğlu, Harun Güçlüsoy, Cem Orkun Kıraç, N. Ozan Veryeri.

The 1st Project Progress Meeting of Gökova ICMM was held on 28th May 2009 in Turkish Chamber of Shipping in Alsancak, İzmir. The participants were; Cem O. Kıraç Project co- leader (TR), Canan Orhun Project co-leader (NL), Assist. Prof. Vahdet Ünal Fishery Management, M. Kemal Battal Fishery Legislation and EU Acqui, Nilay Akça Fish and Macrobenthic Biodiversity, Damien Dessane Organic Aquafarming, Zafer Kızılkaya and Derya Yıldırım Underwater imaging and "No-fishing Project" (as a supporting & co-funding project for Gökova ICMM), Dr. Harun Güçlüsoy, N. Ozan Veryeri Project Manager, Semiha Demirbaş GIS Expert and Elif Tertemiz Project Assistant. Each project staff and consultant explained their studies and mentioned about what have been achieved until date of the meeting (ANNEX 49).

On 25th August 2009, there had been a progress evaulation meeting in the Ministry of Environment and Forestry. The headship of the meeting was Ahmet Özyanık- President of EPASA. The participants were from EPASA and other associated organizations and NGOs. The meeting was the first offical presentation of the project.

The 2nd Project Progress Meeting of Gökova ICMM was held on 12 November 2009 *in* Ankara. The participants were; Cem O. Kıraç Project co- leader (TR), Avifauna Survey, Assist. Prof. Vahdet Ünal Fishery Management, Yalçın Savaş, Posidonia Survey M. Kemal Battal Fishery Legislation and EU Acqui, Zafer Kızılkaya No-fishing Project (as a supporting & co-funding project for Gökova ICMM), Dr. Harun Güçlüsoy, and Gökhan Kaboğlu GIS supervisor. Each

expert explained their studies and mentioned about what have been achieved until date of the meeting.

On 31st December 2009 Cem O. Kıraç Project Co-Leader (TR), Eren Özden Project Assistant and Semiha Demirbaş Çağlayan GIS expert had participated a meeting in EPASA who invited the project team. Mr. Güner Ergün Branch manager has presided the meeting and Dr. Harun Güçlüsoy Project Director of Enhancement of MPA in Türkiye project. The project team informed the progress of the project during first year to the EPASA experts and officers. With this meeting, project team had the opportunity to provide up to date information and interim results of the project to EPASA managers and staff as well as to the Director of MPA Project of EPASA co-funded by Turkish government and GEF. The participants discussed the ways for better implementation of the project and further cooperation fields to fill the gaps such as cooperation in the exchange of pollution data EPASA already obtained.

Cem Orkun Kıraç, Ozan Veryeri, Eren Özden and Semiha Demirbaş from SAD- AFAG; Güner Ergün, Ayhan Toprak, Suda Ekici, Hatice Üncü, Muhsine Mısıroğlu, Leyle Akdağ, Nilay Dalyan, Nilüfer Bayrak and Damla Baykal had a 3-day evaluation meeting between 2nd and 4th March 2010 in EPASA, Ankara. The agenda of the meeting was composed of the evaluation of the problem analyses meeting and the general outcomes of the project components. The problem analyses meeting results were assessed with DPSIR (Driving force-Pressure-State of Environment-Impact-Response) framework. Every job sector group's problems were evaluated in concordance with the framework directives (ANNEX 50).

Cem Orkun Kıraç, Ozan Veryeri, Eren Özden and Semiha Demirbaş had an internal evaluation meeting on 5th March 2010 in SAD HQ in Ankara. The project future calendar, the management plan model, the remaining studies were discussed in this meeting (ANNEX 51).

On 27th July 2010 Cem O. Kıraç, Ozan Veryeri, Serpil Kozludere, Semiha Demirbaş Çağlayan, Eren Özden and Ece Saraoğlu had a meeting with EPASA officers in SAD office. The agenda of the meeting was determining format of shared data especially findings of the field studies with EPASA. All digitized layers and gathered information from field studies were presented to EPASA members (See Activity 5) (ANNEX 41).

ACTIVITY 10.CONFERENCES AND SEMINARS PARTICIPATED

10.1. 8th National Congress on Coastal Zone Management (Trabzon, Türkiye)

Ozan Veryeri, the project manager has participated regular annual conference of Turkish National Committee of Coastal Zone Management held between 28th April and 1st May 2010 in Trabzon with a presentation on Gökova ICMM project under Coastal Zone Management session (http://www.sadafag.org/yayinlar/yayin_219_kay_bildiri_2010_gokova_icmm.pdf).

10.2. International Conference on Coastal Zone Management (Marseille, France)

Ozan Veryeri and Umberto Gallo-Orsi participated the Eurosite workshop; Marine and coastal conservation: MPA & Natura 2000 Management planning in 1-3 September 2010 in Marseille, France. A presentation was done under "Implementing conservation objectives with stakeholders: nautical activities, including amateur fisheries, scuba diving, mooring and jet-skiing" session.

(http://www.sadafag.org/gokova/belgeler/sunumlar/MARINE_COASTAL_CONSERVATION_MPA_NATURA_2000.pdf)

ACTIVITY 0. ADMINISTRATIVE ISSUES

0.2. Comply with administrative requirements

An explanatory letter including proposals about Eurosite Twinning Project which is a simple mechanism for site managers and organisations to work in partnership to improve standards of nature conservation management and practice had been sent to EPASA. EPASA found Area Marina Protetta Cinque Terra (Italy) acceptable by reasons of the mentioned conservation area has much more experience in financial planning and developing administrative systems, applying them with functional work schedules beside the capacity improvement in bring-in.

A draft Memorandum of Understanding (MoU) has been drafted jointly by SAD-AFAG and Rubicon, which was submitted to twinning partners, EPASA and Cinque Terra administrations, for contributions. After getting the proposals from the relevant twinning partners the final MoU

has been prepared and send to EPASA for signature. Although the twinning study visit to Cinque Terra Marine National Park was mutually agreed upon by the twinning partners set as 10 and 15 October 2010, an unexpected cancellation of the schedule was notified by Cinque Terra Marine National Park administration. This was informed to EPASA and the twinning partners meeting in terms of study visit was postponed to a further date.

A meeting was held on 26th March 2010 in EPASA directorate in Ankara within the "No Fishing Zones in Gökova Bay" project which acts as a matching fund project. The representatives of Ministry of Agriculture and Rural Affairs-General Directorate of Protection and Control, Ministry of Environment and Forestry- Environmental Protection Agency for Special Areas Directorate, Undersecretariat for Maritime Affairs, Coast Guard Command, Gendarmery Command, Fishery cooperatives of Gökova and nearby and SAD members were the participants of the meeting. The agenda of the meeting was proposed no fishing zone areas in Gökova Bay, implementation, control mechanism, the problems of conservation attempts and enhancement the situation (See Annex 50).

After the meeting the 3 fishery cooperatives (Akyaka, Sarnıç- Akbük and Akçapınar) sent board decisions associated with the approval of proposed no fishing zones in April.

An explanatory letter was sent to Ministry of Agriculture and Rural Affairs-General Directorate of Protection and Control, Ministry of Environment and Forestry- Environmental Protection Agency for Special Areas Directorate and Coast Guard Command on 25th May 2010, with the letters received from fishery cooperatives and a detailed map showing the locations and coordinates of no fishing zones.

The decision on the announcement of six No-Fishing Zones (NFZs) in Gökova Bay, was entered into force and published in the Official Gazette dated July 10, 2010 after SAD's official application to MARA in May 2010. According to the decision, no fishing activity will be performed in the area covering 23 km^2 in total, approximately 7% of 307 km^2 which is the total marine area of Gökova SEPA (Figure 41). It is important to emphasize hereby that this decision has been made with the cooperation and consensus of the three fishery cooperatives in the region named Akyaka, Akçapınar and Akbük. Ministry of Agriculture and Rural Affairs as the

organization responsible for fishery, Environmental Protection Agency for Special Areas, Undersecretariat for Maritime Affairs and Turkish Coast Guard Command have supported the efforts with full agreement.

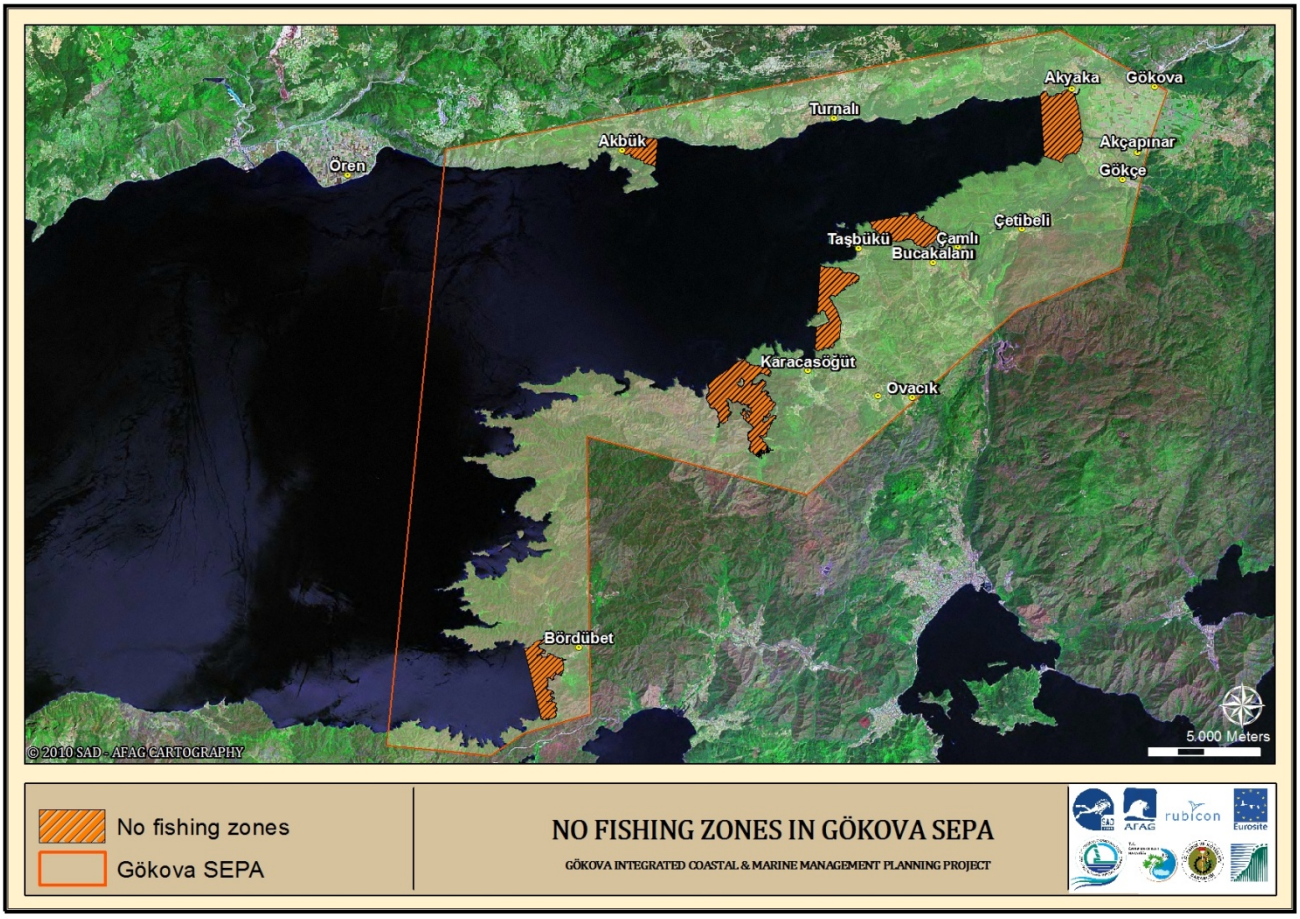

Figure 41 No fishing zones in Gökova SEPA

A technical committee was generated under "Strengthening Protected Area Network of Turkey: Catalyzing Sustainability of Marine and Coastal Protected Areas" Project before the project commencement, which is implemented by EPASA and partially funded by UNDP Turkey. Within this project, apart from Gökova SEPA, 4 other Special Environment Protection Area and a National Park were selected as the project sites (http://www.undp.org.tr/Gozlem2.aspx?WebSayfaNo=2193). Cem O. Kıraç and N. Ozan Veryeri took place in this committee and supported Gökova SEPA to be included in the project. After the project commencement on November 2009, SAD was invited to the project steering committee meetings and Cem Orkun Kıraç participated the 1st Steering Committee Meeting of the project on 22th February 2010.

The project director N. Ozan Veryeri has participated the identification of marine sensitive areas workshop on 20th and 21st May 2010 that was arranged under UNDP supported "Strengthening Protected Area Network of Turkey: Catalyzing Sustainability of Marine and Coastal Protected Areas" Project. There was a local work group meeting in Gökova under the same project, N. Ozan Veryeri also participated that meeting on 25th May 2010 (ANNEX 53).

PROBLEMS DURING EXECUTION OF THE PROJECT

Technical problems

1. Bathymetry related data discrepancy and re-surveying the bathymetry.

2. Microlite has collided to the ground during takeoff when aerial photography mission has been carried out by Zafer Kızılkaya.

Administrative Problems

1. Twinning visit could not be paid due to unexpected development from Italian side.

ACHIEVEMENTS AGAINST INDICATORS

Target	**Biodiversity values identified and assessed**
Verifiable indicators:	Biological diversity reports produced and available
Means of verification:	Project final reports (ANNEX 4, 8, 13)and maps
Target	Socio-Economic values (actual and potential) assessed
Verifiable indicators:	Socio economic structure and professional job groups studied and reports are available
Means of verification:	Project final reports (ANNEX21,22) and maps
Target	Threats and pressures identified and assessed
Verifiable indicators:	Threats and pressures studied and reports are available
Means of verification:	Project final reports (ANNEX 29) and maps
Target	Database for GIS designed
Verifiable indicators:	GIS database developed and available
Means of verification:	GIS available on CD format, the index table is presented in ANNEX 40 Maps

Target	GIS product is distributed to all relevant users and shared with the public via web page.
Verifiable indicators:	GIS product available for use to all relevant stakeholders
Means of verification:	GIS product is distributed to all relevant users and shared with the public via web page by maps
Target	Media campaign developed
Verifiable indicators:	Articles and news are printed and available
Means of verification:	News reports available at SAD-AFAG web site (ANNEX 36)
Target	Web page designed and developed in the SAD-AFAG website
Verifiable indicators:	Web Page is designed and available
Means of verification:	SAD-AFAG website (ANNEX 39)
Target	Training of the Trainers (ToT) workshop on best practices in applying ICMM methodologies held.
Verifiable indicators:	Workshop facilitated by experts from Rubicon and Eurosite held
Means of verification:	Annex 42 and attendance lists available at SAD- AFAG office
Target	Public meeting(s) on Gokova SPA ICMM planning process held.
Verifiable indicators:	Public meetings held and information collected from participants
Means of verification:	Meeting minutes (ANNEX 43, 44, 45, 46, 47)
Target	Twinning project
Verifiable indicators:	MoU is available. *Due to unexpected institutional temporary inconvenience of Cinque Terra side the activity is postponed.*
Means of verification:	See *Administrative Problems* Official communiqué
Target	Integrated Coastal Zone Management Plan drafted in collaboration with EPASA staff and submitted to EPASA.
Verifiable indicators:	ICMM is submitted to EPASA and MinLNV of the Netherlands
Means of verification:	ICMM plan available at EPASA offices
Target	National legislation and EU acqui in the field of fishery compared.
Verifiable indicators:	Comparison report compiled and available
Means of verification:	Comparison report available at SAD-AFAG office. Annex 48
Target	New national legislation in the field of fishery drafted
Verifiable indicators:	Regulations about No Fishing zones are approved on 10th July 2010
Means of verification:	Official gazette