T.C.
ÇEVRE VE ŞEHİRCİLİK
BAKANLIĞI

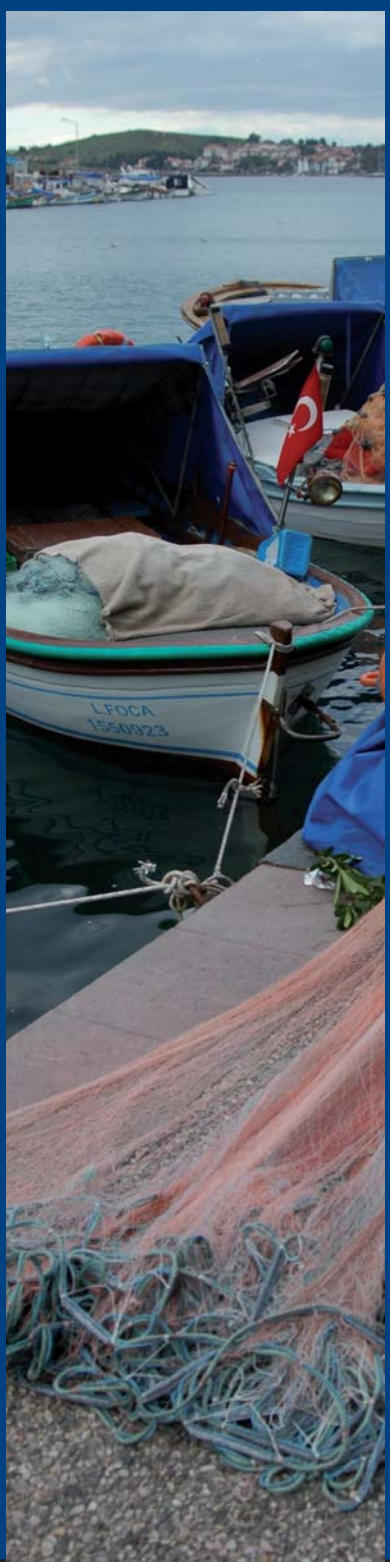
T.C.
Orman ve Su İşleri
Bakanlığı

T.C. DOĞA KORUMA VE MİLLİ PARKLAR GENEL MÜDÜRLÜĞÜ

T.C. GIDA TARIM VE HAYVANCILIK BAKANLIĞI

gef

UNDP
Empowered lives.
Resilient nations.



Economic Analysis of Foça Special Environmental Protection Area

Economic Analysis of Foça Special Environmental Protection Area

Strengthening the System of
Marine and Coastal Protected Areas of Turkey Project

2011

Prepared by
Camille Bann & Esra Başak

General Directorate of Natural Assets Protection (GDNAP)
Alparslan Türkeş Cad. 31. Sok. No.10 06510 Beştepe/Yenimahalle/Ankara
Tel: +90 312 222 12 34 Fax: +90 312 222 26 61
http://www.csb.gov.tr/gm/tabiat

United Nations Development Programme (UNDP)
Birlik Mahallesi 415. Cadde No. 11 06610 Çankaya/Ankara
Tel: +90 312 454 1100 Fax: +90 312 496 1463 www.undp.org.tr
Empowered Lives. Resilient Nations.

For bibliographic purposes this text may be referred as: Bann, C., Başak, E. (2011). *The economic analysis of Foça Special Environmental Protection Area.* Economic Assessment reports for Foça and Gökova in the framework of environmental economics principles. Project PIMS 3697: The Strengthening the System of Marine and Coastal Protected Areas of Turkey. Technical Report Series 2: 76 pp.

This publication is prepared within the framework of large scale "Strengthening the system of Marine and Coastal Protected Areas of Turkey Project" which is funded by the Global Environment Fund (GEF) and executed by the General Directorate of Natural Assets Protection of the Turkish Ministry of Environment and Urbanization and the United Nations Development Programme (UNDP), in partnership with the General Directorate of Fisheries & Aquaculture of the Turkish Ministry of Food, Agriculture and Livestock and the General Directorate for Nature Conservation and National Parks (GDNCNP) of the Turkish Ministry of Forestry and Water Affairs.

Technical Report Series: 2

Authors: Camille Bann & Esra Başak
Cover and Layout Design: Evren Çağlayan
Layout Design Corrections: Gülden Atkın Gençoğlu, Güner Ergün & Harun Güçlüsoy
Cover Photos: Posidonia and diver, Barış Akçalı
Fishnet in Küçükdeniz, Cem O. Kıraç/SAD-AFAG
Siren rocks, Cem O. Kıraç/SAD-AFAG
Photos: 1. Esra Başak, 2. Cem O. Kıraç/SAD-AFAG, 3. Barış Akçalı, 4. Cem O. Kıraç/SAD-AFAG, 5. Cem O. Kıraç/SAD-AFAG, 6. Esra Başak , 7. Harun Güçlüsoy , 8. GDNAP Archives, 9. GDNAP Archives, 10. Barış Akçalı,

This document should not be considered as an official Turkish Ministry of Environment and Urbanization, GEF and United Nations document.

Foreword

Turkey is a country surrounded by the sea on three sides. Turkey's nature and climatic conditions adorn it with a significant biodiversity in its coastal areas. However, there are also problems that touch these regions and that become more imminent everyday. Urbanization, industrialization, tourism, other residential areas and activities alike that leads to irregular and unplanned development that have severe impacts on coastal and marine areas.

Developments, especially in the economy also increase marine transportation and dependency on the use of marine and coastal areas for development, housing, commerce, recreational activities and basic needs. Furthermore, the pressure of fast urbanization and settlement activities on coastal areas leads to many problems including loss of dunes, salt beds and marshes; marine and coastal pollution, deterioration and loss of coastal ecosystems. Biodiversity and fertility of coastal and marine areas are faced with this increasing pressure, leading to damages that cannot be undone.

These coastal and marine areas are one of the most precious assets we have and we must protect them. In order to alleviate these pressures and overcome these challenges, relevant structures and infrastructures for effective implementation and surveillance to ensure that these areas are sustainably managed, preserved and protected without being deteriorated and with a balanced approach between use and protection. In this regard, all related agencies and institutions have to go under a capacity building process to meet the demands of the required structures and infrastructures; cooperation and coordination between all parties have to be improved and an effective and efficiently operating work program and a model for financial resources have to be developed.

In its responsibility area covering a coastline that extends over some 8,592 km, General Directorate for the Natural Assets Protection carries out research activities for the protection and study of threatened and endangered species and habitats that are duly specified in the national legislation as well as in international conventions that Turkey is a party; carries out research activities on the biodiversity of marine and coastal environments; determines the marine surface vessel capacity of important bays and harbors; establishes procedures and principles for use of protection and use of such areas; carries out other integral coastal management activities and strives to minimize risks that threaten such assets.

Protection of marine and coastal resources being a global priority, Marine Protected Areas are fast developing and expanding as a concept. Turkey is no exception to this rule where considerable awareness raising efforts are being carried out.

Through the large scale GEF Project entitled 'Strengthening Turkey's Marine and Coastal Protected Areas' covering the term between 2009-2013 and with the UNDP as the implementing partner, the General Directorate has taken a very first step for devising a long term solution for the protection of marine biodiversity in Turkish coastal waters; for the restructuring of marine and coastal protected areas database and to guarantee effectiveness and sustainability of ecological service functions.

A series of technical reports that are prepared as a part of the project on economic analysis, socio-economy of fisheries in coastal areas, together with other efforts on the identification of marine sensitive areas, integration of economic principles to planning processes, ensuring financial sustainability, mitigation of pollutants from marine vessels and determination of alternative livelihood resources are expected to yield the following project outcomes:

- Responsible institutions have the capacities and internal structure needed for prioritizing the establishment of new MCPAs and for more effectively managing existing MCPAs.
- MCPA financial planning and management systems are facilitating effective business planning, adequate levels of revenue generation and cost-effective management.
- Inter-agency coordination mechanisms in place to regulate and manage economic activities within multiple use areas of the MCPAs.

Documents covering the three main outcomes of the Project so far mentioned are submitted to your perusal.

Osman İYİMAYA
Dep. Gen. Dir.

Acknowledgements

The authors wish to thank the following people for their contributions to this report: Emrah Batkı and Melis Parmaksız (GDNAP Foça Office), Şebnem Kuşçu and Özge Özgen who conducted the tourism surveys; Deniz Kutluözen (GDNAP Foça Office); Dr. Vahdet Ünal and Denizcan Durgun who shared data on fisheries economics; Yalçın Savaş and Gökhan Kaboğlu for sharing GIS related information about the site; all the interviewed parties locally who provided data utilized in the report as well as the GDNAP and UNDP project team.

Acronyms

ESA	Ecosystem Service Approach
EU	The European Union
GEF	Global Environment Facility
GDNAP	General Directorate of Natural Assets Protection
MARA	Ministry of Agriculture and Rural Affairs
MCPA	Marine and Coastal Protected Area
REDD	Reduced Emissions from Deforestation and Degradation
SEPA	Special Environmental Protected Area
UNFCCC	United Nations Framework Convention on Climate Change
UNDP	United Nations Development Programme

Table of Contents

List of Tables

List of Figures

List of Boxes

Exchange rate

1 TL = US$ 0.6235

1 TL= € 0.4

1€ = US$1.40

Yönetici Özeti

Çalışmanın Amacı ve Yaklaşım

Foça Özel Çevre Koruma (ÖÇK) Bölgesi, Akdeniz foklarının da dahil olduğu zengin denizel biyolojik çeşitliliği, kültürel ve arkeolojik varlıkları nedeniyle 1990 yılında deniz ve kıyı koruma alanı ilan edilmiştir.

Bu çalışmanın amacı Foça ÖÇK Bölgesi'nin ekonomik analizini gerçekleştirerek:

- Alanın temin ettiği denizel hizmet ve ürünler yelpazesi hakkında farkındalık yaratmak;
- Kilit ekosistem hizmetlerinin devamını tehdit eden baskılara ve bunların ekonomik sonuçlarına işaret ederek alanın sürdürebilir yönetimine katkıda bulunmak;
- Denizel hizmetlerin ekonomik değerini ortaya koyarak ve potansiyel gelir getirici faaliyet ve mekanizmaların altını çizerek alan için hazırlanacak olan İş Planına bilgi tabanı sağlamaktır.

Bu çalışmanın da bir parçasını oluşturduğu GEF-UNDP projesi kapsamında, Foça ÖÇK Bölgesi için alternatif gelir kaynakları seçenekleri ve masraf azaltıcı mekanizmaların tespit edilmesi ve bir iş planının geliştirilmesi öngörülmüştür. Dolayısıyla bu rapor alandaki ekosistem hizmetlerinin ve değerlerinin tespit edilmesine odaklanmış, potansiyel finansal mekanizmalar hakkında sadece üst düzeyde bir tartışma dahil edilmiştir.

Foça ÖÇK Bölgesi'nin ekonomik analizi alan hakkında mevcut veri ve literatür taramasına, Eylül 2010 ve Mart 2011'de kilit paydaşlarla yapılan görüşmelerden elde edilen verilere ve Haziran 2011'de alanda yürütülen turizm anketlerine dayanmaktadır. Turizm anketleri, Foça ÖÇK Bölgesi'ne gelen turist sayıları, kalış süreleri, harcamaların nitelik ve yapısı, otel doluluk oranları gibi resmi veya basılı istatistiklerde bulunmayan bilgilerin derlenmesini sağlamıştır. Anketler 192 ziyaretçi, 17 turizm operatörü, 22 otel ve 26 lokanta ile gerçekleştirilmiştir. Ayrıca muhtemel yarar transfer değerlerini temin edebilmek, alan için belirlenen değerleri karşılaştırmak ve değerleme yaklaşımlarına dair farklı anlayışları görebilmek için, başta Akdeniz havzası olmak üzere, deniz ve kıyı alanlarında yürütülmüş ekonomik değerleme çalışmalarına dair bir literatür taraması da yürütülmüştür.

Bu çalışma için, Ekosistem Hizmetleri Yaklaşımı (Ecosystem Service Approach – ESA) ve Milenyum Ekosistem Değerlendirmesi'nin tedarik, düzenleme, kültürel ve destek hizmetleri sınıflandırmasına (2005) dayanarak, deniz ve kıyı ekosistemleri hizmetlerine yönelik bir tiploji geliştirilmiştir. Ekosistem Hizmetleri Yaklaşımı denizel ortamlardaki ekosistemlerin ve bunların barındırdığı biyolojik çeşitliliğin bireysel ve sosyal refaha katkıda bulunduğunu açıkça onaylamaktadır. Yaklaşım, bu katkının balık gibi doğrudan tüketilen ürünlerin temininin çok daha ötesine gittiğini, denizel ekosistemlerin karbon tutma gibi kritik düzenleme fonksiyonları olduğunu takdir etmektedir. Dolayısıyla, Ekosistem Hizmetleri Yaklaşımı karar alma süreçlerinde ekosistemlerin bir bütün olarak ele alınmasını ve sağladıkları hizmetlere değer biçilmesini sağlayan bir çerçeve sunmaktadır.

Temel Bulgular

Çalışmada Foça ÖÇK Bölgesi'nin bir yıllık ekonomik değeri 37 milyon ABD doları olarak hesaplanmıştır. Bu, alanın başlangıç aşamasındaki değerini yansıtmaktadır ve daha detaylı çalışmalarla geliştirilmelidir. Ortaya çıkarılan değer tedarik hizmetleri (balık), düzenleme hizmetleri (karbon tutma, erozyon kontrolü ve su arıtımı), ve kültürel hizmetleri (turizm ve rekreasyon) kapsamaktadır. Ancak, turizm için kullanılan muhafazakar tahminler ve kaile alınamayan diğer ekosistem hizmetlerinden ötürü tespit edilen bu değerin alanın gerçek ekonomik değerinin altında olduğu tahmin edilmektedir. Alanda potansiyel olarak varolduğu düşünülen fakat bilimsel bilgi ve/veya veri noksanlığından incelenemeyen ekosistem hizmetleri arasında doğal ilaçlar gibi hammaddeler, genetik kaynaklar ve dekoratif ürünler; denizel ortamın mikro-iklim düzenlemesinde ve sel, fırtınadan korumadaki rolü; alanın eğitim, peyzaj ve miras değerleri gibi henüz üzerinde çalışılmamış hizmetler bulunmaktadır. Aşağıdaki tablo Foça ÖÇK Bölgesi değerleme çalışmasını özetlemektedir.

Tablo. Foça ÖÇK Bölgesi değerleme sonuçları özeti

Hizmet	Değer/ yıl ABD$	Değerleme yöntemi	Not
Balık	6,207,254	Piyasa değerleri	Profesyonel balık avı miktarlarının kayıt dışı olmasından ve rekreasyonel balıkçılığın dahil edilmemiş olmasından ötürü muhtemelen gerçek değere göre düşük bir değerdir. Ancak, bu tahmin sürdürebilir av miktarını daha iyi yansıtabilir (şu an alan için bilinmemektedir). Brüt değerlerdir – masraflar düşülmemiştir.
Karbon tutma	408,218	Piyasa değerleri (kaçınılan harcama yaklaşımı)	Orman karbon piyasasına benzer şekilde Mavi Karbon Kredi piyasasının gelişeceği varsayılmıştır. Dolayısıyla bu değer henüz "yakalanmamaktadır'. Karbon piyasa değeri 11,2 $/ tCO_2eşdeğeri olarak alınmıştır.
Erozyon kontrolü	5,263,731	Yarar transferi	Mangos *ve diğ.* (2010). Her kıyı metresi için 160.000 avro, Foça ÖÇK Bölgesi'ndeki 45,2 km'lik Posidonia çayırlarına ve alanın %52'sinin risk altında olduğuna dayanarak.
Atıksu arıtımı	882,000	Yarar transferi	Mangos *ve diğ.'ne* (2010) dayanarak, Türkiye kıyıları için hesaplanan 229 milyon €'luk arıtım hizmeti Foça'daki 23km'lik kıyısal alana taksim edilmiştir.
Turizm/ Rekreasyon	24,305,000	Piyasa değerleri	Çalışma kapsamında yürütülen turizm harcamaları anketine ve bölgeye gelen ziyaretçi sayılarına dair muhafazakar kestirimlere (yılda 20.000 geceleyen ve 139.750 günübirlik ziyaretçi) dayanarak.
TOPLAM	37,066,203		

Alanın değerlerinin %65'i turizm ve rekreasyona dayanmaktadır. Bu bulgu, turizm kaynaklı gelir akışının devam edebilmesi için bölgede endüstriyi sürdürebilir bir şekilde yönetmenin önemine işaret etmektedir.

Turizm ve rekreasyonu takiben, balıkçılık yıllık 6,2 milyon ABD dolarlık bir ortalama ile ikinci en önemli ekonomik değeri oluşturmaktadır. Bu değerin, profesyonel balık avı miktarlarının ve gelirlerin büyük ölçüde kayıt dışı gerçekleştirilmesinden ve rekreasyonel balıkçılığın hesaba dahil edilmemiş olmasından ötürü gerçek değerine göre daha düşük olduğu tahmin edilmektedir. Ancak bu değer Foça'daki balıkçılığın sürdürebilir av oranını yansıtmaz. Alan hakkındaki mevcut literatür ve çalışmalar, ve değerleme çalışması sırasında bölgede yürütülen görüşmeler balık stoklarının yönetimi ve sürdürebilirliği konusunda yasa dışı avcılığın yoğunluğundan kaynaklı kaygıları ortaya koymuştur.

Öneriler

Çalışma sonucunda, değerleme yöntemlerinin iyileştirilmesine ve denizel ekosistem hizmetlerinin daha etkin ve sürdürebilir yönetilmesine yönelik bazı öneriler geliştirilmiştir. Örneğin;

- Ticari ve rekreasyonel balıkçılık için yapılan değerleme sürdürebilir av oranının (miktar) net faydaya (gelirler eksi masraflar) çarpılmasına dayandırılmalıdır. Foça'da balıkçılık sektöründen elde edilen yüksek ekonomik getirilerin devam edebilmesi için balık stoklarında kapsamlı ve düzenli sayısal analizler yapılması elzemdir. Ayrıca, Foça ÖÇK Bölgesi'nde balıkçılığın yönetiminde ekosistem tabanlı bir yaklaşım gerekmektedir.
- Foça ÖÇK Bölgesi sınırlarındaki kıyının %60'ı yerleşim alanından oluşmaktadır. Dolayısıyla, bölgede ileride yapılması öngörülen turizm veya iskan amaçlı herhangi bir gelişimin hem denizel hem de karasal çevrede biyolojik çeşitlilik üzerinde yaratacağı etkileri hesaplanmalı ve düzenlenmelidir (ör, kirlilik girişi). Foça'nın tarihi yapısını koruması ve yoğun bir turizmleşmeden sakınması şarttır. Turizm sektörünün sürdürebilirliği denizel alanda yürütülen etkin bir şekilde yönetilen faaliyetlere dayanmalıdır. Şu anda sınırlı bir sezona kısıtlı olan turizm rüzgara dayalı rekreasyonel faaliyetler aracılığıyla uzatılabilir.
- Alandaki düzenleme hizmetlerinin özünü oluşturan ekolojik süreçler daha iyi kavranmalıdır (ör, Foça'daki Posidonia çayırlarının kıyısal erozyonu önlemedeki rolü). Bunun gibi alana spesifik bilimsel (fiziksel) veriler ekonomik analizin dayandırılacağı temelleri sağlamlaştıracaktır.

Executive Summary

Objectives of study & approach

Foça Special Environmental Protection Area (SEPA) was designated as a Marine and Coastal Protected Area (MCPA) in 1990 on account of its rich marine biodiversity (including its Mediterranean monk seals), cultural and archeological heritage.

The objective of this study was to undertake an economic analysis of Foça SEPA in order to:

- Raise awareness of the range of marine goods and services provided by the site;
- Contribute to the sustainable management of the site by highlighting pressures threatening the viability of key ecosystem services and the economic implications of this;
- Inform the business plan to be developed for the site by demonstrating the economic value of marine services and highlighting potential revenue generating activities and mechanisms.

It should be noted that other components of the GEF-UNDP project under which this study sits are focused on the identification of feasible income generating options, the determination of cost-offsetting mechanisms and the development of a business plan for Foça SEPA. Therefore this report is focused on the identification and valuation of ecosystem services and only provides a high level discussion of potential financing mechanisms.

The economic assessment of Foça SEPA is based on a review of the available data and literature on the site, interviews with key stakeholders and data gathered through site visits in September 2010 and March 2011 and a tourism survey undertaken in June 2011. The tourism survey was able to provide information on the tourist numbers, duration of their stay, composition and expenditure patterns, and hotel occupancy rates within Foça SEPA, which was not available from official or published statistics. The survey covered 192 visitors, 17 tour operators, 22 hotels and 26 restaurants. A literature review of economic valuation studies of marine and coastal areas especially from the Mediterranean region was also undertaken to provide potential transfer values, benchmarks against which to assess values derived for the site and insights on valuation approaches.

A typology of marine and coastal ecosystem services has been developed for this study following the ecosystem service approach (ESA), which is based on the Millennium Ecosystem Assessment (2005) classification of ecosystem services into provisioning, regulating, cultural and supporting services. The ESA explicitly recognizes that ecosystems such as marine environments and the biological diversity contained within them contribute to individual and social wellbeing. Importantly it recognizes that this contribution extends beyond the provision of goods such as fish to the natural regulating functions of marine ecosystems such as carbon sequestration. The ESA therefore provides a framework for considering whole ecosystems in decision making and for valuing the services they provide.

Key Findings

This study estimates the economic value of Foça SEPA at around US$37 million per year. This provides an initial value of the site, which needs to be refined through further study. This value incorporates provisioning services (fish), regulating services (carbon sequestration, erosion protection and waste treatment), and cultural services (tourism and recreation). It is considered to be an underestimate of the economic value of the site in that conservative estimates have been used for example for tourism and a number of potentially important services are not included. Ecosystems services thought to be present (or potentially present) at the site which cannot be estimated due to a lack of scientific information and/or data are – raw materials such as natural medicines, genetic resources and ornamental resources, which have yet to be studied at the site; the role the marine environment plays in micro-climate regulation, the role of the marine environment in flood and storm protection, the site's heritage value and educational value and the site's landscape and amenity value. The Table below provides a summary of the valuation results for Foça SEPA.

Table. Summary of valuation results for Foça SEPA

Service	Value/ year US$	Valuation approach	Comment
Fish	6,207,254	Market prices	Probably an underestimate due to under reporting of fish catch and recreational fishing is not included. However this estimate may better reflect a sustainable catch level, which is unknown for the site.
Carbon sequestration	408,218	Market prices (avoided cost approach)	Assumes development of market in blue carbon credits analogous to the forest carbon market. This value is therefore not currently 'captured'. Based on a market price of carbon of US$11.2 / tCO_2eq.
Erosion protection	5,263,731	Benefits Transfer	Mangos *et al* (2010). Based on 160,000 Euro per meter of coastline, 45.2 km of *Posidonia* beds in Foça SEPA and 52% of the area at risk.
Waste treatment	882,000	Benefits transfer	Based on Mangos *et al* (2010) estimate for Turkey of 229 million Euros and apportioned to the study site based on length of its coastline (23km).
Tourism / Recreation	24,305,000	Market prices	Based on a conservative estimate of tourist numbers (20,000 overnight visitors and 139,750 day visitors per year) and a survey of tourist expenditure undertaken by this study.
TOTAL	37,066,203		

Over 65% of the site's value is attributable to tourism and recreation in the area highlighting the importance of sustainably managing the tourism industry in order to secure this revenue flow.

Following tourism and recreation, fish, estimated at US$ 6.2 million per annum, is the second most significant economic asset. This is likely to be an underestimate of current revenue flow because it does not include recreational fishing carried out in Foça and because there is a general tendency for fishermen to under report their actual catch and earnings. However, this estimate does not reflect a sustainability harvest rate for the fisheries in Foça. The available literature and studies on the site and field interviews for this study raise concerns about fisheries management and the future sustainability of the stocks in the region due to the intensity of illegal fishing activities at the site.

The valuation results also highlight the economic importance of the site's regulating services, in particular the site's Posidonia meadows, which provide erosion protection and carbon sequestration benefits (14% and 1% of the total economic value respectively).

Recommendations

The study has identified a range of recommendations aimed at the refinement of the valuation estimates and improved sustainable management of the marine ecosystem services. For example;

- In terms of commercial and recreational fisheries, the valuation should be based on a sustainable harvest rate (quantity) multiplied by net benefits (revenues minus costs). Comprehensive (and regular) quantitative analysis of the fish stocks is therefore urgently needed in Foça to sustain the high economic returns coming from the sector. Furthermore, an ecosystem based approach to fisheries management is necessary in the Foça SEPA.
- Over 60% of the coast in Foça SEPA is built-up, thus further development for tourism purposes should be regulated in terms its biodiversity impacts both in the marine and terrestrial environments (i.e., waste inputs). It is essential that Foça retains its quaint historical characteristics and avoids intensive tourism developments. The tourism sector's sustainability needs to be based on a range of well-managed marine activities. The currently limited tourism season could potentially be

extended through wind-based recreational activities.

- Improved understanding of the ecological processes that underpin the regulatory services at the site are needed (i.e., site specific studies on the role of Posidonia in important functions such as coastal erosion protection) in order to obtain site specific scientific (physical) data on which to base the economic analysis.

INTRODUCTION

2

This study is an activity under the Global Environment Facility - United Nations Development Programme (GEF-UNDP) project 'Strengthening the Protected Area Network of Turkey: Catalyzing Sustainability of Marine and Coastal Protected Areas'.

The proposed long-term solution for marine biodiversity conservation in Turkey's territorial sea is a reconfigured Marine and Coastal Protected Area (MCPA) network designed to protect biodiversity while optimizing its ecological service functions. The success of this long-term solution is seen to rest on three main pillars: (i) the existence of key agencies capable of identifying and managing sensitive and biologically significant MCPAs; (ii) ***the application of economic analysis to inform the planning and management of MCPAs and the integration of sustainable financing mechanisms;*** and (iii) inter-sectoral co-operation that builds on the relevant strengths of various management agencies and branches of Government and civil society to solve marine biodiversity conservation challenges. This study relates to the development of the second pillar.

1.1. Objective

The objective of this study was to undertake an economic analysis of Foça Special Environmental Protected Area (SEPA) in order to:

- Raise awareness of the range of marine goods and services provided by the site
- Contribute to the sustainable management of the site by highlighting pressures threatening the viability of key ecosystem services and the economic implications of this
- Inform the business plan to be developed for the site by demonstrating the economic value of marine services and highlighting potential revenue generating activities and mechanisms.

It should be noted that other components of the GEF-UNDP project under which this study sits are focused on the identification of feasible income generating options, the determination of cost-offsetting mechanisms and the development of a business plan for Foça SEPA. Therefore this report is focused on the identification and evaluation of

ecosystem services and only provides a high level discussion of potential financing mechanisms.

1.2. Approach

The economic assessment of Foça SEPA is based on a review of the available data and literature on the site, interviews with key stakeholders and data gathered through a site visit in March 2011 and a tourism survey undertaken in June 2011. A list of people consulted is provided in Annex 1, while the tourism survey instrument is provided in Annex 2. A literature review of economic valuation studies of marine and coastal areas from the region was also undertaken to provide potential transfer values, benchmarks against which to assess values derived for the site and insights on valuation approaches.

An Ecosystem Service Valuation Framework was developed for the assessment, which provides a comprehensive list of marine and coastal services provided at the site (see Section 3). This framework provides the basis for understanding the range of benefits provided by the marine ecosystem and the pressures that they face.

1.3. Layout of report

The rest of this report is set out as follows: Section 2 provides an overview of the site and the pressures that it faces plus available information on the socio-economic characteristics of the area; Section 3 presents the marine ecosystem services typology and a qualitative assessment of the services provided by the site; Where the required bio-physical and monetary data is available for a given ecosystem service, Section 4 presents the valuation of individual ecosystem services; Section 5 discusses potential financing mechanisms: and, section 6 concludes. Appendix 1 lists the people interviewed during field visits in March 2001 and Appendix 2 presents the tourism survey instrument.

BACKGROUND ON SITE

Foça Special Environmental Protected Area (SEPA) is located in the Aegean Region and encompasses a large part of the Foça district,one of Izmir Province's 30 districts (İzmir Governorship 2010). The area was granted SEPA status in 1990, largely on account of its monk seal population. It covers 71.38 km² and is the smallest marine and coastal SEPA in Turkey (EPASA 2008). Foça is surrounded by Izmir Bay in the West, Menemen county in the East, Çandarlı Bay in the North, and is located 70 km away from Izmir town center (Figure 1). It includes one sub-district and 5 villages within its administrative boundaries. Foça's small archipelago is made up of the following islands from South to North: Incir, Fener, Orak, Pite, Metalik, Hayırsız and Kartdere Islands and the Siren Rocks on the Western shores of Orak Island (GDNAP 2011).

Figure 1. Location of Foça Town (source: Kıraç&Güçlüsoy 2008)

Foça is one of the 12 ancient Ionian cities, named Phocaea, and has significant archeological features

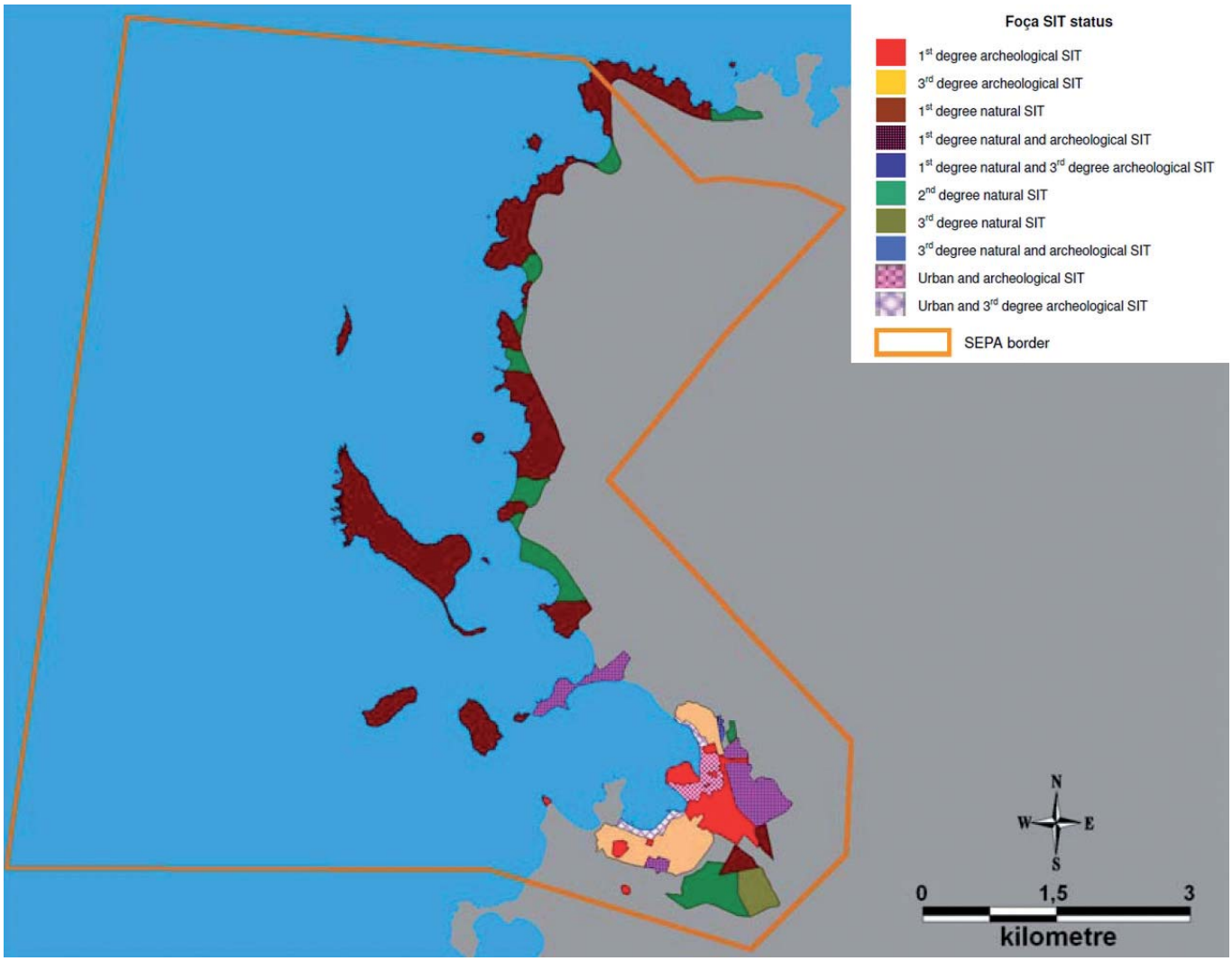


Figure 2. Natural and Archeological SİT zones in Foça SEPA (source: Foça Municipality)

protected under S.I.T. status[1] (Akurgal 1998). The region also encompasses natural and architectural S.I.T. protection of 1st and 2nd degrees (*ibid*).

In addition to the areas of natural and archeological conservation status, Foça also has a military base with three brigades. These overlapping zones of restricted use have shaped the profile of the town in terms of settlement (see Figure 2).

[1] The Ministry of Culture and Tourism, General Directorate of Conservation of Cultural and Natural Assets assigns conservation status of varying degrees in Turkey based on the "The Law of Conservation of Cultural and Natural Properties" (dated 21.07.1983; No: 2863; amended by law no: 3386 and 5226). "First degree natural sites" are sites of exceptional natural characteristics that should be conserved and only used for scientific purposes. "Second degree natural sites" are conserved areas where some tourism-oriented construction can be allowed.

2.1. Biodiversity overview

Mediterranean monk seals (*Monachus monachus*) have lived in Foça for thousands of years and the town reportedly takes its name from the species, "fok" in Turkish (Kıraç & Güçlüsoy 2008). There are only approximately 500-600 Mediterranean Seals in the world and the species is at risk of extinction (ibid). The species is therefore of high global conservation concern and is listed under the Bern Convention (Council of Europe 1979).

The number of Mediterranean Seals on Turkey's coasts is estimated to be less than 100 (ibid), while the number of monk seals in Foça is estimated to be between 6 to 10 (Sualtı Araştırmaları Danışmanlık 2008). The coasts in the region are

known to be one of the most convenient habitats for seals due to their rich fish stocks and the shallowness of the sea (GDNAP 2011) thus the species feeds around the MCPA (Kıraç & Güçlüsoy 2008). The Siren rocks, on the western coast of Orak Island, consist of caves that provide reproduction habitat for the seals. In 1991, Foça was selected as a Pilot Monk Seal Conservation Area (PMSCA) in order to implement the National Strategy for the Conservation of the Monk Seal (Güçlüsoy & Savaş 2003). In 1992, small scale coastal trawlers known regionally as *trata* and *ığrıp* have been banned in the area in order to reduce the disturbance to the monk seals. Between 1991 and 2004, the Underwater Research Society SAD-AFAG conducted consistent conservation and monitoring activities in the region specific to the species.

Ornithological research carried out in Foça identified 118 bird species with 68 of them breeding in the site (Döndüren 2007). Especially the islands that fall within the SEPA as well as the coastlines provide breeding grounds and refuge for the following **bird species of conservation significance**: little kestrel (*Falco naumanni*), shag (*Phalacrocorax aristotelis desmarestii*), peregrine (*Falco peregrinus*), little stern (*Sterna albifrons*) and Audouin's gull (*Larus audouinii*) (Eken *et al* 2006).

Approximately 50% of the terrestrial section in Foça SEPA is covered with red pine forests. The flora is mainly composed of maquis and shrubs. The following species occur in the forests - wild boars, wolves, foxes, jackals, martens, partridges, turtle doves and quails. Just to the South of the SEPA is the Gediz Delta, a globally important wetland with Ramsar status, which is a stopover place for migrating birds and rich in the fish species. In the winter and autumn wild geese are seen in great numbers in the region.[2]

Research on the **fish species** identified 50 species pertaining to 24 families in Foça SEPA, all consisting of local fishes (Sualtı Araştırmaları Danışmanlık 2008). Of these, brown meager (*Sciaena umbra*) and dusky grouper (*Epinephelus marginatus*) are listed as species of conservation concern under the European Council's Bern Convention (*ibid*). Furthermore, 30 different **algae species** pertaining 19 families have been observed in the SEPA (*ibid*).

2.2. Overview of pressures

Table 1 provides an overview of the pressures facing the site. One of the most pressing issues is the prevalence of illegal fishing activities which leads to overexploitation of the marine stocks and consequently affects the whole food chain. The marine biodiversity of the MCPA is thus threatened. Another key pressure is the overuse of the coasts and seas, which leads to the degradation of the ecosystems and related services. Daily excursion boats and other marine vehicles which exceed the carrying capacity of the site are among the main drivers of this pressure, leading both to the destruction of sea bottom and marine pollution. This pressure compounded by insufficient municipal infrastructure such as waste water inputs, leakage of boats' bilge water, waste water and solid waste. Other pressures include invasive species (an algae) and increasing freshwater demands driven by tourism in the high season.

In general the site requires a cohesive management plan[3] whose implementation is effectively enforced in order to tackle these pressures.

[2] GDNAP's website specific to Foça SEPA: http://www.ozelcevre.gov.tr/icerik-18-Foca.html.

[3] Foça SEPA's management plan has been prepared with the participation of the relevant local and central authorities and stakeholders as of May 2011; however, the strategy for its implementation remains unclear.

Table 1. Overview of Pressures

Pressure	Description	Policy Driver / Context	Sector Responsible
Overexploitation and illegal extraction of the fish stocks	Even though Foça is a protected area, it is a heavily exploited fishing ground both for artisanal and industrial means (trawlers and purse-seiners). Illegal fishing activities by trawlers, purse-seiners, and other boats known as "*şebeke*" locally occur within the SEPA (Kıraç and Güçlüsoy 2008) as well as by individuals (using spear-guns). This is depleting local fish stocks and affecting the marine food chain, including the feeding stocks of the threatened Mediterranean monk seals (which can in turn impact their breeding and nursing abilities). The peak tourism season in summer months increases the demand for seafood (Sualtı Araştırmaları Danışmanlık 2008), while the growing demand for recreational fishing is also be putting further pressure on the stocks.	- Lack of enforcement of existing laws - Ineffective monitoring and control of fishing activities (Coast Guard + the Environmental boat of GDNAP & municipality's are not operational) - Present license system of the trawlers falls short on restricting the fishing effort (Ünal 2004). - No notable economic regulations such as taxes, buy-back programmes, restriction on fishing capital (Ünal 2004) - Lack of self-regulation mechanisms within the fishing community - Corruption	Commercial and Amateur Fishing, Tourism,
Increasing human usage of the marine and coastal environment	Increased usage of the sea, coasts and islands in Foça creates pressures on the globally threatened monk seals as well as the populations of breeding birds. During the high tourism season, daily sea excursion boats approach the breeding and resting coves of the monk seals and bird colonies during their sensitive breeding period in the Spring, especially in the Orak Island.. Around 700 marine vehicles are estimated in the SEPA as a whole (Kıraç and Güçlüsoy 2008) representing a three fold increase of the sea usage compared to 15 years ago.	- Conflicting interests of planning and other administrative authorities - Ineffective monitoring and control of the MCPA - Lack of enforcement of existing conservation regulations - Insufficient awareness raising activities locally (i.e., signboards)	Road infrastructure, secondary housing, tourism, fishing
Coastal and marine pollution	Pollution from petrol and solid waste are observed in the MCPA. Solid waste such as trammel nets pose a physical threat to younger monk seals. Heavy metals have also been detected in the monk seals (Kıraç and Güçlüsoy 2008). Marine pollution is further triggered by the bilge water of the boats for which there is no existing collection system. In Foça port alone, 21 m^3 of daily waste water is estimated to be released by boats during the summer months (Sualtı Araştırmaları Danışmanlık 2008).	- Inefficient monitoring and control - No action taken to identify and remove lost fishing gears and also to eliminate the negative effects of ghost netting - Environmental inspection boats that act as a deterrent are not operational (GDNAP's & municipality's) - Ineffective implementation of preventive measures (i.e. Pollution fines) - No bilge water collection systems	Tourism & Fishing (boats)
Damage and destruction of the sea bottom	Boat anchors (especially of the daily tour boats) have a negative impact on the marine biodiversity. The Posidonia beds in Hamamlık Bay are particularly affected (Sualtı Araştırmaları Danışmanlık 2008)	- Lack of buoys and mooring sites within the MCPA - Inefficient monitoring and control	Tourism & Fishing

Table 1. Overview of Pressures

Pressure	Description	Policy Driver / Context	Sector Responsible
Invasive marine species *Caulerpa* racemosa var. cylidracea	*Caulerpa racemosa var. cylidracea, and* invasive marine species, enters the Mediterranean from channels (Suez and Gibraltar). It is among the fastest spreading marine weed in the Aegean and has negative effects on biodiversity and ecosystems (Akçalı and Cirik 2007)	- The distribution of this algae is not monitored - No actions to date have been undertaken to eradication this species	Marine transport, Fishing
Lack of freshwater supplies and water treatment facilities	Foça town center sees a five-fold population increase during the high tourism months (Sualtı Araştırmaları Danışmanlık 2008). This puts pressure on local freshwater resources. While only half of the 8 wells are used during the winter, all wells are used at full capacity during the summer - but this remains insufficient. Furthermore, 75% of the households are connected to canalisation systems in Foça and the rest has septic tanks. Following treatment, the waters are discharged near the Orak Island at 60m depth via a 3 km tunnel. This, along with outputs containing suspended solid matter from Gediz River, impact the marine environment in the SEPA.	- Poor urban planning - Inefficient water treatment systems in local and regional watersheds	Tourism, Agriculture

2.3. Socio-Economic Characteristics of the site

Based on a 2009 census, Foça's population is 25,581, 62% of which are men and 38% are women (TUIK 2009). The wide difference in the gender distribution (especially in the 20-29 ages range) can be explained through the presence of the military units in Foça (Aykom 2008). The town's population doubles during the high tourism season in the summer.

The literacy rate for Foça is nearly 95%, ranking 12th among Turkey's 872 districts (Aykom 2008). Foça has ten primary schools and three high schools; 50% the population has graduated from primary school and 30% from high school.

Among İzmir's 30 districts, Foça ranks 23rd in terms of employment levels, with 2,631 people in employment in 2008 (IZKA 2009). The main income sources in Foça District as a whole are tourism, fishing, agriculture & animal husbandry, forestry and agriculture based small industries (Aykom 2008). In the sub-districts and villages tied to Foça (outside of the SEPA), the economy is largely agrarian. In the town center, however, 64.5% of the workforce is employed in the service sector resulting in Foça being ranked as 18th out of 872 districts in Turkey in terms of employment in the service sector (*ibid*). This is due to Foça's military base and a large number of soldiers and state employees being concentrated in the town center along with small businesses catering for tourism.

About 500 companies operate in Foça, the majority of which are hotels and restaurants, followed by construction firms and wholesale businesses (*ibid*). Foça contributes to about 3% of the province's total export ratio with exclusively light metal industry (*ibid*).

Agriculture is the another important sector in Foça district after tourism and services. Even though no agricultural areas fall strictly within the borders of the SEPA, the Eastern part of Foça settlement is surrounded by olive fields. In the sub-districts and villages of Foça, the economy depends on agriculture and a wide variety of fruits, vegetables and citrus plantations are cultivated (IZKA 2009). Agricultural land use is as

follows: 50% arable lands, 31% olive groves, 10% horticultural lands (Aykom 2008). About 65% of this agricultural landscape is irrigated as Foça is situated in the Northern edge of the Gediz plain (Foça District Agricultural Directorate 2010).

Foça retains much of its traditional character, and its population still depends on fishing and farming as their main sources of income. Furthermore, animal husbandry is practiced in the district and there is a successful milk products cooperative that produces the locally savored Foça yogurt. Foça wine utilizes the grapes of the region. According to the 2002 census, women are more engaged in these rural economic activities than men (about 4,500 women as opposed to 3,100 men) (Aykom 2008).

With the development of secondary homes, Foça has seen an increase in retirement homes, which are populated for part of the year (Gümüş & Özüpekçe 2009). Accordingly, surveys conducted by Aykom (2008) classified retirement pensions as the highest revenue source in Foça SEPA (43.3%), followed by salaried positions (26.7%), fishing (8.5%) among others.

QUALITATIVE ASSESSMENT OF ECOSYSTEM SERVICES

4

3.1. Marine Ecosystem Services Typology

A typology of marine and coastal ecosystem services has been developed for this study following the ecosystem service approach (ESA), which is based on the Millennium Ecosystem Assessment (2005) classification of ecosystem services into the following four categories:

- ***Provisioning services*** relate to the tangible products, such as fish and pharmaceuticals, provided by marine ecosystems.
- ***Regulating services*** refer to the marine environment's natural processes such as waste assimilation and carbon sequestration that contribute to social wellbeing.
- ***Cultural services*** may be associated with both use and non-use values and relate to the non-material benefits obtained from ecosystems, for example, through tourism and educational use of marine environments.
- ***Supporting services*** are necessary for the production of all other ecosystem services (e.g. soil formation or nutrient cycling). They differ from the other services in that their impacts on people are either indirect (via provisioning, regulating or cultural services) or occur over a very long time.

The ESA explicitly recognizes that ecosystems such as marine environments and the biological diversity contained within them contribute to individual and social wellbeing. Importantly it recognizes that this contribution extends beyond the provision of goods such as fish to the natural regulating functions of marine ecosystems such as carbon sequestration. The ESA therefore provides a framework for considering whole ecosystems in decision making and for valuing the services they provide.

It is important to note that economic valuation is focussed on the 'final benefits' or 'outcomes' realised by society from the services marine ecosystems provide, not the services and functions that contribute to those outcomes. This is to avoid double counting. The benefits generated by supporting services, while fundamental to the provision of final benefits, are not valued independently as they are intermediate benefits which contribute to the

provision of a range of final benefits. Their value is captured in the valuation of the final outcomes associated with the services they support. Supporting services include soil formation and retention, primary production and habitat provision[4].

Health is also not explicitly listed as an ecosystem service as health benefits are considered to be provided by a range of services such as fish, flood protection benefits and a clean environment for recreation. The health cost associated with a deterioration in these services may be used to measure the benefits provided by the marine ecosystem. Biodiversity is also considered to be cross cutting, the final benefits of which could be associated with a range of services. An exception is biodiversity non-use which is listed a separate service.

Table 2 provides a typology of marine ecosystem services and a qualitative assessment of the marine ecosystem services provided at Foça SEPA. Each ecosystem services has been rated as follows: '**' means that the service is important, '*' means that the service is provided, '-' means the service is not relevant at the site, and '?' means that there isn't enough information to determine whether the services is present or not, so its provision is uncertain. Table 2 also identifies the sectors that are supported by (or benefits from) the provision of each ecosystem service and the sectors that can influence the quality and quality of that service.

The typology presented in Table 2 does not include marine sub-habitat types, which can include hard beds, rocks, muds, sands, gravels, seagrass meadows and caves. The extent of services provided will depend on the specific sub habitat type. The available data at Foça SEPA did not warrant this level of detail, with the exception of the posidonia meadows (seagrasses) which form a key input into the economic valuation. In support of this approach Austen *et al*, 2010 states that In the case of the marine environment the spatial data is less essential, as most marine environments deliver most marine ecosystem services, albeit to differing amounts.

3.2 Provisioning services

3.2.1 Food

The main food product provided by Foça SEPA is fish, which not only contributes to the local subsistence but also has an important economic value both regionally and nationally.

3.2.2 Raw materials

These products relate to the extraction of marine organisms for all purposes other than human consumption. Marine raw materials include seaweed for industry and fertilizer, fishmeal for aquaculture and farming, pharmaceuticals and ornamental goods such as shells. The provision of genetic resources, natural medicines and ornamental products at the site is unknown.

3.2.3 Transport

Outside of fishing, the waterways in Foça SEPA are used by sea vehicles especially for recreation purposes. Yatching, tours and daily boat trips are particularly active during the summer months. Around 680 nonregistered and 102 private boats of 4-20 meters, 26 commercial boats and 500 private yachts are estimated to exist in Foça according to the Port Authority (Sualtı Araştırmaları Danışmanlık 2008). Furthermore, between 50-100 unlicensed small boats (less than 5.5m) are told to exist in Foça.

3.3 Regulating services

3.3.1 Regulation of GHGs

A key service provided by marine ecosystems is their capacity to sequester carbon dioxide. The Ocean is estimated to hold about one third of all anthropogenic CO_2 emissions and has two interconnected CO_2 absorption circuits: the biological pump and its physico-chemical counterpart. At the global level, the latter has been responsible for most of the capture of CO_2 of human origin, while

[4] Many organisms provide living habitat through their normal growth, for example, reef forming invertebrates and meadow forming sea grass beds. 'These 'natural' marine habitats can provide an essential breeding and nursery space for plants and animals, which can be particularly important for the continued recruitment of commercial and/or subsistence species. Such habitat can provide a refuge for plants and animals including surfaces for feeding and hiding places from predators. Living habitat plays a critical role in species interactions and regulation of population dynamics, and is a pre-requisite for the provision of many goods and services'. (Beaumont et al 2007)

Table 2. Qualitative assessment of marine ecosystem services and benefits at Foça SEPA

ES Type	Service	Benefit / outcome	Marine Area	Sectors supported by ecosystem service	Sectors impacting / influencing the provision of ecosystem service
Provisioning Services	Food	Commercial and subsistence fish and wildlife	**	Households, Fishery, Tourism	Households, Fishery, Agriculture, Industry
	Raw materials	Industrial purposes - seaweed	-	Households, Industry (construction materials)	Households, Industry
		Natural medicines obtained from marine dependent species	?	Households	Households, Fishery, Agriculture, Industry
		Genetic resources - variety in gene pool in marine flora and fauna	?	Agriculture	Fishing, Tourism, agriculture
		Ornamental resources – e.g., shells used as jewellery, handicrafts	-	Industry	Industry, Fishing, Tourism
	Source of energy (fuel etc)	Energy provision e.g., tidal power	-	Energy, Households	
	Transport	Commercial use of waterways	*	Industry, Tourism	
Regulating Services	Regulation of GHGs	Carbon sequestration	**	Potentially all	Potentially all
	Micro-climate stabilization	Influence on temperature, precipitation, wind, humidity etc	*	Potentially all	Potentially all
	Disturbance regulation	Flood and storm protection	*	Tourism, Industry, Households/ Urban Settlement, agriculture	Potentially all
		Erosion control	*	Tourism	Potentially all
	Waste assimilation	Detoxification of pollution Water purification	*	Potentially all	Potentially all
Cultural Services	Spiritual, religious, cultural heritage	Archaeological ruins (historical not recreational value). Use of marine environment in books, film, painting, folklore, national symbols, architecture, advertising	**	Tourism, Households	Potentially all
	Educational	A 'natural field laboratory' for understanding marine processes	**	Households	Potentially all
	Recreation and ecotourism	Recreational fishing, birdwatching, hiking, diving, sailing, canoeing, Holiday destination (aesthetic views), archaeological ruins (historical not recreational value)	**	Tourism	Potentially all
	Landscape and amenity	Property price premiums	*	Tourism	Potentially all
	Biodiversity non-use	Enhanced wellbeing associated for example with bequest or altruistic motivations	*	Potentially all	Potentially all

Code: ** service important, * service provided, - service not relevant, ? uncertain of provision

the biological pump is consider still be working as it did before the dawn of the industrial age (Nellemann *et al,* 2009). The sequestration of CO_2 emitted by human activities by the physico-chemical pump (through a process of solubility), shows little dependence on ecosystem quality. However, it leads to the gradual acidification of the oceans, which will have a considerable effect on marine ecosystems and the living resources produced, particularly in the Mediterranean (CIESM 2008; Gambaiani *et al* 2009). This issue, about which little is yet known, is the subject of many initiatives currently underway (Orr 2009) and a European research programme including the socio-economic consequences is set to be launched in the near future.

At the local level, the flow of carbon from the surface towards the sediment depends on biological processes, which in turn depend on ecosystem quality (and does not lead to the acidification of the environment).

About 35-50% of the carbon production of the coastal ocean is estimated to be a result of the photosynthesis by marine macrophytes including seagrasses (Duarte and Cebrian 1996). These marine plants have a global average biomass of about 180 g C m^{-2}an average net production of about 400 g C $m^{-2}yr^{-1}$, ranking amongst the most productive ecosystemsin thebiosphere (The Encyclopedia of Earth 2011).

In the Mediterranean the matte (sheaths and rhizomes) produced by the *Posidonia* meadows store a carbon flow on a sustainable basis (several centuries), which has been estimated at 1.2 million tonnes of carbon per year (Pergent 1997). Thus the preservation or restoration of these coastal ecosystems contributes to the sustainability of this ecosystem service. The Mediterranean *Posidonia* accumulates in its subsurface large quantities of organic material derived from its roots, rhizomes and leaf sheaths embedded in often sandy sediments (Lo Iacono *et al* 2008). These organic deposits can reach up to several meters as they accumulate over thousands of years forming what is known as matte, whose high content in organic carbon plays a crucial role in the global carbon cycle (ibid). *Posidonia oceanica* is considered to be one of the most extensive coastal reservoirs of CO_2 because of the preservation of this matte along the Mediterranean coasts over time (Duarte *et al* 2005). This in-situ accumulation of large quantities of biogenic materials over millennia is an important ecological phenomenon and occurs only in few ecosystems such as peats, coral reefs and mangroves besides seagrass meadows (Mateo *et al* 1997).

Despite their global importance, there is growing evidence that seagrasses are experiencing an unprecedented level of damage and deterioration (Orth et al 2006). It is estimated that seagrass meadows are being lost due to anthropogenic ecosystem impacts at a rate of up to two football fields per hour, roughly similar to tropical rainforest conversion (Unsworth & Unsworth 2010).

The extent of *Posidonia* communities in Foça is estimated to be 6,691km^2 (personal communication, Y.Savaş and G.Kaboğlu 2011).

Posidonia can provide a range of regulating services, in addition to carbon sequestration and storage, as discussed in Box 1.

Box 1. Seagrass meadows *(Posidonia oceanica)*

Posidonia oceanica are a type of land-based flowing plant, which returned to the marine environment some 120 to 100 million years ago. They form vast underwater meadows (also known as beds) at a depth of between 0 and 50 metres in the open seas and in the brackish and saltwater coastal lagoons. *Posidonia oceanica is* endemic to the Mediterranean and a highly productive system supporting high levels of biomass (Lo Iacono *et al* 2008). Despite being endemic its distribution is restricted due to anthropogenic disturbances; their total surface area witnhin the Meditterranean is about 38,000km^2 (Mangos *et al* 2010).

Posidonia seagrass communities provide a wide range of Ecosystem Services :

- The *Posidonia* meadows are the leading Mediterranean ecosystem in terms of biodiversity provision, supporting a quarter of its recorded marine species over an area estimated to cover almost 1.5% of the seabed.
- They serve as a spawning grounds and nurseries for many commercial species and the source of major primary production, and thereby supporting the fishing industry.
- They protect beaches against erosion (by reducing hydrodynamism and by trapping sediment in the matte). The dead leaves of Posidonia oceanica found on shores act as a natural barrier reducing the energy of the waves and minimizing erosion. They also play an important role in beachanddunesystems.
- They encourage water transparency, thereby supporting tourism and providing an effective tool for monitoring the quality of coastal waters.
- They trap and absorb man-made CO_2. According to a recent report seagrasses are the most effective species in terms of long-term carbon storage (Laffoley and Grimsditch, 2009).
- They produce oxygen and are known as the "lungs of the sea" with +/- 14 lt O_2/m²/day capacity on average
- The cycle nutrients through their plant growth.
- They operate as coastal water filters. Subsurface rhizomes and roots stabilize the plant while erect rhizomes and leaves reduce silt accumulation.

Source: Based on Mangos *et al* 2010

3.3.2 Micro-climate stabilization

Oceans play a role in regulating the atmosphere and modulating weather. While it is thought that this ecosystem services is provided by Foça SEPA, there are no scientific studies defining this service at the site.

3.3.3 Disturbance Regulation

Flood and storm protection. Marine flora and fauna can help defend coastal regions by dampening and preventing the impact of tidal surges, storms and floods. This disturbance alleviation service is provided by a diverse range of species, such as salt marshes, mangrove forests and sea grass beds, which bind and stabilise sediments and create natural sea defences (Huxley, 1992; Davison and Hughes, 1998 as reported in Beaumont *et al* 2007). These natural sea defence systems protect infrastructure and investments in vulnerable coastal areas, and would need to be replaced by man-made alternatives if damaged or lost. This service is important in Turkey given the concentration of socio-economic activities on Turkey's coasts; 27 of Turkey's provinces border the sea and 30 million people live by the coast (UNDP, 2010). It is also considered important in Foça SEPA, given the communities that live along the coastline and the importance of tourism infrastructure.

Coastal erosion is a natural phenomenon widely observed in the Mediterranean, particularly in coastal zones with soft substrate. According to the European Environment Agency (EEA, 2006) 20% of European coasts are threatened by erosion (i.e. around 20 000 km).

The Mediterranean's Posidonia meadows provide protection against erosion through three main functions. Firstly, its foliage, which limits hydrodynamics by 10 to 75% under the leaf cover (Gacia *et al*.,1999). Secondly, the banquettes formed by its dead leaves and rhizomes on beaches - that can

reach a height of between 1 and 2 metres - builds a structure that protects the coastline against erosion (Guala et *al*., 2006, Boudouresque *et al*., 2006). Thirdly, the Posidonia matte traps sediment (Dauby *et al*., 1995, Gacia and Duarte, 2001), thus contributing to their stability. Jeudy de Grissac, 1984 estimated that the degradation of a one meters thickness of Posidonia duff could lead to the coastline retreating by twenty meters.

3.3.4 Waste remediation

A significant amount of human waste, both organic and inorganic, is deposited in the marine environment. This waste would required additional treatment if it were to be taken up by terrestrial systems, and therefore would entail increase treatment costs. Marine living organisms store, bury and transform many waste materials through assimilation and chemical de and re-composition (Beaumont et al, 2007). The capacity of marine ecosystems to absorb, detoxify, process and sequester waste shows a wide variation. Some toxic pollutants, such as heavy metals, cannot be converted into harmless substances, whereas some organic waste can even encourage ecosystem development through its biomass and benefit ecosystems. Marine ecosystems provide an ecosystem service for the quantity of waste below the threshold at which it becomes harmful to them (Mangos *et al* 2010).

While this service is thought to be provided by Foça SEPA, there are no site specific studies defining or quantifying this service for the site.

3.4 Cultural Services

3.4.1 Spiritual, religious and cultural heritage

The marine environment may be linked to the cultural identity of a community, or associated with religion, folklore, painting, cultural and spiritual traditions. Communities that live by and are dependent on the sea for their livelihood often attach special importance to marine ecosystems that play a significant role in the economic or cultural definition of the community (Beaumont *et al* 2007). A local legend, known as Karataş Legend (see Box 2) precisely highlights these links.

Box 2. Karataş: A Local Legend

This local legend develops around two fishermen, Panayot (a Greek) and Hüseyin (a Turk) who befriend each other during a tempest near the Orak Island as one helps the other get to the harbour safely. After some months of meeting each other, both men's wives are told to expect a baby. Eventually when they are born, Panayot's son takes the name Talasa and Hüseyin's daughter Deniz (both names meaning "sea" in respective language).

As years go by, a romantic tie develops between these two. When their fathers are out fishing, they meet secretly in the area currently known as Köprübaşı where a river flows and where there is a dark rock ("karataş" in Turkish). Eventually they reveal to their parents their love and get engaged. Talasa does not see his future in fishing and decides to go to Izmir to make a living. Deniz starts waiting for his return. Years go by but Talasa does not return. Deniz sits on the dark rock every day and day dreams but eventually she falls sick from despair, passes away and leaves her soul in Foça.

Panayot and Hüseyin rearranged the place where the dark rock was and it was their wish that whoever happens to come to Foça and step on this rock, their passion and tie for Foça becomes very strong. Since then, it is told that whoever comes to Foça and happens to step on the dark rock (its place being a mystery) their heart would settle in Foça and even if they leave, they wish to come back to Foça. From that day on, this love story and legend have been told over and over again in Foça.

Source: Foça Local History Research Center

Furthermore, the cultural heritage of Foça is prominent, the town being one of the most important Ionian settlements, named Phocaea (first Ionian evidence dating back to IX. Century B.C.). During that period, Ioania led in philosophy, architecture and sculpture. Phocaea in turn was a town of expert seamen who explored the Mediterranean and the Black Sea and conquered towns as far as Marseilles in France and Ampuria in current Spain. Phocaea therefore also became an important centre of commerce with the first gold-silver Ionian coin produced there. After the Persian invasion, the town has seen Seleucian, Pergamon, Roman, early Christian civilizations, Çaka Bey seigniory and Ottoman Empire successively.[5] Archeological digs are ongoing in Foça center trying to reveal the Athena Temple.

[5] Cultural information from Foça Municipality - http://www.foca.bel.tr/index.php?bolum=foca&alt=tarih

3.4.2 Education and research

Marine living organisms provide stimulus for education and research. Beaumont *et al* (2007) cites a number of uses of marine information including: the study of microbes in marine sediments to develop economical electricity in remote places; the inhibition of cancerous tumour cells; the use of *Aprodite* sp. spines in the field of photonic engineering, with potential implications for communication technologies and medical applications; the development of tougher, wear resistant ceramics for biomedical and structural engineering applications by studying the bivalve shell. In addition, marine biodiversity can provide a long term environmental record of environmental resilience and stress.

Foça SEPA can be considered as an important marine and terrestrial field laboratory as well. According to the Turkish Council of Higher Education, since the beginning of 1990's, over 33 Master and Doctorate level research studies have been conducted in the area[6].

3.4.3 Recreation and Tourism

Marine ecosystems provide the basis for a wide range of tourism and recreational activities, resulting in significant employment opportunities for local communities and contributions to GDP. Tourism is an important activity in Foça and closely linked to the marine environment. A range of marine related recreational activities are offered including boat tours, sailing and windsurfing.

3.4.4 Landscape and amenity

Landscape and amenity services provided by marine ecosystems attract tourists and generally make the area an attractive place to visit and live. This benefit can be captured through property price premiums in the area.

3.4.5 Biodiversity non-use

Biodiversity non-use relates to the benefits people derive from marine organisms unrelated to their use. Such benefits can be motivated by bequest values (the value placed on ensuring the availability of marine ecosystems for future generations), and existence value (a benefit derived from simply knowing that the marine ecosystem biodiversity exists).

3.4.6 Option value

Option value relates to currently unknown potential future uses of marine biodiversity and reflects the importance of more uses being discovered in the future. The biodiversity may never actually be exploited, but there is benefit associated with retaining the option of exploitation.

[6] A list of research activities can be found in Appendix 1 of Sualtı Araştırmaları Danışmanlık 2008.

VALUATION OF ECOSYSTEM SERVICES

5

In 2008, a World Bank study put the total annual figure for all marine ecosystem services at more than US$20 trillion. This estimate only accounted for the marine ecosystem goods and services for which a market already exists and is therefore considered to be an underestimate.

This section presents, where possible, monetary estimates for the ecosystem services identified in Table 2 as being present at Foça SEPA. The monetary estimates have been derived using market pricing or value transfer valuation approaches. Market price approaches include the use of market prices to value traded ecosystem services and also the so called cost based approaches. The use of **market prices** for marine ecosystem services that are traded reflect a lower bound estimate of its value, as they do not capture the consumer surplus[7] element of value. They are therefore only proxies of welfare value. However, such estimates are still very informative and relatively straight forward to derive. **Cost based approaches** take the cost of replacing a service or averting a damaging impact on a marine resource as a proxy for the value of the benefits provided by the marine environment. They suffer from the same complications as market prices and risk the under-valuation of non-market goods

Value transfer (also called benefits transfer) involves the application of values from an existing study (often called the 'study site') to a new study (often referred to as the 'policy site') where conditions are similar and a similar policy context is being investigated. Value transfer is a practical means of demonstrating the monetary value of marine benefits. It is cheap and quick relative to primary research, but there are a number of factors which influence the reliability of the transfer exercise. The quality of the original study is obviously a key consideration for value transfer applications. In order to minimize errors / uncertainty, the primary research study should be based on adequate data and a theoretically sound approach. The degree of similarity between the study site and the policy site is also a major factor. Value transfer will be more reliable if the policy

[7] Consumer surplus is the amount an individual is willing to pay above the market price. The price reflects the cost of obtaining a good, not the actual benefit derived from its 'consumption', which is equal to the market price plus consumer surplus.

site is located within the same region / country as the study site, and displays similar site characteristic (e.g. size, services and availability of and distance to substitutes). Other factors affecting the reliability of the value transfer exercise include: the reference condition (i.e., how closely the baseline at the study site matches the baseline at the policy site); the proposed change in the provision of the service (i.e., the magnitude of the change and whether the valuation is of a change in the quantity or the quality of an attribute); and the range/ scale of the commodity being valued (e.g., one site or many sites valued and physical area).

As well as providing *welfare measures* an attempt has been made to illustrate the importance of these ecosystem services in terms of the jobs they create and their contribution to local livelihoods.

The marine ecosystem services valued are – fish, carbon sequestration, protection against coastal erosion, waste treatment and tourism and recreation. Where relevant background information has also been provided on these services such as physical (quantitative) data, management structure, pressures and opportunities for development. For the regulating services (carbon sequestration, protection against coastal erosion, waste treatment) a review of relevant valuation evidence for the region is also presented.

4.1. Provisioning Services

4.1.1. Fish

4.1.1.1. Background

Foça is one of the largest fishing harbors in the Turkish Aegean (Veryeri *et al* 2001) and the district is estimated to provide 20% of the Aegean region's fish supply (IZKA 2009). This is due to the rich variety of fish species found in Foça, the proximity of the fishing grounds and the harbour (Ünal 1995). However, there are no reliable assessments of fish stocks in the region (Sualtı Araştırmaları Danışmanlık 2008). Since 1993, purse seine or trawl fishing activities and nets have not been permitted within 2 nautic miles of the coastline between Aslan Point to Deve Boynu which spreads to 9 miles[2] (Aykom 2008; Kıraç and Güçlüsoy 2008).

Foça region shows the typical characteristics of Mediterranean fisheries with multi-species and multi-gear fishing such as trawling, gillnetting, long lining, lift netting, pursue seining (Ünal 2004). With the implementation of coastal and marine conservation regulations, fishing with *trata* and *ığrıp* boats (a smaller size, traditional coastal trawlers operating between 0-10 meter depths) has been banned in Foça and the fishing activities have mostly shifted to open sea trawlers (Aykom 2008).

Based on interviews during site visits in March 2011 an estimated 77 traditional fishing boat owners (local residents) make their living exclusively from fishing activities. Usually these small boats range between 5-8 meters in length and use stationary nets, long-lines, lines and baskets (Sualtı Araştırmaları Danışmanlık 2008). The dominant Northern winds in Foça often impede the activities of the small boats, who are only able to spend approximately one third of the year at sea.

The small scale fishermen are organized under the Foça Fisheries Cooperative established in 1992, which has about 150 members. In order to be a member of the cooperative a fisherman needs to be from Foça and to pay the annual membership fee of 100 TL per person. Members benefit from use of the landing and mooring facilities at the cooperative's harbor, which is rented from the government for a 10 year period. Like the majority of fishery cooperatives in Turkey, the cooperative in Foça operates a small local market and is oriented toward being a service-maximizer to its members (Ünal *et al* 2009). The Foça Fisheries Cooperative is an active member in the Fishery Cooperative Union of the Aegean Region, thus taking part in the fisheries management of the region.

Larger scale fishing also takes places with 18 trawlers and 2 purse-seiners active in the designated zone, 2 nautic miles from the coastline. These larger boats can fish for seven months of the year; in accordance with the Turkish regulation on commercial fishing. The purse-seiners are registered in the Black Sea region; however, they winter in the Aegean region. In terms of income contributed to the local and national economy, trawl fishery is the most important fishing method in Foça (Ünal 2004). Therefore, trawlers dominate the fishing fleet and employ around

75 people (ibid). Red mullet, stripped red mullet and hake are the major fish species for trawl fisheries as there is a constant demand for them and 67% of gross revenues consist of these species (ibid).

To the detriment of the fish stocks, the trawlers and purse-seiners in Foça do not have an allowable catch quota and the catch log required for boats over 12m is not kept or monitored in an effective manner. Cooperative members interviewed in March 2011 stated that the Aegean fish species in Foça are near depletion, leaving only migratory species.

Fifty two fish species of economic interest including gilt head bream (*Sparus auratus*), sea bass (*Dicentrarchus labrax*), red porgy (*Pagrus pagrus*), grey mullet (*Mugil sp.*), whiting (*Merlangius merlangus*), red mullet (Mullus barbatus), pilchard (*Sardina pilchardus*) are found in Foça (Sualtı Araştırmaları Danışmanlık 2008). Small scale fishermen sell their catch directly to the restaurants found in Foça's main harbor known as Küçük Deniz, directly to consumers or to the Foça's local fish market where sales are carried out through a bidding process (*mezat* in Turkish) (Aykom 2008).

Red mullet (*Mullus barbatus*), stripped red mullet (*Mullus surmuletus*) and hake (*Merluccius merluccius*) are the major fish species in trawl fishery in Foça, and the demand in the market seems constant for these species (Ünal 2004). Trawlers and purse-seiners take most of their catch to the region's main wholesale fish market situated in İzmir with only a very small portion reaching the Foça local market. However, the local fish market of Foça does not have a license thus tracking the species and volumes caught is difficult and recorded data is believed to be lower than the actual catch (personal communication; Ceyhan Çetin, fisheries cooperative head 2011).

In Foça region, no previous studies examining the relations between fisheries and ecosystems have been conducted. This is a pressing necessity for the sustainability of the fishing activities as well as the conservation of threatened species (Sualtı Araştırmaları Danışmanlık 2008). Box 3 provides an overview of parakete fishing method, which is practiced in Foça.

Box 3. Parakete Fishing

Parakete or *paragat* (the word originating from Greek) is a traditional fishing method which involves the use of a multi-hooked fishing line that can extend up to 1.5 km. Different species require different *parakete* types and accordingly the number of hooks varies between 100 – 400. The line can reach a depth of 50-60 meters and the main targeted species are Gilthead seabream, white bream, corals, pagry and dentex. These fishes are generally sold directly to the restaurants in Foça.

Parakete fishing is usually undertaken in rocky bottoms and in seagrass meadows in the early morning; the line is let out around 4am and brought in at sunrise. Fresh squid is used as bait. The average income of a small boat owner who utilizes this fishing technique is around 400-450 TL/month.

One method of feeding for Mediterranean monk seals is through the capture of fish and other marine species that are caught in nets and paragat lines. Monk seals therefore damage fishing gear and the competition for fish causes a conflict between humans and the seals (Güçlüsoy 2008).

Source: Personal communication with Özer Konaş, a fisherman in Foça.

4.1.1.2. Valuation

Reliable quantitative data on fish catch and stocks in Foça remains a challenge due to the lack of systematic record keeping and data collection at both the cooperative and government level. The valuation presented here draws on a number of sources including studies of Foça's overall fishery (Aykom 2008), the economic viability of trawlers (Ünal 2004) and of the fish cooperative (Ünal & Franquesa 2010).

According to 2001 data, the total amount of fish catch in Foça amounted to 156.6 tons (Aykom 2008). Based on 1999-2000 data, the trawl fishing fleet of Foça spent 182 days fishing and the total value of the production amounted to US$2 million

(Ünal 2004). For small-scale fisheries in Foça, the net cash flow of an average vessel is identified as about US$23,000 for the 2002-2003 fishing season (Ünal & Franquesa 2010). However, falling stock populations is stated as one of the most alarming issues in Foça SEPA's socio-economic report with 87.5% of respondents confirming that their income has been affected (Aykom 2008).

Table 3 presents fisheries data for the Foça region as a whole, obtained during a site visit for the project in March 2011.

Table 3. Volume of Fish Caught in Foça Region in 2010, by species (Foça Fisheries Cooperative & Foça Agriculture & Fisheries Department)

Fish type	Amount caught (kg/year)	Percentage of total catch (%)	Lower Bound Sale price (TL/kg)	Upper Bound Sale price (TL/kg)	Lower Bound Revenues (TL)	Upper Bound Revenues (TL)	Average Revenues (TL)
Pilchard (*Sardina pilchardus*)	900 000	42%	1	4	900 000	3 600 000	2 250 000
Anchovy	800 000	37%	2	5	1 600 000	4 000 000	2 800 000
Horse mackerel (*Trachurus sp*)	120 000	6%	3	15	360 000	1 800 000	1 080 000
Bogue (*Boops boops*)	100 000	5%	2	4	200 000	400 000	300 000
Annular seabream	30 000	1%	1	2	30 000	60 000	45 000
Blotched picarel (*Spicara maena*)	30 000	1%	2	4	60 000	120 000	90 000
Grey mullet (*Chelon labrosus*)	20 000	1%	8	20	160 000	400 000	280 000
Salema	20 000	1%	2	3	40 000	60 000	50 000
Octopus (*Octopus vulgaris*)	20 000	1%	7	15	140 000	300 000	220 000
Striped red mullet (*Mullus surmuletus*)	18 000	1%	12	35	216 000	630 000	423 000
Sole (*Solea solea*)	12 000	1%	15	70	180 000	840 000	510 000
Red mullet (*Mullus barbatus*)	11 000	1%	25	70	275 000	770 000	522 500
White bream (*Diplodus sargus*)	9 000	0,42%	15	40	135 000	360 000	247 500
Poor cod	9 000	0,42%	10	15	90 000	135 000	112 500
Red porgy (*Pagrus pagrus*)	5 000	0,23%	15	40	75 000	200 000	137 500
Mackerel (*Scomber scombrus*)	5 000	0,23%	15	25	75 000	125 000	100 000
Garpike	5 000	0,23%	5	10	25 000	50 000	37 500
Squid	5 000	0,23%	15	30	75 000	150 000	112 500
Shrimp (*Penaeus kerathurus*)	5 000	0,23%	25	70	125 000	350 000	237 500
Seabass (*Dicentrarchus labrax*)	3 000	0,14%	25	35	75 000	105 000	90 000
Gilthead seabream (*Sparus aurata*)	3 000	0,14%	25	50	75 000	150 000	112 500
Bonito (*Sarda sarda*)	3 000	0,14%	25	50	75 000	150 000	112 500
Swordfish	2 000	0,09%	15	30	30 000	60 000	45 000
Saddled seabream	2 000	0,09%	15	25	30 000	50 000	40 000
Total	2 137 000	100			5 046 000	14 865 000	9 955 500

Data provided by the cooperative and the local MARA authorities point to an annual marine catch of 2,137 tonnes. This catch volume includes the fish harvested by trawlers, purse-seiners as well as smaller scale coastal fishermen in the region. However, since fishermen usually seem to adjust their real costs and earnings in ways that do not show up in normal accounting mechanisms (Ünal 2004), this is thought to be an underestimate.[8] Furthermore, it is important to underline that these figures do not reflect any of the costs of the fishing vessels. Significant differences can be observed in the upper and lower bound sales prices of certain species due to their scarcity and other fluctuations throughout the fishing seasons.

Recreational fishing is also carried out throughout the year in Foça, the demand for which is reported to be increasing in the region (based on interviews). Amateur recreational fishing activities are not organized; however, around 400-500 amateur or recreational fishing boats are estimated in the SEPA (Sualtı Araştırmaları Danışmanlık, 2008). Amateur fishing in Foça appear not to be carried out as an economic activity (Ünal 2001); a daily quota of 5kg is set per fisher. However, it is foreseen that their activities will place an additional pressure on the fish stocks of the region (Sualtı Araştırmaları Danışmanlık, 2008).

Depending on the weather, recreational fishing outings often take place on weekends. They can be organized either through a small fisherman's boat or the daily excursion (commercial) boats. In the former case, 4 people can be taken out (excluding the boatman) for 100TL. In the latter case, customers pay 30TL/person for a daily fishing excursion, the boats can also be rented on an hourly basis. All members of the boat cooperative (26) offer recreational fishing trips during 6 months of the year (from September to mid-March). Based on field interviews, 400-500 people come to Foça per weekend for this activity. There appears to be competition between the two providers of this service and generally this activity needs to be regulated, especially in light of the increasing demand and concerns over the viability of fish stocks.

[8] Based on field interviews, fishermen only report 1/4th of their full catch.

4.1.1.3. Economic Impact

About 30% of Foça's population is estimated to earn their income from fishing activities (personal communication; Ceyhan Çetin, fisheries cooperative head, 2011). As stated in 4.1.1.1, in terms of income contributed to the local and national economy, trawl fishery is the most important fishing method in Foça (Ünal 2004). The same study suggests that trawl vessels can generate around US$2 million per fishing season. Despite the fact that these boats contribute well to the local and national economy, only 11 of the 20 trawl vessels were profitable in 1999-2000 fishing season (*ibid*). The main challenges facing the fisheries in Foça are over-fishing and decreasing income levels of the fishermen which could be improved via local, decentralised fisheries management, more efficient cooperatives and limited access to fishing grounds (Ünal 2001).

Table 4 compares the socio-demographic and economic characteristics of small-scale fishermen in Gökova SEPA and Foça SEPA. The results for 2002-3 are based on Ünal *et al* (2010) and those of 2008 are based on surveys in September and October 2008 under the SMAP project (SMAP, 2010). The average age of the coastal fishermen in Foça is 48. The number of fisherman for whom fishing is their main occupation is 53% (lower than the areas in Gökova SEPA).

Table 4. Socio-demographics and economic characteristics of small-scale fishermen

Fishery Co-operative	Akyaka		Akçapınar		Gökova	Foça
	2002-3	2008	2002-3	2008	2008	2002-3
Mean age of fishermen	43	42.4	45	51	45	48
Professional fishing years (mean)	23.4	20.2	23.5	29	22.6	26.2
Size of household (mean)	4.4	3.1	4.3	2.9	3.1	4.1
Dependent family members (mean)	2.4	2	2.6	1.9	2	2.5
Fishery as main occupation (%)	95	76	100	57	69	53
Fishery as sole income source (%)	63	60	46	64	62	34
Covered by social security (%)	58	48	77	79	59	37
Home owner (%)	62	40	8	79	54	40
Married (%)	77	72	89	87	77	95

Source: Ünal 2010 and Annex 4 SMAP (2008 average figures for Akyaka and Akçapınar)

Ünal *et al* (2010) generated information on the costs and earnings of the capture fisheries from personnel interviews (32 in Foça, 19 in Akyaka and 26 in Akçapınar). This information is not collected on a regular basis by the relevant Turkish authorities. Data was collected on operational costs including – vessel costs (vessel and gear repair, maintenance expenses and vessel insurance), labour costs (wages) and running costs (fuel, lubricating oil, ice, bait, food and supplies for crew), and capital costs covering opportunity cost and depreciation.

The results are summarized in Table 5 and show that 56% of vessels in Foça, 16% in Akyaka and 65% in Akçapınar faced negative gross cash flow. In 2001, 57% of fishing vessels showed positive net flow, compared to 44% in the 2002-3 fishing season. This is not surprising, as in 2001 it was reported that Foça fisheries would not remain profitable unless the increasing fishing efforts was controlled (Ünal, 2001). Ünal *et al* (2010) concluded that the livelihoods of the small scale fishing sector is threatened by irregular and relatively low income levels.

Table 5. Economic / Financial Results of Small Scale Fishing

	Total earnings	Net cash flow[1]	NP/TE (%)[2]	ROI (%)[3]	TC/TE (%)
Foça	133,011	22,928	17.2	26	83
Akyaka	144,982	64,500	44,5	160	55
Akçapınar	75,779	-20,084	-26	-27	127

Source: Ünal, 2010
Notes: [1]Economic performance was determined by net cash flow (NCF) (or net profit (NP)) calculated as the value of landings minus costs; [2]NCP/total earnings (TE) ratio- expresses net profit as a percentage of TE. A ratio of more than 10 can be considered good (Tietze et al, 2005). [3]Financial performance was measured by NCF/investment ratio, also referred to as the ROI. A level of 10% is generally considered to be a good result.

Based on field interviews in March 2011, the average revenues of a small line fishing boat (6 m) is 450 TL per month and due to weather conditions fishing is only possible 4 months of the year. This implies an annual revenue of less than 2,000 TL (or 1,250€). For 2010, daily gross income of a trawler, on the other hand, is reported to be between 800-900TL on average (personal communication; V. Ünal, 2011). The costs of a small fishing boat are summarized in Table 6.

Table 6. General costs of a small fishing boat in Foça

İtem	Cost (TL)
Maintenance (twice annually)	600-800
Engine (every 2-3 years)	500
Petrol (weekly, 8 liters)	60
Fishing equipment such as lines, hooks (frequency undetermined)	20

Source: field interviews

Furthermore, a study by Kaboğlu (2007) has assessed the annual and spatial revenues of fishing, tourism and commercial boats based on 2004 data. The study reports that fishing has the lowest economic return on unit area while tourism has the highest added-value.

4.2 Regulating Services

4.2.1 Carbon sequestration

4.2.1.1 Existing estimates

Mangos *et al* (2010) estimated the carbon storage function of the Mediterranean Sea as a whole and based on this provided disaggregated values for individual Mediterranean countries. The Mediterranean Sea accounts for only 0.8% of ocean area, therefore it plays a small role in world climate regulation. However, a recent estimate (Huertas 2009) proposes the value of 78 kilo moles of carbon ±15% per second for the Mediterranean Sea as a whole. This corresponds to an annual average rate of anthropogenic CO_2 sequestration of 11.8t/km²/yr, which is around twice the average for the World Ocean (Gruber 2009).

Adopting Huerta's (2009) estimate, Mangos *et al* (2010) estimate the total sequestered volume for the Mediterranean at 108 million tonnes of CO_2 per year[9]. This quantity represents a mere 5% of the CO_2 emitted by activities in the Mediterranean riparian countries (UN Data).

[9] One tonne of carbon corresponds to 11/3 or 3.67 tonnes of CO_2

The average price for carbon for the year 2005 was used - 20.5€/t of CO_2 (World Bank, 2006). This results in an annual regional value: 108Mt x 20.5€/t = 2.2 billion Euros. This value is distributed amongst the riparian states based on their share of the total volume of CO_2 emitted using statistical data provided by UN Data. The value for Turkey is estimated at 230 million Euros per annum. This provides a ball park estimate of the value of marine carbon sequestration in Turkey generally. Available site specific data and current carbon values were used to estimate this service at Foça SEPA.

4.2.1.2. Value of carbon sequestration at Foça SEPA

In Foça SEPA, Mediterranean seagrass communities have been studied by the Underwater Research Society, SAD. No data has been collected to date on the depth of the soil and sediment layers where the species are encountered. However, *Posidonia* meadows were found to occur across the marine and coastal protected zone as shown in Figure 3. The coverage of the *Posidonia* communities in Foça extend to some 6,691km^2 (personnal communication, Y.Savaş and G.Kaboğlu 2011).

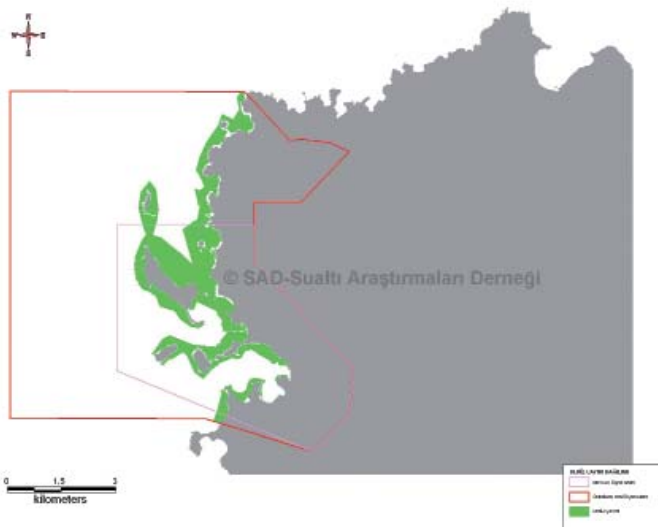


Figure 3. Distribution of Posidonia oceanica in Foça SEPA (Sualtı Araştırmaları Derneği).

A number of global and regional studies have measured the carbon storage of *Posidonia* species both in its biomass (including aboveground and belowground vegetation) and its soil organic carbon. For instance, the estimates available of soil organic pools under *Posidonia oceanica* beds have been published based on samples of the vertical matte walls of the meadows at seven heavily vegetated Mediterranean sites (Mateo *et al* 1997). This estimated a matte/sediment storage capacity of 2.1 t CO_2/ha/yr. Duarte *et al* (2010) carried out a meta-analysis for the net community production of different seagrass species globally and estimated the aboveground carbon sequestration rate to be in the range of 32.5 t CO_2/ha/yr, assuming an average dry weight of 672g/m^2 (average depth of 5 m).

For the purposes of this study global averages defined both for the living biomass and the soil organic carbon by the Nicholas Institute for Environmental Policy Solutions at the Duke University have been adopted (Table 7). This study demonstrates that the biggest carbon pool for *Posidonia oceanica* lies in the soil organic pools, with a global average of 500 t CO_2/ha.

Table 7. Global averages and standard deviations of the carbon sequestration rates and global ranges for the carbon pools by habitat type

Habitat Type	Annual Carbon Sequestration Rate (tCO_2 eq/ha/yr)	Living biomass (tCO_2 eq/ha)	Soil organic carbon (tCO_2 eq/ha)
Seagrass	4.4 +/- 0.95	0.4 –18.3	66–1,467
Tidal Marsh	7.97 +/- 8.52	12–60	330–4,436
Estuarine Mangroves	6.32 +/- 4.8	237–563	1,060
Oceanic Mangroves	6.32 +/- 4.8	237–563	1,690–2,020

Source: Murray et al 2010

While carbon credit markets do not yet cover projects related to the marine environment it is highly likely that markets for 'Blue' Carbon will emerge in the future. This is discussed in more detail in Section 6. An estimate of creditable carbon can be derived for seagrasses associated with their avoided loss.

Removal of seagrass results in the release of previously stored $C0_2$ from both biomass and soil and an end to the annual carbon sequestration function. The total creditable carbon is therefore equal to the release of stored carbon over a relevant timeframe plus the annual carbon sequestration rate.

By using the market price of carbon, it is possible to calculate the value of creditabale carbon, associated with their avoided loss. A lower bound of US$11.2/tCO$_2$ eq was adopted based on the average price of traded carbon on the voluntary markets in Turkey in 2010 (Peters-Stanley *et al* 2011) and an upper bound of US$20/tCO$_2$ eq (based on EU Emission Trading System (ETS)).

Table 8 presents the results of the analysis. The carbon value of Foça's posidonia meadows is estimated at US$408,218 – 728,960 a year (US$609-1,088 / ha), with a present value of US$2,916,541 – US$5,208,204. This assumes that soil carbon is released at 50 tCO$_2$eq/ha/yr, over a period of 10 years, and is based on a 10% discount rate. The monetary value of this service will fluctuate depending on the price of carbon, and the discount rate used in the analysis. It should be stressed that these values are based on a market existing for 'blue' carbon, the site being able to generate verifiable site specific estimates of current carbon storage and sequestration functions, and ensuring the site's long term protection and maintenance.

Table 8. The carbon value of Foça's *Posidonia* meadows

Posidonia surface (ha)	Carbon sequestration† (tCO$_2$eq/ha/yr)		Soil carbon released†** (tCO$_2$eq/ha/yr)		Total Annual carbon loss per site (tCO$_2$eq)
670	4,4		50		36,448
Value α (US$11.2 / tCO$_2$eq)			Value ‡ (US$20 / tCO$_2$eq)		
Annual value US$/ha	Annual Value / US$	PV (10 years, 10%), US$	Annual value US$/ ha	Annual Value / US$	PV (10 years, 10%), US$
609	408,218	2,916,541	1,088	728,960	5,208,04

† Based on Duarte et al 2010 & Murray et al 2010
** Assuming a 10 year release period of soil carbon after habitat destruction
α Lowerbound $11.2/tCO2 eq (based on Voluntarily traded av. prices for Turkey in 2010)
‡ Upperbound $20/tCO2 eq (based on EU ETS)

4.2.2 Protection against coastal erosion

4.2.2.1 Existing estimates

Mangos *et al* (2010) estimated the benefits of coastal erosion protection provided by marine ecosystems using the expenditure avoided approach. The following three steps were undertaken:

- **Determining the length of built-up coastline that could benefit from protection**. Since the density of coastal urbanization was not available for all Mediterranean countries, a 20% erosion figure established for the European coasts was used along with an estimate urbanization coefficient of 80%. On this basis it emerges that coastal erosion is affecting 16% of the Mediterranean coasts, i.e. 7,360 km.
- **Assessing the presence of effective Posidonia meadows** along the built-up and eroded coastline identified in step 1. Pasqualini *et al.* (1998) estimated that the Posidonia meadows covered some 35,000 km² in the Mediterranean. Given the size of the 0-50 m bathymetric section in which this plant can thrive, it would thus cover some 40% of the benthic area corresponding to 0-50 m depth. As Posidonia tends to be abundant in areas with soft substrate (which represent about 50% of the coast), and given the geographical dispersal of Posidonia, it is estimated that 90% of the Posidonia meadows are established in coastal zones threatened by erosion. The provision of an effective protection service against erosion depends on various characteristics such as the size of the meadow, its maturity and the intensity of the erosion affecting the coast. Using the estimate that over 10% of the European coasts demonstrate the existence of protection mechanisms against erosion (EEA, 2006) and assuming that 50% of the Posidonia meadows provide an effective protection against erosion at the regional level it is estimated that 3,312 km of Posidonia meadows provide an effective protection service against coastal erosion.
- **Monetary assessment of the value of the protection provided**. It is assumed that the economic value of these benefits is equivalent to the expenditure avoided (investment and

maintenance costs)[10]. In 2001, expenditure on coastal erosion defence observed along European coastlines amounted to 3.2 billion Euros. It can thus be estimated that European spending on erosion defence amounts to about 160,000€ per km of coastline.

At the regional level, the valuation shows that the Posidonia meadows allow the riparian countries to avoid annual spending of about 530 billion €/yr, covering investment and other costs (i.e. maintenance costs). For Turkey the value is estimated at 60 million euro per annum. This is a crude estimate based on the length of the coastline and a default unit value of 160,000€ per km of coastline. It does not reflect the risk of erosion or the site specific expenditure that would be needed to protect areas at risk.

4.2.2.2 Valuation of erosion control at Foça SEPA

There are no site specific studies of the risks faced by Foça SEPA's coastline or the role *Posidonia* meadows play in defending the coastline against erosion or estimates of expenditure on protection activities or infrastructure.

The total length of coastline with *Posidonia* beds is estimated to be 45.19 km including the islands within the SEPA (personal communication, Y.Savaş and G.Kaboğlu 2011). Using a transfer value of 160,000€ per km of coastline (Mangos et al, 2010), the value of protection against coastal erosion is 7,230,400 € (or 11,018,560 USD) per year. Around 52% of the coastal areas in Foça SEPA or 11.92 km is estimated to be occupied by man-made structures (human settlements, hotels, coastal facilities such as piers, docks and roads (Figure 4) (personal communication, Y.Savaş and G.Kaboğlu 2011). A conservative estimate of the erosion protection service offered by *Posidonia* meadows would be 3.76 million € per year (or 5.26 million USD).

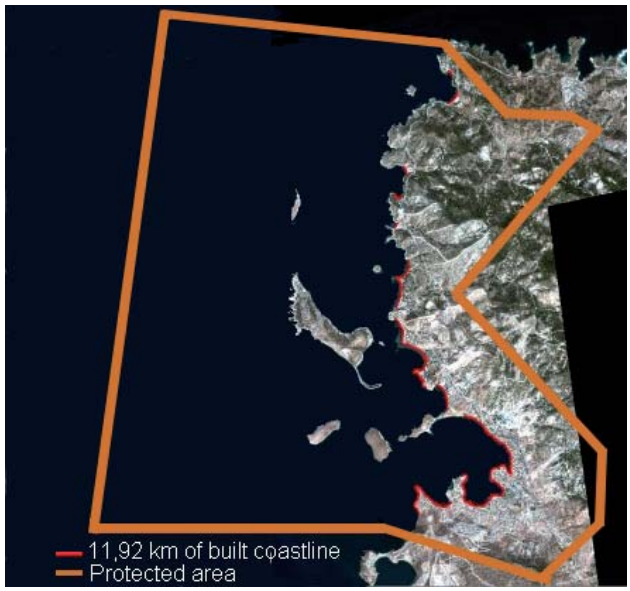


Figure 4. Extent of built-up coastline in Foça SEPA (source: Y.Savaş and G.Kaboğlu)

4.2.3 Waste treatment

4.2.3.1 Existing estimates

Mangos *et al* (2010) considered the liquid waste produced by human activities, which is the main pollutant of the marine environment. The 'combined approach' is recommended for wastewater treatment by the European Commission (EC) and MEDPOL (MEDPOL, 2004). This is based on the emission threshold for waste and a quality objective for the receiving environment. However, some waste is still inadequately treated such as diffuse waste, for which no viable treatment solution has been found and due to the limits of the treatment techniques applied for example.

Mangos *et al* (2010) value this service on the basis of an environmental tax. Such a tax would allow environmental costs to be included in water pricing, and is in line with the EC's Water Framework Directive (EU_WFD, 2000/60/CE) which requires EU members to introduce water pricing policies which reflect both financial and environmental costs. In France, these taxes are levied by the Water Agencies and are based on the specific situation and usage (domestic or non domestic pollution, diffuse pollution or breeding). In 2005 the environmental tax for domestic use at the department

[10] This expenditure breaks down as 53% for new investment, 38% for maintenance and 9% for the purchase by the public authorities of property threatened by coastal erosion (EC, 2004).

of the Bouches du Rhône, stood at 0.18€/$m^{3.}$ This zone is considered to be representative of the French Mediterranean seafront and features both highly urbanised and industrialised sectors (Marseilles, Fos) and other protected ones (Camargue, Calanques). This is used to value the waste assimilation service provided by marine ecosystems across all the Mediterranean riparian states.

In 2005 the Mediterranean coastal population stood at about 148 million (adapted from Attané and Courbage, 2001). Average domestic water consumption for these countries stands at 99 m^3/yr per inhabitant (FAO Aquastat 2000). Given that 35% of the Mediterranean population lives in coastal areas, and assuming an identical *per capita consumption*, water consumption is estimated in coastal areas at 14.5 km^3 per year. At the regional level, the value of the service for domestic consumption is estimated at 2.6 billion Euros. The value of this service for industrial use is based of the volume of industrial water discharged directly into the Mediterranean sea, as assessed by MEDPOL, (in *Blue Plan 2005, statistical appendix*), i.e. 557 million m^3 per year (or 0.56 km^3/yr) and evaluated on the same basis as for domestic consumption at 0.18€/m^3, i.e. 100 million Euros. The total value for the service is therefore estimated at 3 billion Euros (excluding agriculture).

The value of waste treatment per country is calculated on the basis of the estimated consumption per country of domestic water by the coastal populations and discharge of industrial water into the Mediterranean Sea, breaking down the overall assessment of the benefit by country according to the method described. The value for Turkey is estimated at 229 million Euro per annum.

The absorption by marine ecosystems of toxic substances (heavy metals, organic pollutants, persistent organic pollutants) or the treatment of recyclable substances such as nutrients beyond the reprocessing capability of these ecosystems should not be counted as a service. Therefore the service is limited to the treatment of recyclable matter, within the limits of these ecosystems' capacities. It was assumed that the limit is not exceeded when waste is treated using the combined approach. This waste treatment service is valued on the basis of a tax paid in order to consolidate and perpetuate a situation which is already acceptable from an environmental point of view.

4.2.3.2. Valuation at Foça SEPA

Mangos *et al* estimated the value for Turkey at 229 million Euro per annum. The total length of the Turkish coastline including the islands is 8,333 kilometres. Total length of Foça SEPA is 23 km (or 0.3%). This suggests that 0.63 million Euros per annum can be apportioned to Foça SEPA's waste assimilation service.

4.3 Cultural Services

4.3.1 Recreation and Eco-tourism

4.3.1.1 Background

Relatively speaking, the tourism revenues of Northern Aegean do not compete with those of Southern Aegean and the Mediterranean in Turkey (Yanardağ & Yanardağ 2009). İzmir province contributes only by 4% to the tourism revenues in Turkey (ibid). Nevertheless, Foça is one of the leading tourism destinations in the province. Data on the number of overnight tourists across 2002-2007 classifies Foça as the 5th among İzmir's districts. The same study identifies the main attraction points Foça as the sun, sea, beach and cultural tourism.

Even though tourism revenues in the province remain modest, locally tourism is a crucial economic activity dating back to the 1960's when one of the first holiday village style foreign tourism operators in the country, the French Club Med, was established in Foça (see Box 4). Foça is a traditional Turkish holiday resort whose population is said to increase five folds during the high season when predominantly Turkish citizens occupy their summer residences (Sualtı Araştırmaları Danışmanlık 2008). The proximity of the district to Izmir, to important archeological sites such as Pergamon and Ephesus, as well as the Greek island of Lesbos makes it especially attractive for daily visits on weekends.

Box 4. The rise and fall of Club Mediterranée in Foça

The French chain **Club Mediterranée** opened its first establishment in Foça in the 1960s. This was the first foreign tourism investment in Turkey. The site covered some 450 ha with a bed capacity of 700, and was one of the most important tourism establishments in the Aegean region welcoming at least 10,000 tourists per year. The Club Med employed 150 people and around 1,500 people in Foça have retired following years of service with the company.

Foça Club Med, a business-tenant of the Turkish Retirement Fund since 1967, was taken over in 2005 due to privatization. The fund sold the facility to the highest bidder, for $8.2 million; however, the sale did not get approval, and the facility was handed over to the Finance Ministry. Since then this holiday village has been left to its fate, buildings have fallen into ruin and the garden has been overrun by weeds. The closure of the resort is associated with a significant fall in tourist numbers locally, affecting restaurants, transportation and other local businesses. According to the representatives of the local transportation cooperatives, at least three charter buses per week (about 140 foreigners) were previously coming to Foça during the high season, now reduced to the single day visitors from İzmir.

Source: Field interviews September 2010 & March 2011

The coasts and bays of Foça SEPA are primarily used for tourism and recreation purposes (see Figure 5). The coastal establishments include hotels, camping sites, social units or beaches for various designated uses (e.g., some are strictly confined to military or state employees). Five beaches in the SEPA have Blue Flag status, an indicator of beach and seawater quality standards. The historical Greek houses in Foça and the archaeological heritage are also points of attraction. There are also underwater archaeological ruins within the SEPA; thus diving remains prohibited.

1. Jandarma Komando Okulu Sosyal Tesisi (1)
2. Kartdere Köyü Acar Kamping (SS. İmbat Obası Yapı Koop)
3. Kosova Kamping
4. Club Maccarel Foça Port
5. People Kamping
6. Foça Tatil Köyü (Club Med)
7. Hanedan Otel
8. Teras Otel
9. Remzi'nin Yeri[(1) Remzi'nin Yeri, (2)Rota Cafe, (3) Ferah Kamping]
10. Neilson Club Fokai
11. Tarım ve Köyişleri Bakanlığı Eğitim ve Dinlenme Tesisleri
12. Club Şamata [(1) Club Şamata, (2) Havana Beach Club, (3) Melis Cafe]
13. Hotel Leon
14. İngiliz Burnu ve İncir Adası
15. İngiliz Burnu ve Yazlık Konutlar Önü
16. Jandarma Komando Okulu Sosyal Tesisi (2)
17. Kumsal Otel Önü
18. Belediye Sosyal Tesisi (1)
19. Vertigo Cafe
20. Balıkçı Barınağı Arka Cephesi
21. Belediye Sosyal Tesisi (2)
22. Askeri Lojmanlar Sosyal Tesisi
23. Kale Kamping

Figure 5. Location of tourist facilities in Foça SEPA

There are 33 tourist establishments offering accommodation in Foça with a total bed capacity of 2,415 (Sualtı Araştırmaları Danışmanlık 2008). Of these institutions seven are licensed by the Ministry of Culture and Tourism and have a total room capacity of 333 and bed capacity of 686 respectively. The rest of the tourist establishments either have a municipality license (Izmir Governorship 2011) or they simply operate without a license. Since the summer of 2011, the local Foça SEPA office has started implementing a coastal utilisation fee programme to the appropriate private establishments or operators to generate funds for their conservation efforts (see section 4.3.3).

4.3.2. Tourism Survey

Data on the tourist numbers, duration of their stay, composition and expenditure patterns, and occupancy rates specific to the site is not available from official or published statistics. A tourism survey was therefore carried out in Foça SEPA June 24 to 1 July 2011 to derive this information. The survey aimed to generate information on expenditure that could be used to estimate the value of tourism at

the site as well as visitors' views on their tourism experience and management of the area. In addition to visitors (192 surveys), 17 tour operators, 22 hotels and 26 restaurants were interviewed to understand the demand for their services, their profitability and the challenges that they face.

A team of 4 conducted the surveys. The survey was field tested on the 23rd June at the Kale Camping and Municipality Social Zone Number 2 situated in the South of the SEPA. Following the field testing the survey instrument was adapted in order to try and prevent misunderstandings by both interviewees and the interviewers. The final survey instrument is provided in Appendix 2.

The survey is made up of four sections covering: visitors, local tour operators, restaurant representatives and establishments offering accommodation. For the visitor survey a random selection process was adopted whereby every third person at the local beaches and other coastal utilisation zones was approached. Restaurants, hotels and tour operators (which mainly consisted of daily boat tours) were also randomly selected from the tourism core zones (for example, every two restaurants at Küçük Liman in Foça town center). Since Foça SEPA is a relatively small MCPA, the majority of the camping zones and main hotels have been surveyed (22 out of 33 hotels/campsites in Foça or 66%).

The survey interview programme is detailed in Table 9 and the results of the surveys are given below.

Table 9. Survey Programme for Foça SEPA - June and July 2011

Date	Survey Zones and Target Groups
24 June 2011	Restaurants, hotels, boat tour operators and Turkish/foreign tourists in Foça Center + Teras & Leon Hotel owner/operators and tourists
25 June 2011	North of Foça SEPA – day visitors in Kartdere Bay (Acar Camping) and Mackerel Hotel
26 June 2011	Visitors participating in daily boat tours at Foça center
27 June 2011	Neilson Club Phokai and Hanedan Hotel's customers and operators + campers
30 June 2011	Mersinaki Bay (Remzi's Spot, Rota Café, Ferah Camping, Melis Café, Club Şamata, Havana Beach Club customers and owner/operators)
1st July 2011	Municipality Social Zone Number 2 and Vertigo Café customers and operators

4.3.2.1. Visitor survey

The tourists' expenditure survey was conducted with 192 people; however, 32 surveys were discarded because they were not completed properly or reported inconsistent findings, or because respondents were home owners staying over an extended time in the area and therefore could not be considered to be tourists (e.g., people who worked in Foça half the year etc). This resulted in a sample size of 160.

The nationality of those surveyed is summarized in Figure 6. Around 76% of visitors are Turkish nationals. Of foreign visitors 38% are from Norway, 37% from the UK, with the remainder from other European countries including Ireland, the Netherlands, and Scotland.

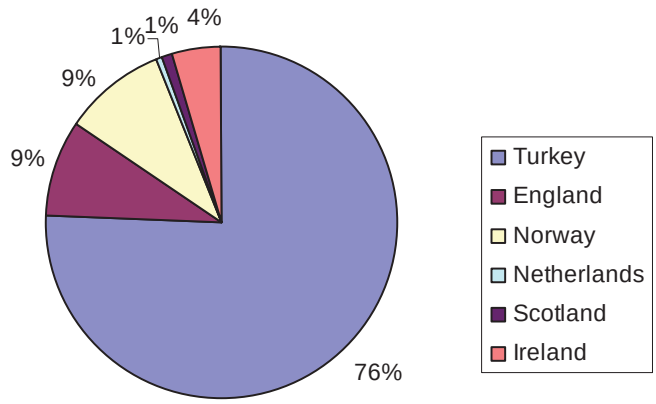


Figure 6. Nationality of visitors to Foça SEPA (Source: Tourism survey 2011)

The gender distribution of the sample was 54% males and 46% female. The age distribution was as follows: 32% of interviewees were between 36-45 years of age, 26% between 26-35 years, 19% between 46-55 years, 13% between 56-65, 6% between 18-25 years and 4% over 65 years.

For Turkish interviewees monthly income ranges of respondents were: 1,500-2,500 TL (28%), 2,500-3,500 (22%), 650-1,000 TL (19%), 1,000-1,500 TL (17%), 3,500 TL or more (145)[11]. The results suggest that the nationals visiting Foça SEPA primarily represent the middle income socio-economic group.

The monthly income levels of the foreign visitors were as follows: 34% earned between 5,000-6,500

[11] Note that 2 people or 1.6% of the Turks refrained from answering this question.

€, 32% more than 6,500 € per month, 18% between 1,500-3,000 € and 16% between 3,000-5,000 €. There were no respondents from the less than 1,500 € category. One foreign visitor, a student, did not respond to the question. The majority of foreign visitors to Foça (66%) represent the higher range income levels, earning over 5,000€.

In terms of educational attainment, 9% of respondents had a Masters degree, 46% had attended university, 26% high school and 18% primary school.

Overall 33% are first time visitors to Foça. Among Turkish visitors, 19% of them (or 23 people) were coming to the site for the first time while among the foreign visitors, nearly 77% of them were first time visitors (30 people). This demonstrates a high percentage (80%) of return visits by Turkish tourists and the importance of maintaining the qualities of the site that most attract tourists, such as its natural beauty.

Around 36% are single day-visitors, all of which were Turkish nationals. Furthermore, 81% of these day trips were return visitors implying a consistent visiting cycle, especially at weekends. Around 22.5% of the sample had come to the area as part of a package tour and 97% of the package tours attract foreign visitors (only one Turkish visitor was visiting Foça as part of a package tour).

Fifty percent of the sample was aware of Foça's conservation status as a marine and coastal PA. This awareness of the site is gained through a variety of means including: local news (15 people); media and TV (15 people); the grapevine/friends (10 people); the monk seals and NGOs who do monk seal conservation (8 people); sailing activities (7 people); internet (4 people); tourism guides (3 people); hotels (3 people); coastal security (3 people); through prohibitions (2 people); and the local municipality (2 people). Others channels also mentioned include fishing/diving activities, local tourism office and information boards

The majority of the visitors rate their tourism experience in Foça SEPA as "good" (33%) while 25% rate it as "satisfactory", 24% as "excellent." The remaining 18% rate it as "poor" (see Figure 7).

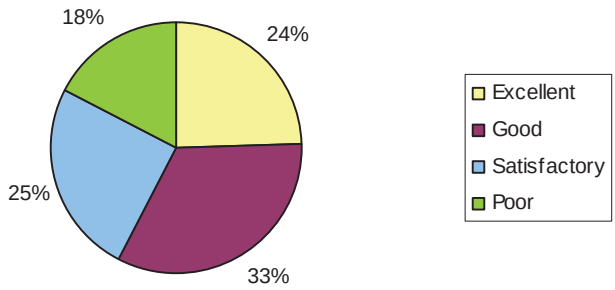


Figure 7. Quality of the tourism experience in Foça SEPA (Source: Tourism survey 2011)

The main characteristics of Foça perceived as points of attraction have been categorized and ordered according to the number of times these were mentioned by respondents (Figure 8).

The dominating positive characteristics of the SEPA are its seas, beaches and the overall coastal experience. This is followed by the calm and quietness of the area with its low impact tourism and the natural and scenic beauty of Foça and its islands (including the monk seals). The fact that Foça is a small historical town is another aspect that is appreciated by the visitors. Furthermore, the weather in Foça, especially favorable winds for water sports, is seen as a positive trait.

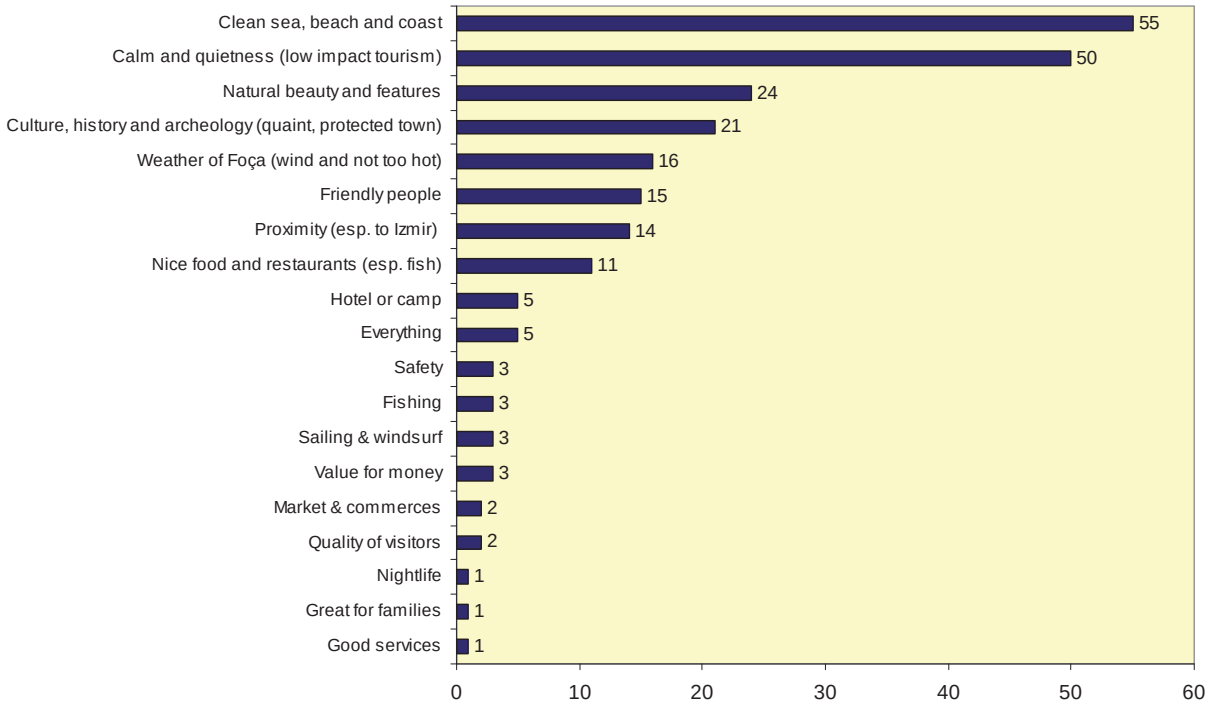


Figure 8. Views reflecting what the visitors like in Foça SEPA

On the other hand, the features that visitors do not like about Foça are summarized in Figure 9 below:

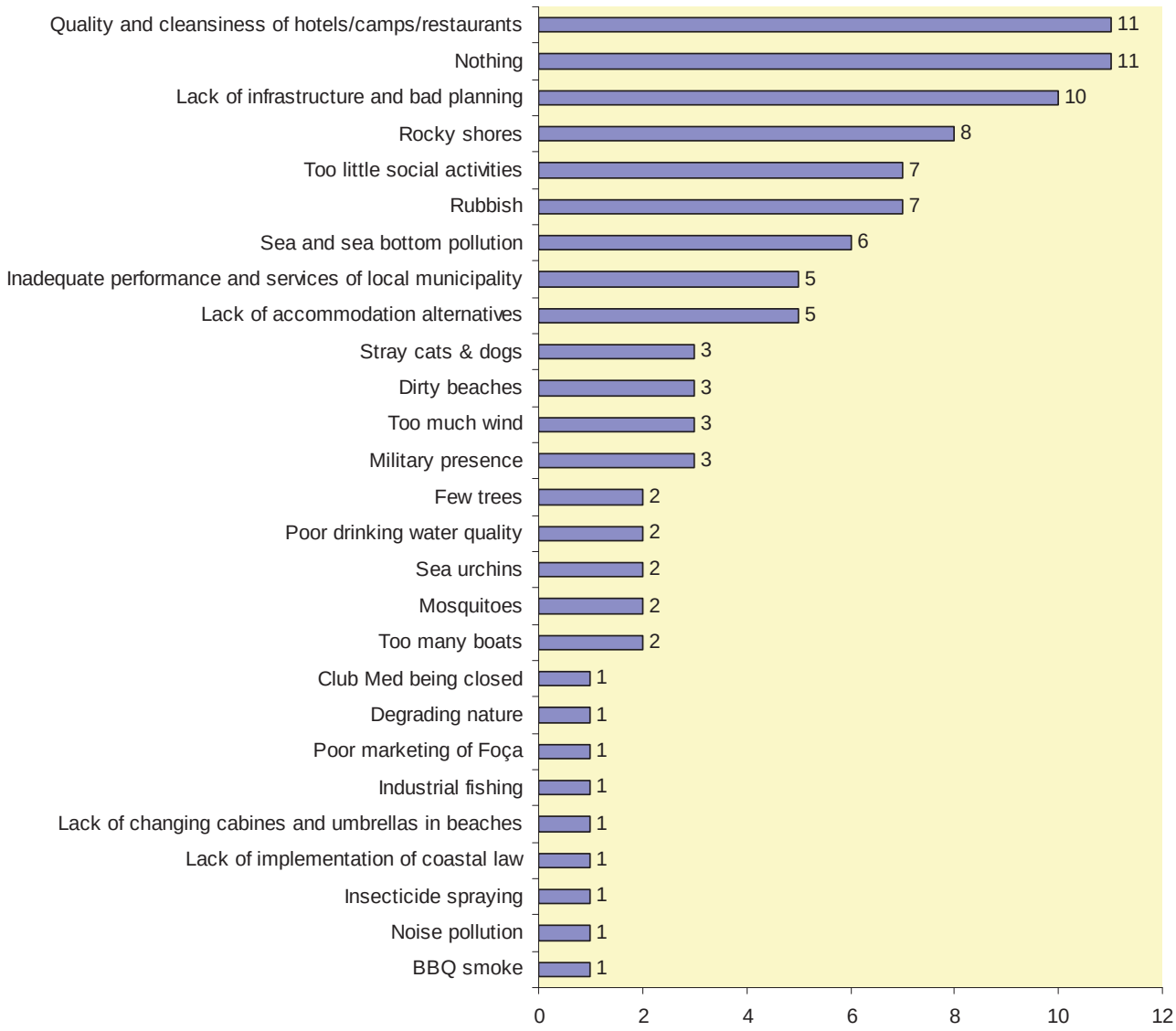


Figure 9. Views reflecting what the visitors do not like in Foça SEPA

Some suggestions were also offered by the respondents about the management of the SEPA. These include, in the range of frequency they were mentioned, improvements and standard setting in terms of quality and hygiene of the tourism facilities such as restaurants, camps and hotels; creating and implementing new social activities (for instance, a Monk Seal Festival) and thereby extending the tourism season in Foça; improving planning and infrastructure (such as parking lots, roads, landscaping); improving beach maintenance and cleaning including toilet and shower facilities; avoiding interventions affecting the historical architecture of the town, among others (see Figure 5 below). In addition, twelve respondents saw no need for management improvements and seven respondents underlined the importance of keeping Foça as it is, without making any compromises in terms of its natural heritage.

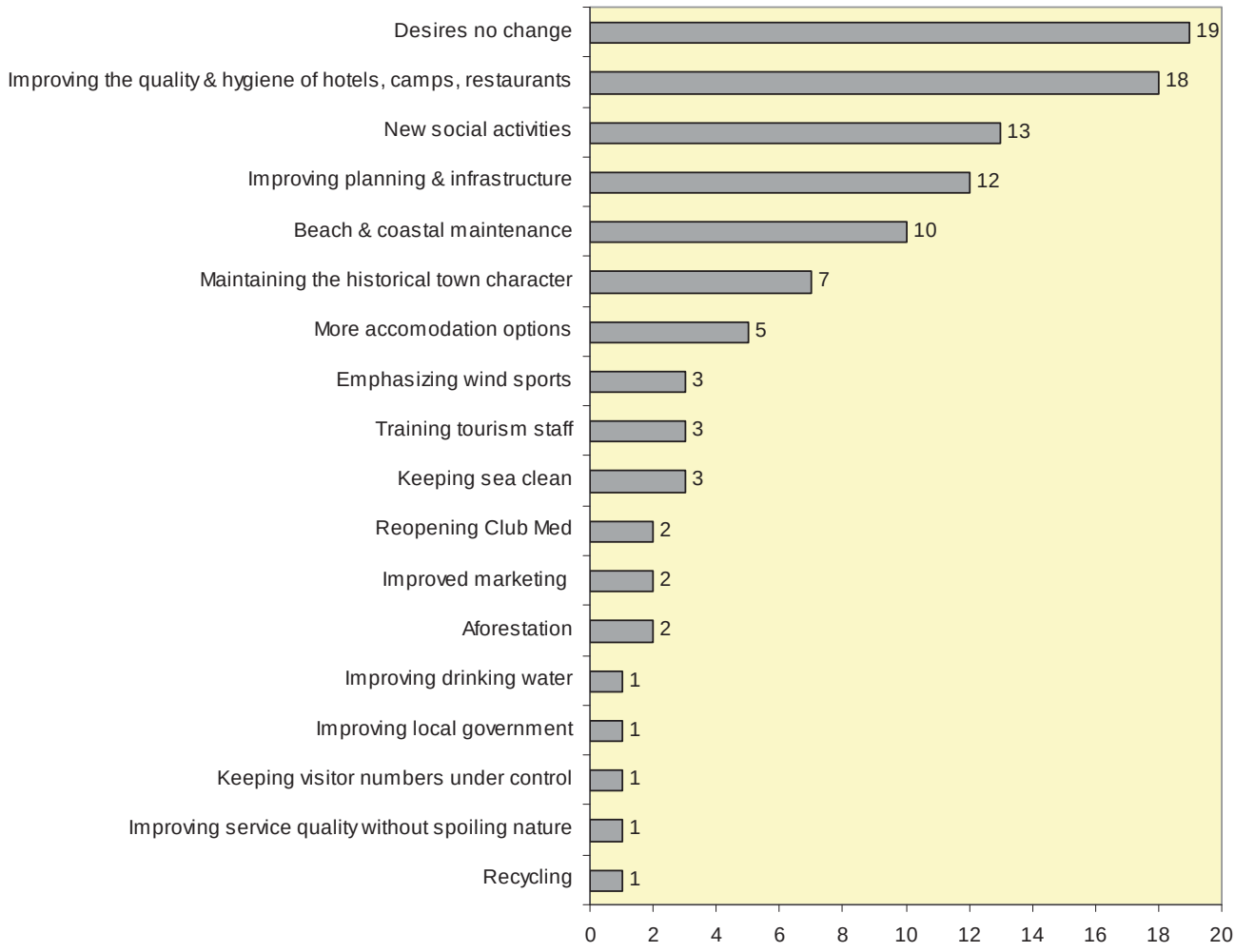


Figure 10. Views and suggestions of the survey respondents on the management of Foça SEPA

4.3.2.2 Valuation

The valuation of tourism in Foça SEPA is based on an estimate of visitor numbers and the tourism expenditure derived from the tourism survey. There are three broad types of visitors to the area – local and foreign tourists, day visitors and homeowners who only stay in the area for the summer months.

Local and foreign tourists. Foça District Culture and Tourism Bureau keeps a record of the visitors who visit the local information office and produces estimates of the annual visitor numbers accordingly. Based on their data, between 2004-2010 tourist numbers have fluctuated between 15,000 and 25,000 people (Foça District Culture and Tourism Bureau 2010). In 2010, a total of 17,102 people are recorded to have visited the district.

Even though differing types of data are given for the bed capacities of the tourism establishments in Foça (IZKA 2009; Sualtı Araştırmaları Danışmanlık 2008, Aykom 2008), the most recent data provided by the district tourism bureau is used in this assessment. According to the bureau, 14 hotels, 1 motel, 4 holiday villages, 16 bed and breakfasts, 8 apart hotels, 4 boutique hotels and 4 campsites are available in the district with a total bed capacity of 3,323. Of these, 4 establishments are licenced by the MOT (in other words 614 beds). The survey of hotels (see section 4.3.2.5) indicated that 28% of establishments are licensed

by the MOT, with the majority (72%) licenced by the municipality.

Based on the available information, it is assumed that Foça SEPA as a whole receives at least 20,000 visitors per year.

Day visitors[12]. Daily visitors to Foça arrive by private cars and public (road and sea) transport. There are no official statistics of day trips to the SEPA; however, it is possible to estimate visitor numbers based on public bus usage, estimated car numbers and seasonal boat expeditions to Foça.

In recent years, a shift to day visitors has been observed in Foça SEPA (Sualtı Araştırmaları Danışmanlık 2008). The newly established speed train from İzmir towards Selçuk, connected to Foça by a municipality bus service from the highway juncture, may have played a role in this regard. Single day visitors come to Foça throughout the year and especially on weekends from İzmir and Manisa due to the proximity of the SEPA. During the summer months, day visitors use the beaches and campsites within the SEPA while in the winter, they mostly come for enjoying to seaside views and the dining experience at the Küçük Liman restaurants.

There are three public road transportation means to arrive to Foça. S.S. Foça Transportation Cooperative, established in 1985, and Foça Birlik Tourism and Transport company, established in 1992, have regular minibus services from İzmir (every half hour for ten hours a day). They both charge 8 TL/person and transported around 10,000 people each in 2010. The municipality bus (İzmir Büyükşehir Ulaştırma) has been in operation since February 2011 between the main highway juncture and Foça. The minibus r cooperative and company raised concerns about having lost customers to the new municipal bus service (who have granted reductions or free rides to state employees, soldiers, senior citizens etc.) It is assumed that another 10,000 people are transported annually via this new bus service.

The daily visitors to Foça also come from the nearby Lesbos island as well as the opposite coast of İzmir peninsula. Since 2007, one private company, TURYOL, offers round-trip journeys between Foça and the Greek island on a daily basis between May and October. Their boat capacity is 300 people. There are two types of customers coming from Lesbos: locals who get their provisions from Foça (especially on Tuesday, the local market day) and regular tourists who come for 2-3 day visits. The ring boats between Foça-Karaburun-Mordoğan operate 5 days of the week between May and September carrying about 100-150 people (this ring services is twice a day).

Car park information is not available for Foça; however, estimations have been gathered through personal communication with District Culture and Tourism Bureau. During the high season (2.5 months), roughly 1,000 people (or about 250-300 cars of 3-4 people) come to Foça center during the weekend days (or 2,000 people/weekend) and this number drops by half for the rest of the year (38 weeks).

Based on Table 10, day visitors are estimated at 139,750. Note that this is an underestimation due to the fact that only weekends have been considered for day visitors arriving in their private vehicles.

House owners visiting the area in summer. Summerhouse owners are concentrated at Foça center's Büyük Deniz Bay (Türkyılmaz *et al* 2003). There are no estimates of the number of summerhouses out of the overall residences in Foça.

The survey results revealed that overall visitors spend 19 days on average in Foça. The average length of stay for Turks is 22 days (including day visitors) while the average length of stay for foreigners is 12 days (there are no foreign day trippers in the sample) (see Figure 11). According to the hotel survey, visitors stay an average of 6 days during the high season and an average of 3 days during the low season. Other studies report shorter average stay lengths: 2 to 7 days according to IZKA (2009) and 2 days according to Aykom (2008). The reason why the tourism survey reports a significantly higher average length of stay is due to the high number of people in the sample who stay in Foça over the summer by either renting a house/flat or by staying in the camping sites and bungalows within the

[12] This section is based on field interviews in March & June 2011.

Table 10. Estimations on the number of day visitors to Foça SEPA per annum

Means of Transport	Detail	Peak Season*	Rest of the year	Total
By Boat	From Lesbos	22,500**	18,000***	40,500
	From Karaburun-Mordoğan	7,500¤	3,750¤¤	11,250
By Car	-	20,000~	38,000~~	58,000
By public transport	Transport cooperative, private company and municipality bus			30,000#
TOTAL				139,750

* Peak season counted as 2.5 months
** Assumes full boat capacity of 300 people
*** Assumes half boat capacity of 150 people for TURYOL's four other active months
¤ Assumes full capacity of 150 people * 5 days per week for the high season
¤¤ Assumes half capacity of 75 people * 5 days per week for remaining active season of 2,5 months
~ Assumes 2,000 visitors/weekend
~~ Assumes 1,000 visitors/weekend for 38 other weekends of the year
Based on Foça transport cooperative and company + assumption of similar annual amount through the municipal bus service.

confines of the SEPA. There are 31 Turks staying more than 15 days in the SEPA (8 people staying one to two months; 10 people staying 3 months; 3 people staying 4 months and 5 people staying more than 4 but less than 6 months). These visitors are included in the assessment due to the fact that they reflect valid tourism income for Foça including long term rents for accommodation over the summer months.

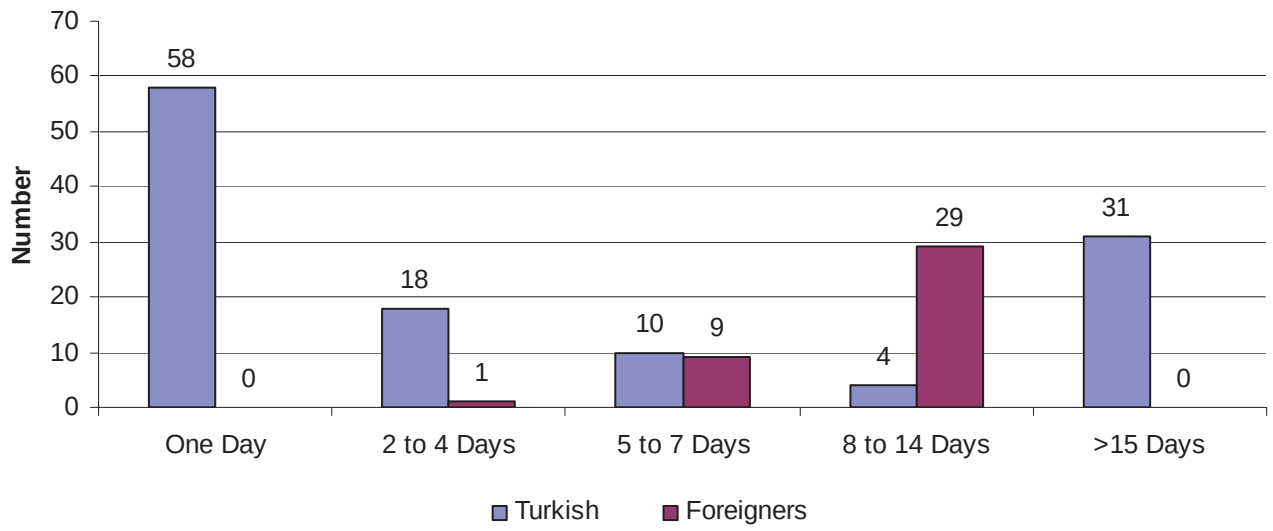


Figure 11. Length of stay for Turkish and foreign visitors in Foça SEPA

Valuation based on tourism survey

Survey results reveal an average daily expenditure of 117 TL/person (with a median of 68 TL and range between 2 TL and 1,157 TL). The wide range in expenditure is explained by the inclusion of both package tours and day trippers in the analysis who have different expenditure patterns.

Based on the average expenditure figures reported in Table 11, foreigners spend four times as much as Turkish overnight visitors. However, interestingly, the average expenses of Turkish day trippers and overnight visitors is in the same range with those of the former slightly higher than the latter. This can be explained by the extended stays of the Turkish overnight visitors (31 out of 121 Turks surveyed) who opt to minimize their accommodation costs through reasonable options such camping grounds and rented houses.

Tourism in Foça SEPA is estimated at 52,075,200TL (US$32,468,887). This is based on 20,000 overnight visitors per year staying an average of 12 nights for foreigners/22 nights for Turks and 139,750 day visitors per year and average expenditure data derived from the tourism survey as documented in Table 13. If a more conservative estimate of an average of 5 nights stay is adopted, tourism in Foça SEPA is estimated at 24,305,000TL per year (US$15,154,167).

Table 11. Daily Visitor Expenditures

Category	No.	% of overall sample	Average	Min	Max	Median	No / year	Value / year[1] based on 12 nights (F) & 22 nights (T)	Value / year based on 5 nights overall
Foreigners	39	24.4%	271	51	1,157	217			
Turkish	121	75.6%	67	2	333	44			
Day trippers – Foreigners	0	0%[3]	NA	NA	NA	NA	0	0	0
Day Trippers – Turkish	58	100%[3]	72	5	300	50	139750	10,062,000	10,062,000
Overnight visitors – Foreigners	4	4%[4]	474	116	1,157	311	800	4,550,400	1,896,000
Overnight visitors – Turkish	62	61%[4]	62	2	333	35	12200	16,640,800	3,782,000
Tour visitors – Foreigners	35	34%[4]	248	51	686	217	6800	20,236,800	8,432,000
Tour visitors – Turkish	1	1%[4]	133	133	133	133	200	585,200	133,000
Overall	160		117	2	1,157	68		52,075,200	24,305,000

Notes: 1/ Equal to number of visitors per year * average expenditure per day; for overnight visitors this is multiplied by 19 to reflect the average number of days spent in Foça
2/ Based on survey results 100% of day trippers are Turkish. The total number of day visitors is estimated to be 139,750 per year.
3/ As a percentage of the total number of day trippers (58)
4/ As a percentage of total number of overnight stays (102)
5/ Based on survey results of percentage of overnight visitors (foreigners, Turkish and tour, non-tour) and estimated total number of overnight visitors of 20,000.

Looking at the sample as a whole, transportation is the highest category of expenditure (41%) followed by food (21%) and accommodation (20%) while souvenirs and on site excursions were 9% of costs respectively – Figure 12. This analysis does not include visitors on package tours and international transportation costs have only been included when Foça was the is only place visited for the foreign tourists.

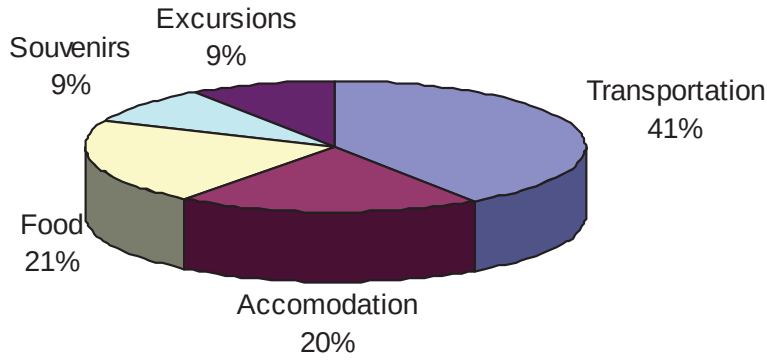


Figure 12. Distribution of visitors' expenditures in Foça SEPA (av. per person)

The distribution of expenditure for the foreign visitors is shown in Figure 13.

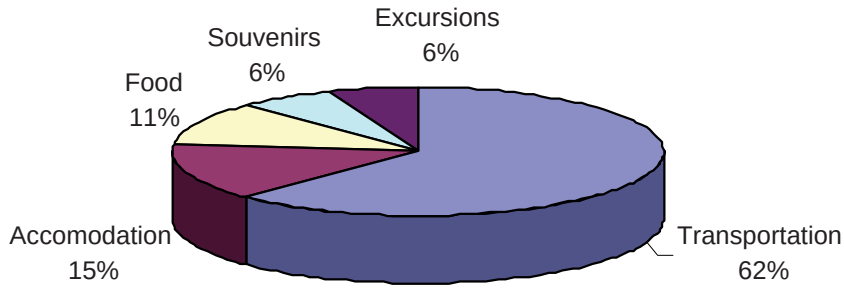


Figure 13. Distribution of foreign visitors' expenditures in Foça SEPA (av. per person)

4.3.2.3. Tour operators

Of the 17 tour operators surveyed, 13 offer boat excursions (1 of them offering North Aegean Blue Voyage trips and two of them also catering to amateur fishing fans during the fishing season), 4 others offer a combination of windsurfing and sailing activities. On average, tour operators remain open 5 and a half months of the year.

Daily boat excursions range from 30 – 50 TL per person, averaging 33 TL. The price of the trips for the cooperative member boats is fixed by the cooperative at 30TL. The monthly average number of customers per boat operator is about 260 people ranging from 33 – 600 (the number depends on the individual boat capacities). Based on the average number of customers and prices one company earns around 47,190 TL per year[13]. For all 29 boat tours that are members of the cooperative and 3 others that are outside of the cooperative, this equals 1,510,080 TL a year.

Based on the surveys, about 8 customers per month undertake Blue Voyage trips (the boat capacity is 8 person[14]). The cost of renting the boat is 1,000TL per day and a maximum of 3 tours per season lasting on average 4 days is typical (personal communication, S. Değirmencioğlu from Nostalji company 2011). The revenues from Blue Voyage excursions implies an additional 12,000 TL a year for the SEPA.

[13] 33TL per trip * 1,430 customers per year (260 customers for 5.5 months)

[14] Nostalji Boat Company is the only operator in Foça offering Blue Voyage tours - http://www.nostaljifoca.com

Furthermore, wind-based activities also generate income in Foça SEPA. The rental of windsurfs and sail boats (and in some places also of small catamarans and hobby cats) ranges between 15-35 TL per person an hour (the average is 25 TL/hr). Based on survey results, customers range between 10-1,000 people per month per establishment (depending on the size of the holiday village or hotel) averaging about 280 people. The season for wind-based activities, based on survey results, is around 6 months. Assuming that a customer will rent a windsurf or sail boat for 4 hours a day, this would amount to a daily per person expenditure of 100TL. Considering that four main establishments offer windsurf and sailing in Foça SEPA (Club Phokai Nielson, Hanedan, Leon and the Foça sailing club – see section 4.3.3), this amounts to an annual total of 672,000 TL in the MCPA.[15]

Four full-time staff are employed on average in each enterprise and some of them employ additional part-time or seasonal staff members (7 out of 17 establishments surveyed employ part-time staff). One of the bigger tour operators (which is also a hotel) employs 40 full time staff and three times as many part time staff.

All of the surveyed tour operators were aware of Foça's protection status as a MCPA. This was primarily due to the monk seals (5 respondents), through the grapevine (4 respondents), signboards and cooperative union (1), through fishing activities (1), due to diving prohibitions (1), previous work in local municipality (1), coast guard (1).

Tools used to market the tour operator's services include information panels, stands and signboards (11 respondents), internet (10 respondents), brochures and hand-outs (9 respondents), word of mouth/customer satisfaction (6 respondents), and through agents or foreign tour operators (3 respondents).

Customer feedback to tour operators includes:

- Customers are generally satisfied with their tour / activities (12 respondents)
- They are attracted to the site due to its well-preserved and untouched natural qualities including the clean sea and air (4 respondents)
- They like the calmness of the area, i.e., no traffic (2 respondents)
- The proximity to İzmir airport is an important plus factor (1 respondent)

Tour operators raised the following concerns and limitations with regards management of Foça SEPA:

- Discontentment with the local government (ineffective, unproductive, no planning and maintenance problems) – 9 respondents
- Insufficient tourism developments or investments (especially in shoreline/coastal infrastructure, lack of tourism marketing, lack of services) – 6 respondents
- Maintenance and pollution problems – 2 respondents
- Restrictions on construction in the SEPA – 2 respondents
- Unsatisfactory number of foreign tourists (who tend to generate more income locally) – 1 respondent
- Insufficient services for the daily excursion boats – 1 respondent
- Lack of competent staff in tourism management – 1 respondent
- No concerns – 2 respondents

4.3.2.4. Restaurants

The survey covered 26 restaurants located within the protected area, the majority of which are concentrated in Foça center's Küçük Liman bay. The total estimated number of restaurants in Foça is around 40 (Foça District Culture and Tourism Bureau 2010), thus the surveys covered about 65% of these.

Awareness on the site's MCPA status is very high (only 2 restaurant representatives out of 26 were unaware of the site's conservation). This awareness is mainly due to the following factors (with number of times cited in parenthesis): monk seals

[15] 100 TL/day (as a daily average of 4 hours for 25TL/hour) * 280 people/month * 6 moths * 4 establishments

and NGOs (8), through the Municipality and GDNAP (6), through the fishermen (4), through word of mouth (5), through local news (2), through coastal guard (mentioned twice).

More than 88% of the surveyed restaurants remain open throughout the year, 8% are open one third of the year, with the rest open for 7 months.

Less than half of the surveyed restaurants (42%) offer fish in their menu. The most popular species are Gilthead seabream, seabass, red mullet, sole, shrimp, sardines, anchovies and calamari. The majority of Foça restaurants (75%) procure their fish from the local fish market, the rest buy fish directly from the fishermen, or from İzmir wholesales market (especially the aquaculture species) or a combination of these.

Restaurant capacity ranges from 30 to 250 people with an average of 105. The price of a meal on average is 18 TL per person.

On average the surveyed restaurants employ 6 full time staff throughout the year and 5 part time staff especially during the peak season. The distribution of the part time versus full time employees is shown in Figure 14. The average for the former is 1 and the average for the latter is 2 for surveyed restaurants.

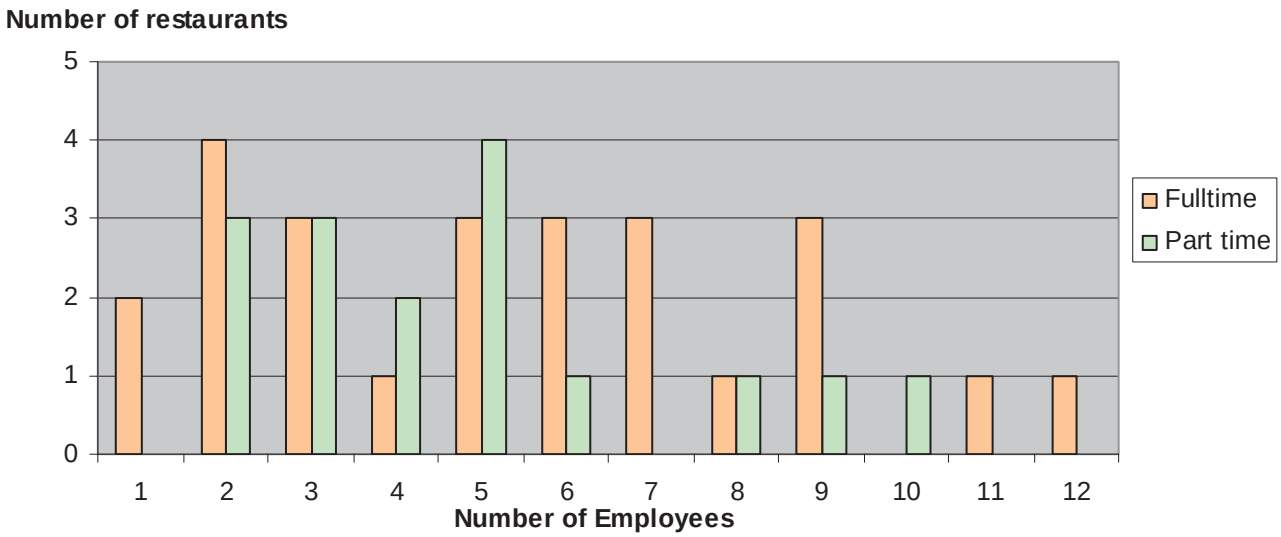


Figure 14. Number of Part and Fulltime Employees in Sampled Restaurants

Table 12 below provides details on the number of months restaurants operate and the number of customers per day and per season (based on a 90 day high season and 270 day off season). The total number of customers estimated across the 26 restaurants for which survey responses were provided is 590,730 per year, or an average of 22,720 per restaurant per year.

Table 12 Customers per year for surveyed restaurants

No	Operational months	Number of Customers in high season (per day)	Total number of customers in high season/year	Number of Customers in low season (per day)	Total number of customers in low season/year
1	12	90	8 100	70	18 900
2	12	70	6 300	30	8 100
3	12	80	7 200	50	13 500
4	12	150	13 500	80	21 600
5	12	100	9 000	50	13 500
6	12	60	5 400	100	27 000
7	12	75	6 750	40	10 800
8	8	45	4 050	15	2 250
9	3	3	270	NA	NA
10	12	100	9 000	40	10 800
11	12	65	5 850	30	8 100
12	12	20	1 800	5	1 350
13	12	135	12 150	70	18 900
14	12	30	2 700	15	4 050
15	12	30	2 700	13	3 510
16	12	80	7 200	20	5 400
17	12	175	15 750	75	20 250
18	12	500	45 000	100	27 000
19	3,5	300	27 000	100	1 500
20	12	20	1 800	5	1 350
21	12	400	36 000	100	27 000
22	12	75	6 750	20	5 400
23	12	500	45 000	50	13 500
24	12	50	4 500	30	8 100
25	12	160	14 400	35	9 450
26	12	80	7 200	15	4 050
Total		3393	305 370	1 158	285 360
Average		131	11 745	46	11 414
Total (12 months only)		3045	91 350	1043	281 610

The majority of the restaurants do not have an active marketing strategy and rely mainly on word of mouth and returning customers (mentioned by 15 establishments); others use the internet for their marketing (mentioned by 12 establishments); still others use brochures and hand-outs (mentioned by 8 establishments). Fewer mention outdoor signboards (4), magazine & newspaper advertisement (2), live music (1) and sponsorship (1).

In terms of trends in visitors, 80% of the sampled restaurants (19 establishments) think that visitor numbers have fallen in the past 5 years, 12% (2 establishments) think that visitor numbers have increased and 8% (1 establishment) believe no change has occurred.

Restaurant representatives generally do not hold a very positive picture about the future of their economic activity: nearly half of the sample predict it will get worse due to the local government, the lack of investment in tourism, falling customers, high taxes and increasing financial concerns.

Some (6) nevertheless see their business getting better (if the necessary investment is secured) partly due to the new metro line from İzmir towards the North. An equal amount of restaurants (6) feel uncertain of their future prospects (stating that things depend on accommodation capacity/ construction permissions in Foça).

The following issues regarding the management of Foça SEPA were raised (note that 5 respondents raised "no concerns"):

- Discontent with local government due to mismanagement - i.e., insufficient inspection, transportation, lack of services, lack of experienced local managers (mentioned 12 times)
- Insufficient investment in tourism and development, including infrastructure and marketing (mentioned 5 times)
- Lack of foreign tourists due to insufficient marketing (mentioned 3 times)
- No aesthetic/architectural unity or harmony / lack of care and interest for cultural heritage (mentioned 3 times)
- Limited or old/deteriorating buildings for accommodation because of SIT and SEPA restrictions (mentioned twice)
- Maintenance and pollution problems (mentioned twice)
- Lack of social activities (mentioned once)

4.3.2.5. Hotels

A total of 22 hotels and camp sites were interviewed comprising a range of establishment types (Figure 8). A high percentage - 81%, of the surveyed institutions were aware of the site's protection status. This awareness was mainly due to the local news and press (6 respondents), through the Municipality and GDNAP (4 respondents), the presence of monk seals in Foça (3), through the grapevine (2), due to prohibitions including diving (2) and because of being a local (1).

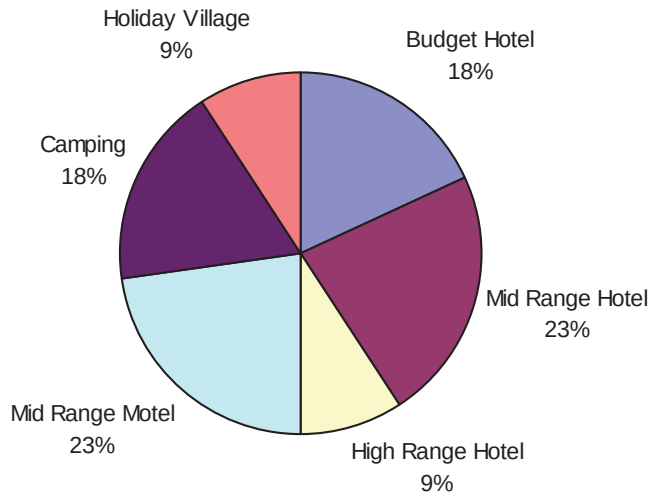


Figure 15. Surveyed accommodation facilities in Foça SEPA

Around 72% of the hotels and campsites had a municipal licence and 28% had a Ministry of Tourism licence. The room capacity (of the hotels and motels) ranges between 5 and 160 with an average of 30 rooms. Bed capacity ranges between 6 and 300 with an average of 66 beds. Table capacity ranges between 0 and 250 with an average of 40.

During the high season, a room costs between 75 - 175 TL/night (averaging 110 TL) while during in the low season the price range drops to 50 - 150 TL/night (averaging 75 TL). Visitors stay between 2-14 days, averaging 6 days, during the high season and between 1-7 days, averaging 3 days, during the low season. Occupancy is good in the high season with 73% of hotels and motels in general at full capacity; however, during the low season occupancy falls to 38% for those that remain open.

Hotels and campsites use the following marketing tools (with the number of times mentioned in parenthesis): Internet and website (19); brochures and hand-outs (7); tour agencies (6); outdoor signboards (4); magazine or newspaper publicity (2); word of mouth i.e., through returning customers and reputation (2).

The number of full time employees ranges between 1 and 40 (the average is 6). The number of part time employees is between 1 and 120 (the average is 34).

In terms of trends in visitor numbers only 18% believe that visitor numbers have increased in the past 5 years, 54% think they have declined (and the season is said to have shortened in the past 15 years) and 27% indicate that it has not changed. One establishment is new thus unable to respond to the question.

About 27% of the facilities offering accommodation in Foça think that their business will get worse in the future (due to the current state of tourism in Turkey as well as the local government), about 23% predict no change and other 23% are more hopeful (due to the new transportation opportunities, highways from İzmir). Around 13,5% foresee minor developments and 13.5% remain uncertain due to developments in the Turkish economy and local governmental situation.

Hotel and camping operators raised the following concerns or views about how Foça SEPA is used and managed (with the number of times mentioned in parenthesis):

- Discontentment with the local government: mismanagement; ineffective and insufficient planning, investment and communication with the locals (10)
- Tourism needs boosting / development and marketing needs improving (8)
- Problems with beach and coastal maintenance and sea pollution (3)
- Unaesthetic/undesired buildings and structures (2)
- Improved access to Foça (metro on the main highway) has dropped the quality of tourists (2)
- Unease due to the military presence (2)
- Content with GDNAP and port management (1)
- Limited construction permissions (1)
- Too many lay cats and dogs (1)
- No concerns (5).

These responses seem to correlate with the results of the socio-economic surveys done by Aykom (2008) in which the main problems in the tourism sector are stated as the insufficient number of tourists (41.9%), followed by unsatisfactory accommodation (22%), inadequate marketing (6.5%), lack of infrastructure (6.5%), the presence of the military locally (6.5%) among some others.

4.3.3. Valuation of Key Activities:

This section provides additional information on the range of activities offered within Foça SEPA derived from existing reports and data and field interviews March 2011.

Daily Boat Tours. Boats make up a significant aspect of marine recreation in Foça, especially in the summer months. According to the local Chamber of Maritime Trade, around 680 boats (not officially registered) and 102 private boats were estimated in Foça in 2008 (Sualtı Araştırmaları Danışmanlık, 2008). One cooperative, named Foça Excursion Boats Cooperative, specializes in daily boating excursions in Foça and consists of 25 commercial boats whose capacities range between 10-100 people. The total capacity of these boats amounts to 700 people. These boats get their license from the municipality; however, they provide their own electricity and water needs. Three other excursion boats that are not members of the cooperative also exist, thus a total of 28 daily excursion boats operate in Foça (ibid).

The total active days for boat excursions is stated to be 45 days a year peaking in July and August (30 days full capacity and 15 days at 50% capacity). Most of the daily boat excursions leave the harbor at 11.00 and return at 17:00, and cost 30TL per person. The boats typically anchor at bays suitable for swimming and provide a fixed lunch menu. The following sea route is typically followed: Orak Island, Kosova Beach (where lunch is offered), old Club Med Beach, the opposite side of

Orak Island, Fener and the spot known as "Yeşil Tepe" (personal communication with Foça Excursion Boats Cooperative head 2011).

Figure 16. The stops of a typical daily excursion in Foça (source: Nostalji Boats)

At weekends in particular when daily Turkish visitors come, the bays of the MCPA are congested with tour boats and this also creates noise pollution. The Foça SEPA Carrying Capacity Study found that the number of boats using the Foça harbor area exceeds the carrying capacity, determined at 373 per day. The amount of waste water leakage to Foça harbor area from the boats is estimated at 21m^3 (Sualtı Araştırmaları Danışmanlık, 2008). Furthermore, the daily excursions boats damage the benthic habitats and especially the *Posidonia oceanica* seagrass meadows when anchoring during the intensive summer season. Buoys and mooring sites urgently need to be established to prevent further damage from boats anchoring.

Blue Voyage. Blue Voyage consists of renting a larger boat known as *gulet* in Turkish and anchoring at a variety of bays for a period of 5-7 days. In Foça, Blue Voyage which is very popular in Southern Aegean has an alternative name - "Green Voyage" in order to make a distinction. These voyages are between Foça and Dikili /Bademli or Asos in the North. There is only one company offering this type of outgoing sea journeys in Foça with 2-3 boat fleet (personal communication; Işıl Kavitaş 2011).

- **Wind related sports.** The presence of a consistent cross shore wind from the North/North West known as *meltem* throughout the day in Foça and its bays protected by surrounding islands makes it an attractive and safe spot for people who are keen on sailing and windsurfing. Often, tourism operators in Foça compare the town's wind capacity to Alaçatı in the İzmir peninsula, a world renowned spot for windsurfers (personal communication; Bünyamin Güler 2011). An important part of the tourism attractions in Foça is focused around these wind-dependent activities. Several specialized institutions are active offering these services:

• **Foça Sailing Club**. This local sailing club located in Büyükdeniz was established in 1989 and currently has 100 members who pay an annual membership fee of 100TL/person. The income of the Club comes from membership and joining fees. During the summer months, the club offers sailing courses that are reasonably priced (a three week course is about 300TL per person). Most people having joined the Club come from İzmir. The main objective of the Foça Sailing Club is to build the capacity of sportsmen and women in sailing and not profit making. The person in charge of the Club is the second trainer of the Turkish national sailing team.

• **Neilson Club Phokaia**. This hotel opened in a 1998 and operates half the year through package tours promoted in the UK through the Neilson network, a sub-branch of the TUI travel agency, which specializes in water sports. The club's beach has a Blue Flag status (there are five Blue Flag beaches in Foça) and the hotel upholds high environmental standards ("white star" for its sun energy use and wastewater treatment). A range of water sport activities are offered including: catamarans, hobby cats, windsurfing, kayaking and sailing. The Neilson Club has 300 surf and

sails in total. With 161 rooms and a 400 bed capacity this hotel remains one of the bigger tourism operators in Foça. In 2010, the hotel's occupancy was of 85% demonstrating a strong interest in the water sports. They employ 125-170 people and 75% of the employees consist of Foça locals.

- **Hanedan Hotel**. This is a family run hotel and apartment-hotel in operation since 1989. The hotel, which has a 150 bed capacity, is open throughout the year while the apartments are open from June to August. The peak season for Hanedan is 85 days; in June, it is 50% full; July 100%; and in August 40-45%. Weekends throughout the rest of the year have an occupancy rate of about 10%. During the peak season 110 people are employed (all local staff) while in the winter 25 people are employed. The clientele of the hotel is 50% Turks and 50% foreigners (especially Norwegians, British, Dutch and French). Among other activities such as beach volley and basketball, Hanedan Beach Club also offers sailing and windsurfing.
- **Leon Hotel.** The establishment is open six months of the year. For two months they offer package tours through an Italian firm specializing in cultural tourism and the rest of the season, they organize children's camps and other group deals. Windsurfing has been an optional activity since 2010; twenty windsurfs are available, for which the demand is good.

Cultural & Archeological Heritage

Foça offers cultural and archeological assets that are currently underutilized in terms of value-added tourism. The focus groups carried during the Aykom study (2008) underlined the opportunities that an archeological museum could create in the district by highlighting the importance of the town's cultural wealth.

Table 13 summarizes the value of sea related recreational activities on offer at Foça SEPA. These estimates are based on a number of assumptions and are gross rather than net estimates, that is costs have not been deducted.

Table 13. Marine related recreational activities valuation

Activity	Value /year TL	Comment
Estimated revenue for daily boat tour companies operating in Foça based on tourism survey (see Section 4.3.2.3)	1,510,080	Gross. Based on the average number of customers and prices one company earns around 47,190 TL per year[16]. For all 29 boat tours that are members of the cooperative and 3 others that are outside of the cooperative, this equals 1,510,080 TL a year.
Windsurf & Sailing	672,000	Gross. Based on the average number of customers (280 people/month) and hourly rental fees of average 25TL/person during a 6 months active period for 4 establishments.
Blue Voyage Tours	12,000	Gross. Based on survey results and personal communication with the only company (Nostalji) offering tours out of Foça SEPA in the Northern Aegean. A total of maximum 3 trips of 4 days with a daily boat rental coast of 1,000 TL.
TOTAL	2,194,000	

Since the summer of 2011, GDNAP has been implementing an annual occupation fee from the coastal zones of the SEPA used by private companies, a fee previously levied by the Ministry of Finance. The fees collected by the Foça GDNAP office for 2011 are presented in Table 14.

[16] 33TL per trip * 1,430 customers per year (260 customers for 5.5 months)

Table 14. Usage fees levied by GDNAP in Foça SEPA (2011)

Name of Establishment	Place/Bay	m^2 / day price	Total m^2	Total days used	Fee processed in Sept 2011 (TL/2011)	Fee intended to be processed (TL/2011)
Acar Camping	Kartdere	0,022	6457	105		14 916
Kosova Camping	Kosova	0,022	6089,83	105		14 068
Club Mackerel	Küçük Ayaini	0,032	1453	109	5 068	5 068
Hanedan	4. Mersinaki	0,041	10000	105	14 000	29 274**
People Camping	Mersinaki	0,022	2540	105		5 867
Teras Hotel	3. Mersinaki	0,038	150	90	513	513
Rota Café*	3. Mersinaki	-	-	-	-	-
Remzi's Place*	3. Mersinaki	-	-	-	-	-
Ferah Camping*	3. Mersinaki	-	-	-	-	-
Neilson Phokaia	2. Mersinaki	0,051	5497	183	34 886	51 304**
Club Şamata	1. Mersinaki	0,04	1527,5	105	3 000	6416
Melis Café	1. Mersinaki	0,04	200	92	736	736
Leon Hotel	1. Mersinaki	0,044	668	105		3086
Sunset Hotel	1. Mersinaki	0,044	135	105		624
Vertigo Café	Büyükdeniz/Koltuk beach	0,055	265	105	1 041	1 530**
Municipality Social grounds	Karakum Beach	?	?	?		?
Kale Camping	Kale Point	?	?	?		?
Yeşil Kiosk	Küçükdeniz	0.062	150	365	2 310	3 395**
Havana Beach*	1. Mersinaki	-	-	-	-	-
TOTAL					61 554	136 795

* These establishments were not paying usage fees to the Ministry of Finance previously. Following GDNAP's initiatives, fees will be levied starting in 2012.
** Fee has been discounted for these establishments based on GDNAP contractual agreement clauses.

The total estimated coastal use revenues for GDNAP for 2011 is 136,795 TL.

4.4. Summary of the Valuation

Table 15 below summarizes the monetary values derived for Foça SEPA ecosystem services. The total annual value is estimated to be US$37,066,203 per year. Section 6 of the report discusses in detail the findings based on this summary.

Table 15. Foça SEPA, Summary of valuation results

Service	Value/ year US$	Valuation approach	Comment
Fish	6,207,254	Market prices	The sustainability of fishery has not been considered and estimate does not include recreational fishing. Probably an underestimate due to under reporting of fish catch
Carbon sequestration	408,218	Market prices (avoided cost approach)	Assumes development of market in blue carbon credits analogous to the forest carbon market. This value is therefore not currently 'captured'. Based on market price of carbon of US$11.2.
Erosion protection	5,263,731	Benefits Transfer	Mangos *et al* (2010). Based on 160,000 Euro per meter of coastline, 45.2 km of *Posidonia* beds in Foça SEPA and 52% of the area at risk.
Waste treatment	882,000	Benefits transfer	Based on Mangos *et al* (2010) estimate for Turkey of 229 million Euros apportioned to the study site based on length of its coastline (23km).
Tourism / Recreation	24,305,000	Market prices	Based on conservative estimate of tourist numbers (20,000 overnight visitors and 139,750 day visitors per year) and a survey of tourist expenditure. Individual recreational activities are considered to be captured in this estimate.
TOTAL	37,066,203		

OPPORTUNITIES TO INCREASE REVENUE FLOWS FROM FOÇA SEPA

9

5.1. Background

This section draws on the economic analysis undertaken to identify new potential income generating activities that can increase revenue flows to Foça SEPA.

A key component of the GEF-UNDP project, under which this economic assessment has been undertaken, is to identify new and innovative financing arrangements for the site. Underpinning the identification of appropriate financing mechanism is a clear scientific understanding of the services being provided by the marine ecosystem, a quantification of this service (in biophysical terms), and an understanding of its economic value and of the beneficiaries. Potential services provided at the Foça include (in addition to fish) carbon sequestration, disturbance regulation, waste assimilation and tourism benefits.

It should be noted that other components of the GEF-UNDP project are focused on the identification of feasible income generating options for the site, the determination of cost-offsetting mechanism and the development of a business plan for Foça. Therefore this section only provides an overview of the opportunities for financing falling out of the economic analysis and a high level discussion of potential new and innovative financing mechanisms. Many of these mechanisms such as carbon credits for blue carbon and PES type arrangements are only considered to be viable in the long term due to the fact that markets in these services are still developing globally and/ or institutional arrangement in Turkey do not yet permit their use.

A typology of potential financing mechanism is provided in Table 16. This categorizes potential mechanisms into external flows, mechanism for generating funding such as taxes, and market based charges. At present the site is financed through budget allocations from the Turkish government, donor support for specific projects and revenue from tourism. In addition, revenue from fishing is important to local communities in the area.

Table 16. Typology of potential financing mechanisms

External flows	Generating funding	Market based charges
Domestic government / donor assistance Private voluntary donations Environmental funds & debt for nature swaps	Licensing and royalty fees Fiscal instruments Benefit & revenue sharing Cost sharing Investment, credit & enterprise funds	Tourism charges Resource-use fees Payments for Ecosystem services (PES) Mitigation banking and biodiversity offsets Blue Carbon Markets

Source: Adapted from Emerton *et al* 2006

Markets in marine ecosystem services are beginning to emerge around the world. Formal markets now exist to regulate commercial fisheries and potential markets are being proposed for marine biodiversity offsets and carbon sequestration. In addition focused business deals and payments for ecosystem services (PES) are being forged to invest in restoration and conservation of specific marine ecological systems and the services that they provide (Forest Trends and the Katoomba Group. 2010). The sections below discuss some of these potential financing options and their applicability to the Foça SEPA. The focus is on opportunities for capturing blue carbon, Biodiversity offsets and PES, as innovative approaches that may present in time new and innovative financing for the site.

5.2. Finance mechanisms

5.2.1. Fiscal instruments

Taxes on summerhouse owners may be an option in some areas.

5.3. Market-based charges

5.3.1. Tourism charges

5.3.2. Marine Carbon Markets

Due to the fact that they store large amounts of carbon and are threaten by conversion and pollution, seas grasses could be a viable target for carbon finance. This would require data on carbon sequestration rates, on site storage, emission profiles and the cost of protection. There are currently no markets for credits generated by 'blue' (marine) carbon activity. A logical venue for considering blue carbon payments would be through the United Nations Framework Convention on Climate Change (UNFCCC) process. Currently, the only blue carbon activity that could potentially be covered under the UNFCCC would be mangrove protection, possibly falling under the auspices of Reduced Emissions from Deforestation and Degradation (REDD+)[17].

Global markets aimed at reducing GHG emissions offer a potentially large economic incentive to avoid the conversion of coastal ecosystems. This idea is analogous to REDD. Incentives to retain rather than emit blue carbon would preserve biodiversity as well as a variety of other ecosystem services at the local and regional scale (Murray *et al*, 2010).

Participation in a market for blue carbon will involve some costs associated with measuring, monitoring and verifying seagrass loss and carbon stocks, establishing a baseline against which emission reductions are measured, and enforcing contracts and monitoring transactions. There are no available estimates of these costs and they tend to be 'upfront' and therefore need to be carefully assessed before parties proceed with protection efforts (Murray *et al*, 2011).

Box 5 details a scheme for mitigating posidonia loss and disturbance at Fethiye-Göcek SEPA, which could be adopted at Foça.

[17] Reducing emission from deforestation and forest degradation (REDD) is a payment scheme designed to compensate landowners for the value of carbon stored in their forest that would otherwise be released into the atmosphere. REDD+ additionally recognises efforts for reforestation and sustainable forestry.

Box 5. Mitigating carbon loss

A scheme to mitigate the impacts of anchoring in the marine environments, especially in Göcek-Dalaman coves, commenced in 2009 with the creation of 50 mooring sites. Each mooring site can reduced/stopped the degradation of at least 30 m^2 of Posidonia meadows, therefore for all 50 mooring sites 1500 m^2 of sea grasses may have been protected (assuming all site are surrounded by the seagrass). This will contribute to a minimum of 124.5 kg Cfixation per annum[18]. GDNAP is willing to increase the number of these sites both in Göcek-Dalaman coves and the other sites where high marine traffic observed.

5.3.3. Payments for Ecosystem Services

Payments for Ecosystem Services (PES) are contractual and voluntary transactions where a 'buyer' agrees to pay a 'seller' conditional on delivery of an ecosystem service, or implementation of a land use or management practice likely to secure that service. Following the successful development of terrestrial PES systems, markets for marine ecosystem services are now being explored and could become an important source of new financial for marine protected areas in the future. For example a PES might create a financial incentive to protect, restore, or sustain a marine ecosystem service such as shoreline protection and the provision of fish nurseries. Establishing PES often takes years, requiring detailed studies to define the service being provided (this is crucial for a credible PES), estimate its value and undertake extensive stakeholder engagement to build trust and commitment.

Currently there are no Payments for Ecosystem Services schemes operating in Turkey. This is due to a number of factors. First, Ecosystem Services are not yet a widely recognized and studied area in Turkey thus the necessary academic/scientific evidence and know-how is lacking to establish PES contracts. Secondly, the Turkish government is yet to mainstream environmental management and sustainability into development decisions (Adaman and Arsel, in press). Thus, models such as PES do not appear as critical environmental priorities.

5.3.4. Biodiversity offsets

Biodiversity markets are a potentially powerful tool for internalising traditionally externalized costs and compensating good practices. For example, if a business has to pay to mitigate its residual impact on marine species, it either has to bear the cost of mitigation or develop elsewhere to avoid this cost. Conversely, if businesses can be financially compensated for protecting or enhancing a rare marine species or habitat there will be an economic incentive to protect habitat.

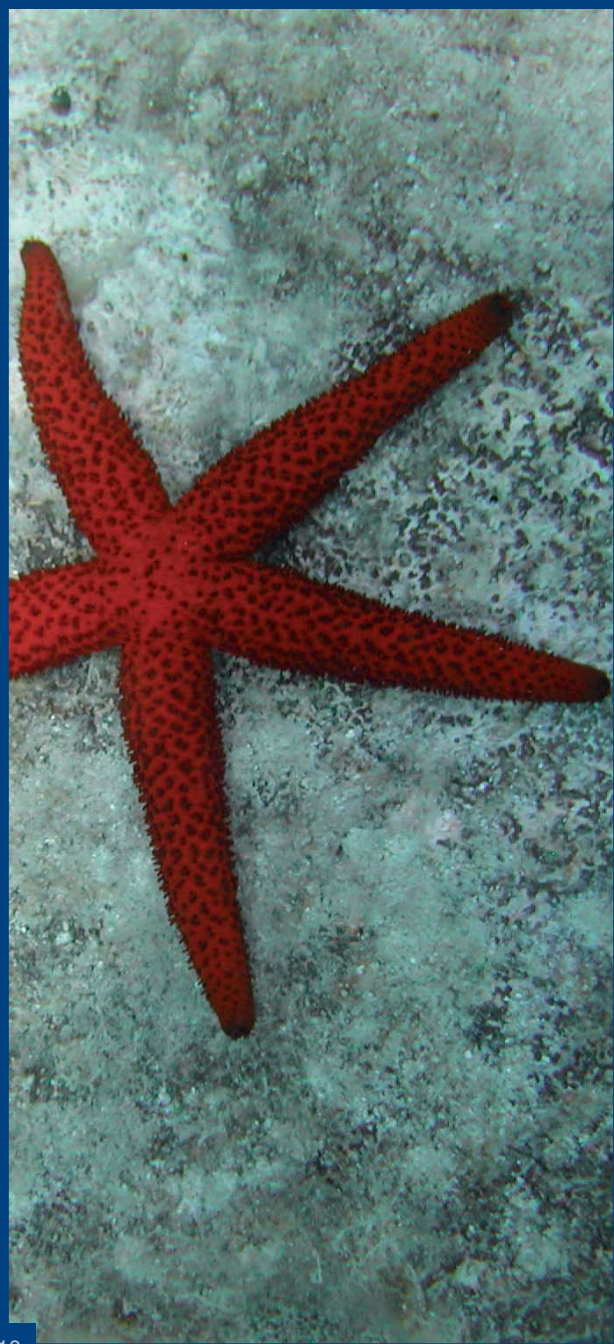
Payment systems for biodiversity compensation include: biodiversity offsets, mitigation banking, conservation banking, habitat credit trading, fish habitat compensation, BioBanking, complementary remediation, conservation certificates. Some are based on compliance with regulation while others are done voluntarily for ethical, competitive, or pre-compliance reasons. They all aim to reduce biodiversity loss and build the cost of biodiversity impacts into economic decisions through markets or market-like instruments and payments (Marsden *et al* 2010).

'Species banking' and biodiversity offsets are mechanisms by which development in one location is exchanged for protection of the same species or community at another comparable habitat. While an offset that attempts to achieve **no net loss** is preferable from an ecological and social standpoint, less comprehensive forms of impact compensation, in which funds are set aside for biodiversity management or valuable biodiversity is protected elsewhere, can be a first step towards better biodiversity footprint management or even eventually a regulated offset system.

Marine biodiversity supports the marine ecosystem services upon which many communities depend. Where regulation for coastal and offshore development is strong, species banking and marine biodiversity offsets could become an important mechanism for marine conservation.

[18] Personal communication, Harun Güçlüsoy.

CONCLUSIONS AND RECOMMENDATION



10

6.1. Conclusions

Foça SEPA has been an MCPA since 1990 due to its diverse marine biodiversity, with the Mediterranean monk seals serving as an indicator of conservation concern, as well as its wide range of terrestrial cultural and natural features. The ecological processes that are taking place within the SEPA support important ecosystem services that contribute to the economic welfare of a range of beneficiaries, support local communities and Turkey's GDP.

This study focuses exclusively on the coastal and marine ecosystem services of the MCPA and estimates the total annual value of Foça SEPA to be around US$37 million per year. This represents an initial valuation of the site, based, in some cases, on a number of assumptions and as a result needs to be refined through more in-depth studies. Shortcomings of the study include the lack of ecological and socio-economic data, as well as time and financial constraints to carry out more detailed valuation methods.

The set of ecosystem services valued in this study includes provisioning services (mainly the fish resources), regulating services (carbon sequestration, erosion protection and waste treatment), and cultural services (tourism and recreation). The economic value pertaining to these services is very likely not to reflect the full value of the MCPA as conservative estimates have been used in determining the ecosystem services individually (ie. for the carbon sequestration of the Posidonia meadows or tourism and recreational uses of the site).

A number of potentially important ecosystem services have been excluded from this analysis. Ecosystems services thought to be present (or potentially present) at the site which cannot be estimated due to a lack of scientific information and/or data are – raw materials such as natural medicines, genetic resources and ornamental resources, which have yet to be studied at the site; the role the marine environment plays in micro-climate regulation, the role of the marine environment in flood and storm protection, the site's heritage value and educational value and the site's landscape and amenity value.

Over 65% of the site's value is attributable to tourism and recreation in the area (see Figure 17) highlighting the importance of sustainably managing the tourism industry in order to secure this revenue flow. This estimate is based on visitor numbers built up from formal sources and information gathered on the site, and expenditure data derived from the tourism survey. It is considered to be an underestimate of the real tourism value in that it is based on market prices (expenditure data) and therefore does not capture the consumer surplus elements of value, a conservative estimate of visitor numbers was also adopted.

The tourism survey clearly demonstrates that visitors' key motivations for coming to the area are related to its natural assets (i.e., the clean seas, the coastal experience, and the peace and quiet due to low impact tourism at the site). It is therefore critical to protect the marine environment on which this tourism revenue depends.

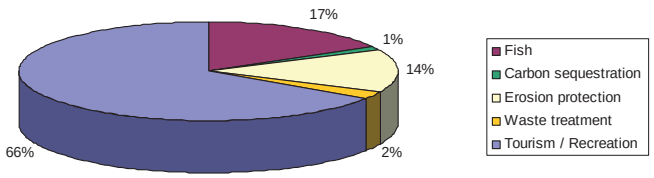


Figure 17. The distribution of the ecosystem service values for Foça SEPA

Following tourism and recreation, fish, estimated at US$ 6.2 million per annum, is the second most significant economic asset. This is likely to be an underestimate not only because this figure does not include recreational fishing carried out in Foça but also due to the general tendency of fishermen to under report their actual catch and earnings. However this estimate is not based on a sustainable harvest level, which is unknown for the site.. Evidence suggests that ineffective fisheries' management and the future of the stocks regionally is threatende by the intensity of illegal fishing activities at the site. The estimate provided may not therefore over estimate a sustainable fish hravest rate.

The valuation results highlight the economic importance of the site's regulating services, in particular the site's posidonia meadows that provide erosion protection and carbon sequestration benefits estimated at 14% and 1% of the total value respectively. Due to the extensive Posidonia meadows across the coastal zones (both of the islands and the mainland), the erosion protection reflects an important environmental service . However, this is based on a value transfer estimate and needs to be refined through on-site assessment of the Posidonia quality and protection function.. The carbon sequestration value could also be refined through site specific studies of the storage and sequestration functions performed by Foça's *posidonia* meadows. Such studies would be timely given the current interest in developing a market in Blue Carbon.

Waste treatment is another ecological benefit provided by the coastal systems of Foça SEPA. However this value is also based on a value transfer approach and needs to be refined through site specific studies. This first requires scientific studies to define the provision of this service at the site. This service could then be estimated based on avoided treatment costs.

The valuation study sheds light on the total economic wealth provided by the marine ecosystems of Foça SEPA many of which (especially regulatory services) do not appear in regular accountings and market transactions.

The site's ecosystem services are also important to local livelihoods and economies. Even though sound statistics about the different occupational revenues are not available for Foça, over 60% of the local population is estimated to earn their living through the services sector including tourism (Yaşar *et al* 2009). There are over 70 small and medium size businesses – restaurants, cafes, hotels engaged in tourism in the SEPA employing roughly around 1,000 people (based on tourism survey estimates and Yaşar *et al* 2009). As the surveys demonstrate, tourism is directly related to the natural characteristics of the site; therefore it is possible to conclude that marine protection is important for the economy. Despite being the leading sector in Foça, previous studies show that tourism alone cannot solve the employment needs and problems in Foça (Gümüş & Özüpekçe 2009).

There are also at least 120 households directly dependent on small scale fishing as their only

income source in the MCPA (based on data provided by the cooperative) and another 30 households who have additional income sources besides fishing. Recent studies however indicate that the livelihoods of the small scale fishing sector is threatened by irregular and relatively low income levels. A key reason for this is considered to be the high level of illegal fishing activity leading to overexploitation of the fisheries. Given the high rate of unemployment in Izmir Province as a whole (10%) these jobs are crucial as alternative job opportunities are limited.

Despite their economic, cultural and economic importance the quality and quantity of Foça's ecosystem services are threatened by a range of pressures including over fishing and illegal fishing activities, tourism pressures and coastal developments.

6.2. Recommendations

The valuation of the ecosystem services in Foça SEPA undertaken in this study leads to the following recommendations that can help both to improved the valuation studies in the future as well as in the sustainable management of the MCPA.

General recommendations

- Parallel to GDNAP's determination to carry out regular biodiversity assessments and socio-economic studies at the different SEPAs of Turkey, valuation studies should be carried out at Foça SEPA with regular intervals in order to observe changes in the value of benefits derived from the range of ecosystem services and the trade-offs that occur between these. Over time, comparative valuation studies can help choose between different management options that will be optimal for the site's sustainability.
- The valuation studies in the future can be refined through the following means:
    - o Improved understanding of the ecological processes that underpin the regulatory services at the site (i.e... site specific studies on Posidonia among others) which would lead to more reliable site specific data on which to base the economic analysis;
    - o Long term studies in order to carry out more detailed valuation methods such as the development of production functions and stated preference studies.
    - o The valuation of the fisheries (both commercial and amateur) should be based on a sustainable harvest rate (quantity) multiplied by net benefits (revenues – costs). Scientific studies of fish stocks are therefore required to determine sustainable harvesting rates;
    - o A multi-disciplinary collaborative team effort in collating ecological and socio-economic data and interpretations;
- Importance of political will & consistency in the conservation efforts of the site in terms of enforcement and monitoring of the site.

Biodiversity conservation

- Marine biodiversity conservation recommendations have been made in great detail for Foça SEPA in the Sualtı Araştırmaları Danışmanlık study (2008). It is nevertheless important to underline that the natural capital that this biodiversity sustains needs tight monitoring and an effective implementation of Foça's Management Plan.

Fishery valuation and management

- Comprehensive (and regular) quantitative analysis of the fish stocks is urgently needed in Foça to sustain the high economic returns coming from the sector. Furthermore, an ecosystem based approach to fisheries management is necessary in Foça SEPA (Ünal 2004; Sualtı Araştırmaları Danışmanlık 2008). This approach to natural resource management at the site can establish proper links between the marine natural capital and the economic activities that are dependent on it.
- Regulations and implementation of deterring factors against illegal hunting need to be tightly applied in the SEPA. For example, both small-scale fishermen and trawlers' landings should be monitored. The local and regional authorities such as MARA are crucial

and GDNAP could be given a stronger role in intervening in non-compliant cases.

- No take zones could be declared along the lines of the regulatory measures that have been taken in Gökova SEPA
- More decentralized fisheries management mechanisms that empower the local fisheries cooperative should be developed
- Quantitative limits on the number of outsider purse-seiners and trawlers that can enter the district's seas should be set and enforced

Developing a sustainable tourism strategy benefiting both people and the marine environment

- Over 60% of the coast in Foça SEPA consists of built-up environment, thus further development for tourism purposes should be regulated. Foça must retain its quaint town characteristics and avoid intensive tourism developments as surveys in Aykom analysis (2008) and tourism surveys for this study confirm.
- Niche tourism activities that can extend the season (i.e., focusing on wind related activities within the SEPA) could be both environmentally friendly (thus compatible with the conservation priorities in the site) but also alleviate the economic hardship facing some tourism operators.
- On the other hand, a number of stakeholders including tourism operators see the MCPA as imposing restrictions (especially on building regulations due to archaeological wealth of the town), so the right incentives need to be developed for these stakeholders to see conservation as an opportunity (i.e., better communication activities are needed locally). The establishment of the recent GDNAP unit locally is a positive development on this regard.
- Lack of the SEPA's promotion and marketing is partially related to the above-mentioned point. Greater promotion of the area's monk seals through a local information centre and the sale of local souvenirs could be considered.
- Diversification of tourism can further rely on more terrestrial activities in the SEPA. While tourism currently lies heavily on the marine and coastal recreation, opportunities exist to divert the intensification towards activities such as hiking, biking, bird watching, archeological features, historic windmills etc.
- Reopening of the Club Med facility should be considered to improve economic livelihoods locally.
- A tourism management plan needs to be developed and enforced to ensure sustainable use of the SEPA.
- Encouragement of bed & breakfast options by households in Foça and promotion of Foça as a boutique holiday destination .

REFERENCES

Adaman, F. & Arsel, M. "Political Economy of the Environment in Turkey", in M. Heper and S. Sayari (eds.), Handbook of Modern Turkey, London: Routledge, forthcoming.

Akçalı, B. and Cirik, Ş. 2007. Alien and invasive seaweeds distribution along the Turkish coast of the Aegean Sea. Rapp. Comm. int. Mer Médit., 38.

Akurgal, E. 1998. Anadolu uygarlıkları. Net Turistik Yayınlar A.Ş., İstanbul.

Aykom Araştırma & Danışmanlık. 2008. Socio-Economic Research of Foça Special Environmemtal Protection Area. Ankara.

Beaumont, N., et al 2007. Identification, definition and quantification of goods and services provided by marine biodiversity: Implications for the ecosystem approach. Marine Pollution Bulletin 54.

Boudouresque, C et al 2006. Presevation et conservation des herbiers a Posidonia oceanic. RaMoGe Publications, Monaco.

CIESM. 2008. Impacts of acidification on biological chemical and physical systems in the Mediterranean and Black Seas. Number 26 in CIESM Workshop Monographs.

Council of Europe. 1979. Convention on the Conservation of European Wildlife and Natural Habitats. Appendix II.

Dauby et al 1995. Particle Fluxes over a Mediterranean Seagrass bed: a one year case study. Marine Ecology Progress Series 126.

Duarte, C. M., and Cebrián, J. 1996. The fate of marine autotrophic production, Limnol. Oceanogr., 41 (8), 1758–1766, doi:10.4319/ lo.1996.41.8.1758.

Duarte, C. M., J. J. Middelburg, and Caraco, N. 2005. Major role of marine vegetation on the oceanic carbon cycle, Biogeosciences, 2, 1–8.

Duarte, C. M., Marbà, N., Gacia, E., Fourqurean, J. W., Beggins, J., Barrón, C. and Apostolaki, E. T. 2010. Seagrass community metabolism: Assessing the carbon sink capacity of seagrass meadows, Global Biogeochem. Cycles, 24, XXXXXX, doi:10.1029/2010GB003793

Döndüren, Ö. 2007. Foça Özel Çevre Koruma Bölgesi Ornithofaunasının ve Bölgeyi Etkileyen Çevresel Faktörlerinin Belirlenmesi. Yayınlanmamış tez. Ege Üniversitesi, Fen Bilimleri Enstitüsü, İzmir.

EEA (European Environment Agency). 2009. Progress towards the European 2010 biodiversity target. European Environment Agency. EEA Report, number 4. Copenhagen, 2009.

EEA (European Environment Agency). 2006. The changing faces of Europe's coastal areas. EEA 6/2006. European Agency for the Environment, Copenhagen, Denmark.

Emerton, L., Bishop, J. and Thomas, L. 2006. Sustainable Financing of Protected Areas: A global review of challenges and options. IUCN, Gland, Switzerland and Cambridge, UK. x + 97pp.

The Encyclopedia of Earth. 2011. Seagrass meadows. Viewed 26 April 2011, http://www.eoearth.org/article/ Seagrass_meadows

Eken, G., Bozdoğan, M., İsfendiyaroğlu, S., Kılıç, D.T., Lise, Y. (eds). 2006. Turkey's Key Biodiversity Areas. Doğa Derneği. Ankara.

EPASA. 2008. Strategic Plan 2008-2013. Ankara.

Foça District Agricultural Directorate. 2010. Agricultural Briefing for 2010.

Foça District Culture and Tourism Bureau. 2010. Tourism Briefing for 2010.

Forest Trends and the Katoomba Group. 2010. Payments for Ecosystem Services: Getting Started in Marine and Coastal Ecosystems. A Primer.

Gambaiani, D., Mayol, P., Isaac, S., Simmonds, M. 2009. Potential Impacts of Climate Change and Greenhouse Gas Emissions on Mediterranean Marine Ecosystems and Cetaceans. Journal of Marine Biological Association of the United Kingdom.

Gacia, E and Duarte, C. 2001. Sediment Retention by a Mediterranean Posidonia oceanica meadow: the balance between Deposition and Resuspension. Estuarine, Coastal and Shelf Science, 52.

Gacia, E., Granata, T. and Duarte, C. 1999. An Approach to Measurement of Particle Flux and Sediment Retention within Seagrass (Posidonia oceanica) meadows. Aquatic Botany, 65: 225-268

GDNAP. 2011. Foça SEPA Summary. Viewed: 20 February 2011, http://www.ozelcevre.gov.tr/icerik-18-Foca.html.

Guala, I., et al. 2006. Posedonia Oceanica 'Banquette' removal: environmental impact and management implications. Biol. Mar. Medit, 13.

Gruber, N. et al 2009. Oceanic sources, sinks and transport of atmospheric $C0_2$. Global Biogeochem Cycles 23.

Gümüş, N. & Özüpekçe, S. 2009. Foça'da turizmin ekonomik, sosyal, kültürel ve çevresel etkilerine yönelik yerel halkın görüşleri. Uluslararası İnsan Bilimleri Dergisi [Bağlantıda]. 6:2. Erişim: http://www.insanbilimleri.com

Huertas, I.E. 2009. Anthropogenic and natural $C0_2$ exchange through the Strait of Gibraltar. Biogeosciences, 6, 6470662

Izmir Governorship. 2010. Districts of Izmir. Viewed 10 February 2011, http://www.izmir.gov.tr/default_B1.aspx?content=302

Izmir Development Agency (IZKA). 2009. Izmir: The Current Situation.

Izmir Governorship. 2011. Official correspondence based on GDNAP data requests.

Jeudy de Grissac, A. 1984. Effects des Herbiers a Posidonia oceanica sur la dynamic marine et la sedimentologie littorale. In International Workshop Posidonia oceanica beds. Boudouresque, C.F. Jeudy de Grissac Aeds) GIS Posidonie publication.

Kaboğlu, G. 2007. Implementation of protection of endangered species and their habitats to the integrated coastal zone management concept: A Case study for the Mediterranean monk seal (Monachus monachus) in Foça – İzmir. Unpublished thesis. Dokuz Eylül University, İzmir: i-xv + 1–244.

Kıraç, C. O. & Güçlüsoy, H. 2008. Foça ve Akdeniz Foku; Foça Özel Çevre Koruma Bölgesi'nde Akdeniz Fokunun (Monachus monachus) Korunması ve İzlenmesi. T.C. Çevre ve Orman Bakanlığı - Özel Çevre Koruma Kurumu Başkanlığı Yayınları. Aralık 2008. Ankara. 48 s.

Laffoley, D., and Grimsditch, 2009. The Management of Natural Coastal Carbon Sinks. IUCN.

Lo Iacono, C., M. A. Mateo, E. Gracia, L. Guasch, R. Carbonell, L. Serrano, O. Serrano, and Daňobeitia, J. 2008. Very high-resolution seismoacoustic imaging of seagrass meadows (Mediterranean Sea): Implications for carbon sink estimates, Geophys. Res. Lett., 35, L18601, doi:10.1029/2008GL034773.

Mangos, A., Bassino, J-P and Sauzade, D. 2010. The Economic Value of Sustainable Benefits Rendered by the Mediterranean Marine Ecosystems. Plan Bleu, UNEP/MAP Regional Activity Center.

Marsden, B, Carroll, N, Moore Brands, K, 2010. State of Biodiversity Markets Report: Offsets and Compensation Programs Worldwide. Ecosystem Market Place.

Martínez, M.L., Intralawan, A., Vázquez, G., Pérez-Maqueo, O., Sutton, P. and Landgrave, P. The coasts of our world: Ecological, economic and social importance. Ecological Economics 63: 254-272.

Mateo, M. A., et al. 1997. Dynamics of millenary organic deposits resulting from the growth of the Mediterranean seagrass Posidonia oceanica, Estuarine , Coastal and Shelf Science, 44, 103-110.

Millennium Ecosystem Assessment. 2005. Ecosystems and Human Well-Being: Wetlands and Water Synthesis. Island Press, Washington, D.C.

Murray, B., Jenkins, A., Sifleet, S., Pendelton, L., and Baldera, A. 2010. Payments for Blue Carbon, Potential for Protecting Threatened Coastal Habitats. Policy Brief. Nicholas Institute for Environmental Policy Solutions, Duke University.

Nellelmann, C., Corcoran, E., Durate, C.M. Valdes, L. De Young, C., Fonseca, L., Grimsditch, G (Rds). 2009. Blue Carbon. A Rapid Response Assessment. United Nations Environment Programme, GRID-Arendal.

Güçlüsoy, H. & Savaş, Y. 2003. Status of the Mediterranean monk seal,Monachus monachus,in the Foça Pilot Monk Seal Conservation Area, Turkey. Zoology in the Middle East 28:5-16.

Güçlüsoy, H. 2008. Damage by monk seals to gear of the artisanal fishery in the Foça Monk Seal Pilot Conservation Area, Turkey. Fish. Res. 90:70-77.

Orr, J.C. et al. 2009. Research Priorities for Ocean Acidification. Report from the Second Symposium on the Ocean in a High-$C0_2$ World. Momaco, October 6-9 2008. Convened by COR, UNESCO-IOA, IAEA and IGBP.

Orth RJ, Carruthers TJB, Dennison WC, Duarte CM, Fourqurean JW, Heck KL. 2006. A global crisis for seagrass ecosystems. Bioscience 56: 987-996.

Pasqualini, V., Pergent-Martini, C., Clabaut, P and Pergent, P. 1998. Mapping of Posidonia oceanica using aerial photographs and side scan sonar; application off the island of Corsica (France). Estuarine, Coastal and Shelf Science, 47.

Pergent, G., Rico-Raimondino, V., and Pergent-Martini, C. 2007. Fate of Primary Production in Posidonia Oceanica Meadows of the Mediterranean. Aquatic Biology 59: 307-321.3

Salm, R.V., Clark, J. and Siirila, E. 2000. Marine and Coastal Protected Areas - A guide for planners and managers. IUCN. Washington DC. xxi + 371 pp.

Sualtı Araştırmaları Danışmanlık. 2008. Determination of the Carrying Capacity at the Foça SEPA Coastal Areas – Final Report. Ankara.

TUIK 2009. Address-based population census.

UNDP. 2010 . Turkey Joins International Combat Against Global Warming. Viewed 14 March 2011. http://www.undp.org.tr/Gozlem2.aspx?WebSayfaNo=866

UNEP. 2006. Marine and coastal ecosystems and human wellbeing: A synthesis report based on the findings of the Millennium Ecosystem Assessment. UNEP. 76pp

Unsworth, R. & Unsworth, L.C. 2010. A Dollar Value on Seagrass. Seagrass-Watch. Issue 41: 2-5.

Ünal, V. 1995. Foça yöresi trol teknelerinin birim av gücü ve ekonomisi üzerine araştırmalar. Yüksek Lisans Tezi. Ege Üniversitesi, Fen Bilimleri Enstitüsü, İzmir.

Ünal, V. 2001. Foça balıkçılığının sosyo-ekonomik analizi ve sürdürülebilirlik açısından değerlendirilmesi üzerine bir araştırma. Doktora Tezi. Ege Üniversitesi, Fen Bilimleri Enstitüsü, İzmir.

Ünal, V. 2004. Viability of trawl fishing fleet in Foça (Aegean Sea), Turkey and some advices to central management authority. Turkish Journal of Fisheries and Aquatic Sciences 4: 93-97.

Ünal, V., Yercan, M., Güçlüsoy, H. and H. Goncuoğlu. 2009. A Better Understanding of Fishery Cooperatives in the Aegean, Turkey. Journal of Animal and Veterinary Advances 8 (7): 1361-1366.

Ünal, V. & Franquesa, R. 2010. A comparative study on socio-economic indicators and viability in small-scale fisheries of six districts along the Turkish coast. Journal of Applied Ochthyology. 26: 26-34.

Türkyılmaz, B.Z., Güney, A., Kaplan, A. 2003. Doğal Alanların Korunması Çalışmalarının İzmir/Foça Örneğinde İrdelenmesi. Ege Üniv. Ziraat Fak. Derg., 2003, 40(3):139-148

Veryeri, O., Güçlüsoy, H. and Y. Savaş. 2001.Snared and drowned – are fishing nets killing off a new generation of monk seals in Turkey's protected areas?The Monachus Guardian 4 (1): May 2001

Yanardağ, A. & Yanardağ, M.Ö. 2009. İzmir'de turizm çeşitleri ve turizm yatırımları ihtiyaç analizi. İzmir Kalkınma Ajansı, İzmir.

Yaşar, S., Sungur, H.U. & Akıncı, Y. 2009. İzmir için Stratejik ve Yükselen Sektörler. İzmir Kalkınma Ajansı Yayın No. İZKA-R/2009-01, İzmir.

APPENDIX 1. LIST OF INTERVIEWS, APRIL 2011

Name	Organisation	Position
Erkan Hamdi Özer	GDNAP	Director
Gürel Açal	TURYOL	Director
Samir Büyükkaya	District Tourism Office	Director
Devrim Oralkan	District Agriculture Office	Fisheries specialist
Işıl Dirim Kavitaş	Ampuria Tourism Company	Owner
Ceyhan Çetin	Foça Fisheries Cooperative	Director
Mert Fırat	Foça Excursion Boats Cooperative	Director
Bilge Durdu	Club Phokaia	Human Resources
Halit & Yusuf Güler	Hanedan Hotel	Owners
Tamer Acar	Acar Camping	Operator
Özer Konaş	-	Fisherman
Dinçer Dinler	-	Trawler
Emrah Taşlı	Foça Sailing Club	Coach
Ozan Veryeri	Underwater Research Association	Researcher
Vahdet Ünal	Ege University	Dr.
-	Foça Transportation Cooperative	
-	Foça Union Tourism Co.	

APPENDIX 2. TOURISM SURVEY INSTRUMENT

Strengthening the System of Marine and Coastal Protected Areas of Turkey

Tourism survey for Foça SEPA

Tourist Survey

Name of interviewer:…….. **Date:**……

A. Background on interviewee

A1: Nationality:……

A2: Is this your first visit? □

If not, how many times have you visited the site?.....

B. Information on visit & expenditure

B1: **[foreigners only]** How many days are you spending in Turkey?.....

B2: Are you on a day trip? □

If not, how many days are you spending in Foça? .....

B3: What is the purpose (motivation for) of your visit?

□ Tourism
□ Business
□ Visiting friends/family
□ Other:…….

B4: Are you travelling:

□ On a package tour
□ Individually

B5: Are you travelling:

□ Alone
□ As a family
□ As a couple
□ Other:…….

B6: *If* travelling as a family – how many people are in your group?.....

Per family: …….

B7: What is the total budget for your visit?

Per person:……
Per couple:……

B8: Can you estimate your expenditures on (as individual/couple/family):

Accommodation (per day):……..
Food (per day):…….
Souvenirs (per trip):……..
Excursions/activities (per trip):……
Travel to Foça (airfares, bus, transfer/taxi, car rental, petrol costs etc.): ……....

C: Views on Management

C1: Do you know that Foça is a (marine) protected area ? □YES □NO

C2: How would you rate the quality of your tourism experience in Foça?

Excellent	Good	Satisfactory	Poor

C3: What do you like about Foça?

C4: What don't you like about Foça?

C5: What improvement would you like to see?

D: Socio-economic information

D1: Gender □ Male □ Female

D2: Age

□ 18-25 □ 26-35 □ 36-45 □ 46-55 □ 56-65 □ 65-above

D3: Occupation:…….

D4: Income per person /per month

Turkish Nationals (TL)

□ 650-1000 □ 1001-1500 □ 1501-2500 □ 2501-3500 □ 3500-above

Foreigners (€)

□ under 1,500 □ 1,501-3,000 □ 3,001-5,000 □ 5,000-6,500 □ Above 6,500

D5: Education

□ N.A. □ Elementary □ High School □ University □ Post Graduate

Name of interviewer:……**Date:**……

E. Survey of Tour Operators (travel agencies) & specialised activities

E1: How many months of the year are you open for? ……..

E2: Type of tour/activity offered and price (per person)

□ Daily Boat excursions: …….
□ Blue Voyage: …….
□ Canoeing/Sea kayaking: …….
□ Paragliding: …….
□ Kitesurfing: …….
□ Banana boat: …….
□ Sailing: …….
□ Bicycling: …….
□ Hiking: …….
□ Rock climbing: …….
□ Other: ……

E3: Price of tour/activity (per person)

E4: Number of customers per month

□ Daily Boat excursions: …….
□ Blue Voyage: …….
□ Canoeing/Sea kayaking: …….
□ Paragliding: …….
□ Kitesurfing: …….
□ Banana boat: …….
□ Sailing: …….
□ Bicycling: …….
□ Hiking: ……
□ Rock climbing: …….
□ Other: ……

E5: How many other tour companies are there offering similar services in Foça?

E6: How many people work in your organization (note how many months a year part time staff work)?

Full time staff: Part time staff:

E7: What feedback do you get from your customers about Foça?

E8: Do you have any concerns about how Foça is used and managed?

E9: Do you know that Foça is a (marine) protected area? □YES □NO

E10: How do you market your services?

Name of interviewer:…….. **Date:**……

F Lodges/Hotels/Campsite Owners

F1: Type of establishment

□ Budget Hotel
□ Mid Range Hotel
□ High Range Hotel
□ Apart Hotel
□ Holiday Village (package style)
□ Budget Motel
□ Mid Range Motel
□ High Range Motel
□ Campsite

F2: Is the establishment licensed by

□ Municipality □ Ministry

F3: Capacity (number of rooms and beds; tables)

Rooms: Beds: Tables:

F4: Room prices (can provide range):

High season: Low season:

F5: Average number of days spent per tourist (range)

F6: How many people work in your organization (note how many months a year part time staff work)?

Full time staff: Part time staff:

F7: Hotel occupancy (%):

High season: Low season:

F8: Have visitor numbers increased or decreased over past 5 years?

□ Increased □ Decreased □ No change

F9: How do you rate the prospects for your business over the next 10 years?

F10: Do you know that Foça is a (marine) protected area? □YES □NO

F11: How do you market your establishment?

F12: Do you have any concerns about how the Foça is used and managed?

Name of interviewer:…….. **Date:**……

G Restaurants

G1: How many months of the year are you open for?

G2: Do you sell fish? □YES □NO

G3: If Yes,

G4a: Who do you buy your fish from?

G4b: What are the most popular species?

G4: Capacity:

G5: Average price of a meal

G6: Number of covers

High season: Low season:

G7: How many people work in your organization (note how many months a year part time staff work)?

Full time staff: Part time staff:

G8: Have visitor numbers increased or decreased over past 5 years?

□ Increased □ Decreased □ No change

G9: How do you rate the prospects for your business over the next 10 years?

G10: Do you know that Foça is a (marine) protected area? □YES □NO

G11: How do you market your restaurant?

G12: Do you have any concerns about how the Foça is used and managed?

UNDER 5 HEADINGS

"Strengthening the System of Marine and Coastal Protected Areas of Turkey"

1 Project Rationale and Project Aim

Some 3,000 plant and animal species have been identified along Turkey's 8,500 km coastline. But Turkey's marine biodiversity is under serious pressure by human kind. The major threats facing Turkey's marine areas are the degradation of marine habitats and ecosystems, the overharvesting of marine resources and the conversion and/or destruction of coastal habitats. This Project aims to facilitate the expansion of the national system of marine and coastal protected areas and to improve its management effectiveness. The Project officially commenced in May 2009, and will end in October 2013.

2 Project Sites

The Project is being implemented at six sites in Turkey. The Project covers five SEPAs and one Nature Park. The project areas are:

- Foça SEPA
- Gökova SEPA
- Datça-Bozburun SEPA
- Köyceğiz-Dalyan SEPA
- Fethiye-Göcek SEPA
- Ayvalık Islands Nature Park

3 Project Outcomes

The Project will have achieved the following three outcomes:

- Responsible institutions have the capacities and internal structure needed for prioritizing the establishment of new Marine and Coastal Protected Areas (MCPAs) and for more effectively managing existing MCPAs
- MCPA financial planning and management systems are facilitating effective business planning, adequate levels of revenue generation and cost-effective management
- Inter-agency coordination mechanisms in place to regulate and manage economic activities within multiple use areas of the MCPAs

4 The Project's Contributions to Turkish Environmental Protection

- Contributions to the implementation of the Biological Diversity Convention Programme of Work on Protected Areas which Turkey has been a party will have been implemented.
- The country's system of Marine and Coastal Protected Areas will have been expanded by approximately 100,000 ha, or 44% as compared with baseline levels.
- Fisheries Restricted Areas (FRAs) will have been established within at least two Marine and Coastal Protected Areas and the sustainability of fisheries management achievements will be increased through the extension of a system of FRAs.
- The management capacities of local MCPA authorities will have been strengthened for effectively managing the existing Marine and Coastal Protected Areas.
- The Systems for sustainable Marine and Coastal Protected Area financing will have been strengthened.
- Inter-agency coordinating structures will have been strengthened.
- The agencies and other stakeholders will have been enabled to effectively address both land-based and marine-based threats to marine biodiversity.
- A national-level Marine and Coastal Protected Areas Strategy and Action Plan proposal will have been prepared.
- The sustainability of the MCPA system will have been ensured. The expected stream of positive, long-term impacts on marine biodiversity, and in particular those arising from a shift in current trends, is expected to be able to continue well beyond the Project's completion.

What is a Marine and Coastal Protected Area?

Marine and Coastal Protected Areas (MCPAs) can be established for different purposes, can be designed in different types and sizes and can be managed in different ways. Therefore, there are many different definitions of an MCPA.

The simplest definition of an MCPA is "a mechanism for the conservation of any defined marine area, by means of its legal and physical protection from significant human pressure, thus reserving its inherent natural, historical and cultural features.

Such conservation is maintained by appropriately enacted laws and especially through the support and involvement of the local communities and stakeholders.

Thus MCPAs have a potentially significant role to play in eliminating threats to marine biodiversity in Turkey.

5 Who is conducting this project?

The project is funded by the Global Environment Fund (GEF) and executed by the General Directorate of Natural Assets Protection (GDNAP) of the Turkish Ministry of Environment and Urbanization, in partnership with the General Directorate for Nature Conservation and National Parks (GDNCNP) of the Ministry of Forestry and Water Affairs, together with the General Directorate of Fisheries & Aquaculture of the Ministry of Food Agriculture and Livestock. The United Nations Development Program (UNDP) in Turkey is the implementing partner of the project.

The Ministry of Foreign Affairs, the Turkish General Staff, the Ministry of Development, the Turkish Coast Guard Command, the Turkish Naval Forces Command, the Ministry of Transportation Maritime Affairs and Communications, the Ministry of Culture and Tourism, the Marine and Coastal Management Department and Foreign Relations and EU Department of the Ministry of Environment and Urbanization, the Provincial Governors, together with such bodies as Local Authorities, universities, research institutes, national and local NGOs and other local representatives, are among the overall stakeholders of the Project.

Turkey's Marine and Coastal Protected Areas

- Turkey's Mediterranean, Aegean, Marmara and Black Sea coastline is 8,500 km long, excluding the islands. This wide marine and coastal fringe is home to a rich and valuable natural biodiversity. It is an immense and highly important zone, hosting some 3,000 plant and animal species.
- The majority of the existing marine and coastal protected areas are currently managed by GDNAP. In addition to these areas, the General Directorate for Nature Conservation and National Parks, the Ministry of Food, Agriculture and Livestock and the Ministry of Culture and Tourism are authorized to manage and plan the maintenance and careful development of some of the existing marine and coastal protection areas.
- An estimated 346,138 hectares of marine area is presently under legal protection within 31 Marine and Coastal Protected Areas. Currently, about 4% of Turkey's territorial waters is so protected.
- Turkey's marine biodiversity of is presently under serious pressure by human kind. The major dangers threatening Turkey's marine areas are the degradation of marine habitats and ecosystems, the over -harvesting of marine resources and the destruction of coastal habitats.


Ministry of Environment and Urbanization
General Directorate of Natural Assets Protection
Alparslan Türkeş Cad. 31. Sokak No:10 06510 Beştepe/Yenimahalle, Ankara
Tel: +90 312 222 1234/341 Fax: +90 312 222 2666
http://www.csb.gov.tr/gm/tabiat

United Nations Development Programme (UNDP)
Birlik Mah. 415.Cad. No:11 Cankaya/Ankara
Tel: +90 312 454 1100 Fax: +90 312 496 1463
www.undp.org.tr
Empowered Lives. Resilient Nations.