Black Sea Region

Contents Page

1 About

1.1 Overview

The Black Sea is the most isolated sea in the World. It is connected to the World Oceans via the Mediterranean Sea through the Bosphorus, Dardanelle and Gibraltar straits and with the Sea of Azov in the northeast through the Kerch Strait. Due to a large catchment area compared to surface area the Black Sea is very vulnerable to pressure from land based human activity and its health is equally dependent from the coastal and non-coastal states of its basin.

Eutrophication, pollution, and irresponsible fishing resulted in an overall decline of biological resources, the diversity of species and of the recreational values of the Black Sea. National efforts, and regional and international cooperation in the framework of the Bucharest Convention expressed in the concerted actions of the Strategic Action Plan brought the first signs of recovery to the Black Sea. The Convention on the Protection of the Black Sea Against Pollution was adopted in 1992 and ratified by Bulgaria, Romania, Russian Federation, Georgia, Ukraine and Turkey in 1994. The establishment of the Black Sea Environment Programme in 1993 and the Strategic Action Plan followed this shortly for the Rehabilitation and Protection of the Black adopted in 1996.

Land based sources of pollution, the introduction of alien species and inadequate resources management are some of the main issues highlighted in the Strategic Action Plan (SAP). The SAP is a step in the process towards attaining sustainable development in the Black Sea region. Its overall aims are to enable the population of the Black Sea region to enjoy a healthy living environment in both urban and rural areas, and to attain a biologically diverse Black Sea ecosystem with viable natural populations of higher organisms, including marine mammals and sturgeons, and which will support livelihoods based on sustainable activities such as fishing, aquaculture and tourism in all Black Sea countries. The concepts of sustainable development, precautionary principle and anticipatory actions, such as contingency planning, environmental impact assessment and strategic environmental assessment have been built into the SAP for the future. The Commission on the Protection of the Black Sea Against Pollution (BSC) and its Permanent Secretariat acts as the coordinating mechanism for the implementation of the Convention and SAP.

In June 2002, the SAP was revised by all member states, which reconfirmed their commitment to the original document. Currently the UNDP-GEF Black Sea Ecosystem Recovery Project (2002-2004) is underway, addressing basin wide eutrophication issues through reform of agricultural policies, improved municipal and industrial wastewater treatment, rehabilitation of key basin ecosystems and strengthening the legislative framework.

1.2 Key Dates

1992	The Convention on the Protection of the Black Sea Against Pollution (Bucharest Convention) was adopted on 21st April 1992 and its three protocols.
1993	The Black Sea Environment Programme was adopted
1994	The Bucharest Convention entered into force on 15th January 1994
1996	The Strategic Action Plan for the Rehabilitation and Protection of the Black adopted in Istanbul, Turkey, 30 - 31 October 1996
2000	The Memorandum of Understanding on Port State Control in the Black Sea Region (Black Sea MOU) was signed in April 2000
2002	The Strategic Action Plan for the Rehabilitation and Protection of the Black was amended in Sofia, Bulgaria 22-26 June 2002
2002	Protocol on the protection of biodiversity was signed at the Ministerial Meeting in Sofia (June 2002)

1.3 Geographic and General Information

Region: Black Sea
Participating States: Bulgaria, Georgia, Romania, Russian Federation, Turkey and Ukraine
Total Population: Approximately 297,856,008 in 2002
Length of Coastline: 4340 km (State of the Environment of the Black Sea 2002)
GIWA Regions: Subregion 22: Black Sea
Large Marine Ecosystems: LME #62: Black Sea
Map

1.3.1 Oceanographic Information

The seabed is divided into the shelf, the continental slope and the deep-sea depression. The shelf occupies a large area in the north-western part of the Black Sea, where it is over 200 km wide and has a depth ranging from 0-160 m. In other parts of the sea it has a depth of less than 100 m and a width of 2.2 to 15 km. The maximum depth of the Black Sea is 2,212 m. The surface area of the Black Sea is 432 000 km^2 with a total volume of 547 000 km^3 (State of the Environment of the Black Sea 2002).

The Black Sea circulation is characterized by a cyclonic system of currents that is common for the basin. In years with intensive thermodynamic conditions, a distribution of the general dynamic system into sub-basin systems western and eastern cyclonic whirls can occur in the air above the sea. The dynamic system of the Black Sea has a distinct yearly cycle. Maximum circulation intensity takes place in winter and spring when the sea accumulates potential and kinetic energy due to intensive winter thermodynamic interaction within the sea-atmospheric system (State of the Environment of the Black Sea 2002).

The replenishment of the bottom waters of the Black Sea with new seawater from the Mediterranean takes hundreds of years. This very slow rate of replenishment and the large input of freshwater have led to a stratification of the Black (Black Sea NGO Network 2004). The thin upper layer of marine water (up to 150 m) supports the unique ecosystem. The deeper and more dense water layers are saturated with hydrogen sulfide, that has accumulated from decaying organic matter (State of the Environment of the Black Sea 2002). The slow replenishment and the bad mixing of waters does not provide enough oxygen for the process of decomposition and the bacteria in the lower layers use it up entirely. Consequently the Black Sea is virtually dead below a depth of about 180 m and this boundary is being pushed up. Moreover the metabolism of some bacteria generates hydrogen sulphide, a soluble poisonous gas associated with the smell of rotten eggs. Hydrogen sulphide is present in the entire lower layer of seawater in the Black Sea (Black Sea NGO Network 2004)

1.3.2 Coastal Geography and Geology

The Black Sea is the most isolated sea in the World. It is connected to the World Oceans via the Mediterranean Sea through the Bosphorus, Dardanelle and Gibraltar straits and with the Sea of Azov in the northeast through the Kerch Strait. The Bosphorus is essentially a narrow elongated shallow channel approximately 31 km long, with a width varying between 0.7-3.5 km and a depth of 39-100 m (State of the Environment of the Black Sea 2002).

The catchment drainage area of the Black Sea is 2 000 000 km^2 with the total river inflow 340.6 km^3 (State of the Environment of the Black Sea 2002). The Rioni, Kodori, Inguri Chorokh, Kyzyl-Irmak, Eshil-Irmak, Sakarya, Southern Bug, Dnister,

the Danube, Dnieper and Don via the Sea of Azov are the main rivers that flow into the Black Sea (State of the Environment of the Black Sea 2002).

The geography and macro circulation processes existing in the Mediterranean Basin influence the climate of the Black Sea Basin which in the majority of the sea is similar to the Mediterranean climate (warm humid winters and hot dry summers). The south-eastern part, surrounded by the mountains, is characterized by a humid subtropical climate (abundant precipitation, warm winter, hot summer) (State of the Environment of the Black Sea 2002).

Total amount of precipitation from the Bosporus to Varna is about 500-700 mm per year, in the north, near Odessa 300-400 mm, in the southern coast of Crimea 586 mm. The amount of annual precipitation increases eastward – 1,600 mm between Novorossiysk and Sukhumi, to 2,465 mm in Batumi (State of the Environment of the Black Sea 2002).

1.3.3 Ecosystem Diversity

Therefore the Black Sea is now the largest natural anoxic water basin in the world. This means that 87 % of its volume is practically devoid of marine life, except for some forms of bacteria. However, the Sea is still comparatively rich in living resources. Also, the Black Sea shelf and river deltas are important spawning grounds for sturgeon and other fish species, and the coastal wetlands are migration and breeding grounds for numerous rare and endangered European birds (Black Sea NGO Network 2004).

1.3.3.1 Deep Ocean

The thin upper layer of marine water (up to 150 m) supports the unique biological life in the Black Sea ecosystem. The deeper and more dense are inhabited by more specific organisms, basically on the level of protozoa, bacteria, and some multi-cellular invertebrates inhabit the deep-sea waters. (State of the Environment of the Black Sea 2002). 40 representatives of benthic organisms identified as to species or genera, and family and 20 forms of organisms have been identified in the deep-water layers (450-2250 m) such as *Ciliata, Foraminifera, Nematoda, Kinorhyncha, Harpacticoida, Amphipoda, Ostracoda* and *Acarina.* (State of the Environment of the Black Sea 2002).

1.3.3.2 Seagrass Beds

There are six species of seagrasses in the Black Sea; *Zostera marina, Z. noltii, Potamogeton pectinatus, Ruppia maritima, R. spiralis* and *Zannichellia major* (Milchakova 1998). In shallow bays of the northwestern Black Sea marine grasses of the genus *Zostera* grow in extensive underwater meadows. Classification of Black Sea bottom vegetation distinguishes 5 associations of seagrasses constituting the formations of the community of marine flowering plants. Compared between off-shore and sheltered coastal water, total number of macrophytes in the communities varies from 17-78, correspondingly. Communities of *Zostera marina* display greatest diversity in the Kerch Strait with its special hydrological and hydrochemical conditions. The largest number of algal species concentrate at the depth 1-5 m. Seagrasses with short vegetation period, mostly red algae, dominate these phytocenoses. Epiphitic and unattached forms usually prevail over litophitic. Algae develop spring peak of species number both in sheltered areas and open sea. Eelgrass provides habitats for a diversity of marine organisms, for example, molluscs. The thicket of *Zostera spp*. is the spawning ground for 34 species of fish, many of them are commercially valuable. Seagrasses are an important element the coastal ecosystem and for this reson have been put under protection in two nature reserves, Chernomorsky and Azovosivashsky (Milchakova 1998)

1.3.3.3 Wetlands

The coastal wetlands occupy large areas and serve as a buffer zone between huge catchment areas and the Black Sea itself. The Black Sea wetlands include marsh reeds, forest dominated river flood plains, inland lakes and lagoons, deltas, marine lagoons, etc. The table below shows the Ramsar List of Wetlands of International Importance (2004) in the Black Sea member states. A map of the wetlands in the Black Sea region can be seen at the link:
http://www.blackseaweb.net/maps/content4.htm.

1.3.3.4 Beaches, Dunes and Cliffs

The warm coastal waters of the Black Sea are fringed with a myriad of sandy beaches, with the backshore being comprised of a variety different geographical coastal features ranging from sand dunes, wetlands, plains, mountains and outstanding limestone karst topography (Central Balkan, Bulgaria).

1.3.4 Species Diversity

1.3.4.1 Plants

There are a total of 1,610 species of fungi, algea and higher plants in the Black Sea (State of the Environment of the Black Sea 2002). Typical representatives of the algal flora are species of genera *Polysiphonia, Ceramium, Melobesia, Kylinia, Cladophora* and *Enteromorpha* (Milchakova 1998).

1.3.4.2 Phytoplankton and Zooplankton

The structure and abundance of phytoplankton species has been heavily affected by eutrophication that has been progressively developing from the late 70s to the 90s. As a general rule, the most favored species in eutrophic conditions are the small size plankton algae such as Dinoflagellates, Coccolithophores, Euglenoids and some others. At present, phytoplankton species composition is represented by 148 species and subspecies: *Bacillariophytae-69, Dinophyta-51, Chlorophyta-11, Cyanophyta-8, Chrizophyta-5, Euglenophyta-4* (State of the Environment of the Black Sea 2002).

Changes in phytoplankton lead to corresponding changes in zooplankton. Some zooplankton species that were abundant before the 1970s have become sparse or have disappeared. These include the population of copepods, *Pseudocalanus elongates, Paracalamus parvus, Centropages krojeri pontica, Pontella middeterranea, Anomalocera patersoni and cladoceran Penilia aavirostis*. Generally large species of crustacean zooplankton were replaced by smaller species. Of the original seven species of cladocerans in the Black Sea, four currently form part of the zooplankton community in the northwestern shelf of the Black Sea the smallest of them *Pleopis polyphemoides*, being the most abundant. There has also been an outburst in the number of gelatinous species, including the largest Black Sea jellyfish *Rizzhosstoma pulmo*, and the moon jellyfish *Aurelia aurita* (State of the Environment of the Black Sea 2002).

1.3.4.3 Benthos

There are a total number of 1,989 species of invertebrates in the Black Sea. 177 benthic species were recorded in Georgian territorial waters (State of the Environment of the Black Sea 2002). The following groups create the benthos biodiversity of Georgian coastline: *Sarcodina S. Rhizopoda, Spongia S. Porifera,*

Turbellaria, Nematoda, Polychaeta, Oligochaete, Phoronidae, Crustacea, mollusca, Echinodermata. The groups are represented as follows: Polychetae-64, molluscsc-59, from which Gastropoda –28 and Bivalvia-31, and Crustacea –36 species. Seven groups of invertebrates listed in the report were added and 5 more groups of organisms: *Sarcodina-2* species, and *Spongia, Turbellaria, Nematoda* and *Oligochaeta* as single species. Also, for the first time in the region, the Bivalvia mollusc - Cunearca cornea R. has been recorded (State of the Environment of the Black Sea 2002). Other species such as *Ciliata, Foraminifera, Nematoda, Kinorhyncha, Harpacticoida, Amphipoda, Ostracoda* and *Acarina* (State of the Environment of the Black Sea 2002).

1.3.4.4 Fish

There are a total number of 168 species of fish in the Black Sea (State of the Environment of the Black Sea 2002). Anchovy, Sprat, Horse mackerel, Whiting, Spiny dogfish, Turbot, Sturgeons (the giant sturgeon and the Russian sturgeon), Mullets (the golden mullet, the Red mullet, the leaping grey mullet and Pacific mullet), Atlantic bonito, Bluefish, Twaite, Shad and rays are the species of fish that can be found in the Black Sea (State of the Environment of the Black Sea 2002).

Spawning and Nursery Grounds of Regional Importance in the Black Sea are Sand bank "cocketrice" Seacoast in Bulgaria, it has the highest biodiversity of the soft bottom sublittoral along the Bulgarian Black Sea coast. The Poti-Ochamchire region of the Black sea shelf in Georgia is the main region of anchovy catches during the winter period. Other important spawing and nursery areas in Georgia are Supsa, Batumi and Gonio regions. The "Danube Delta" Biosphere Reserve in Romania is a traditional zone for spawning and feeding for transboudary species as well as a passage route for anadromous species (sturgeons, shad). Also the Marine Reserve 2 Mai - Vama Veche is an area with a high diversity of the biotops and biocoenosis, being settled on the migration routes of the main pelagic and benthic fish and marine mammals. The most important part of the Black Sea shelf for the Russian fishery sector is located between the Kerch Straits and Adler (river Psou mouth), its area is about 42,000 km^2. The densest accumulations of commercial fish species are observed in these areas. Other regions include the Kerch-Taman region, its width ranges from 20 -50 km and the Caucasus region. Important ares in Ukraine are the mouth of the Danube for the spawning of sturgeons and Clupeidae, the mouths of the Dniester, Dnieper and Bug, the Dnieper-Bug estuary (foraging area), the Black Sea Reserve Sivash, Zepnov's Phyllophora Field and the North-Western shelf of the Black Sea (State of the Environment of the Black Sea 2002).

1.3.4.5 *Birds*

The wetlands of the Black Sea basin are vital links in the network of wetlands that stretch from the Arctic Ocean to South Africa, providing refuge for 25 million migrating waterfowl every year. There are about 160 000 pairs of nesting waterfowl and 480 000 individual wintering birds in the Black Sea wetlands (Zaitsev *et al* 2004). The most significant habitats are situated in the coastal area of Romania (Danube Delta), Ukraine and the Russian Federation from the Danube Delta to the Tamansky Peninsula in the Kerch Strait. More than 75 % of the Black Sea birds concentrate here, and one third of their number inhabit the Danube Delta (Zaitsev *et al* 2004). There are 320 bird species in the Danube Delta (Zaitsev *et al* 2004). Of great importance in the Danube Delta are the pygmy cormorant *Phalacrocorax pygmeus*; the red-breasted goose *Branta ruficollis* (275 000 winter here, which is over one tenth of the world population); the white pelican *Pelecanus onocrotalus*; the Dalmatian pelican *Pelecanus crispus*; and the white-tailed eagle *Haliacetus albicilla* (eight pairs of this species in the Romanian part and three in the Ukrainian part of the delta). The region's sea birds include gulls (Larus) and terns (Sterna) (Zaitsev *et al* 2004). During migration seasons, the bird fauna is diversified by numerous species of sandpipers and ducks (Zaitsev *et al* 2004).

1.3.4.6 Mammals

There are four species of mammals - the monk seal (Monachus monachus) on the verge of extinction and three species of dolphins, the bottlenose dolphin (Tursiops truncatus ponticus), the common dolphin (Delphinus delphis ponticus) and the harbour porpoise (Phocaena phocaena relicta). The Reserve "Kaliakra in Bulgaria provides a high bio-diversity and habitat for the monkseal (State of the Environment of the Black Sea 2002).

1.3.5 Information on Participating States

1.3.5.1 Bulgaria

Total Population: 7,965,000 (World Bank 2002)
GDP (current US$): 15,485,890,000 (World Bank 2002)
Maritime Claims:
contiguous zone: 24 NM
exclusive economic zone: 200 NM
territorial sea: 12 NM (CIA 2003)
Length of Coastline: 300 km (State of the Environment of the Black Sea 2002)
Marine Protected Areas/Areas of Importance:

- Sand bank "cocketrice" Seacoast
- Reserve "Kaliakra

(State of the Environment of the Black Sea 2002).

1.3.5.2 Georgia

Total Population: 5,177,000 (World Bank 2002)
GDP (current US$): 3,396,263,168 (World Bank 2002)
Maritime Claims: N/A (CIA 2003)
Length of Coastline: 310 km (State of the Environment of the Black Sea 2002)
Marine Protected Areas/Areas of Importance:

- Poti-Ochamchire region of the Black sea shelf
- Supsa, Batumi and Gonio regions

(State of the Environment of the Black Sea 2002).

1.3.5.3 Romania

Total Population: 22,300,000 (World Bank 2002)
GDP (current US$): 45,749,071,872 (World Bank 2002)
Maritime Claims:
contiguous zone: 24 NM
territorial sea: 12 NM
continental shelf: 200-m depth or to the depth of exploitation
exclusive economic zone: 200 NM (CIA 2003)
Length of Coastline: 225 km (State of the Environment of the Black Sea 2002)
Marine Protected Areas/Areas of Importance:

- The "Danube Delta" Biosphere Reserve
- The Marine Reserve 2 Mai - Vama Veche

(State of the Environment of the Black Sea 2002).

1.3.5.4 Russian Federation

Total Population: 144,071,008 (World Bank 2002)
GDP (current US$): 346,519,928,832 (World Bank 2002)
Maritime Claims:
continental shelf: 200-m depth or to the depth of exploitation
exclusive economic zone: 200 NM
territorial sea: 12 NM (CIA 2003)
Length of Coastline: 475 km (State of the Environment of the Black Sea 2002)

Marine Protected Areas/Areas of Importance:

- Kerch-Taman region
- Caucasus region

(State of the Environment of the Black Sea 2002).

1.3.5.5 Turkey

Total Population: 69,626,000 (World Bank 2002)
GDP (current US$): 183,664,852,992 (World Bank 2002)
Maritime Claims:
exclusive economic zone: in Black Sea only
territorial sea: 12 NM in Black Sea (CIA 2003)
Length of Coastline: 1400 km (State of the Environment of the Black Sea 2002)

1.3.5.6 Ukraine

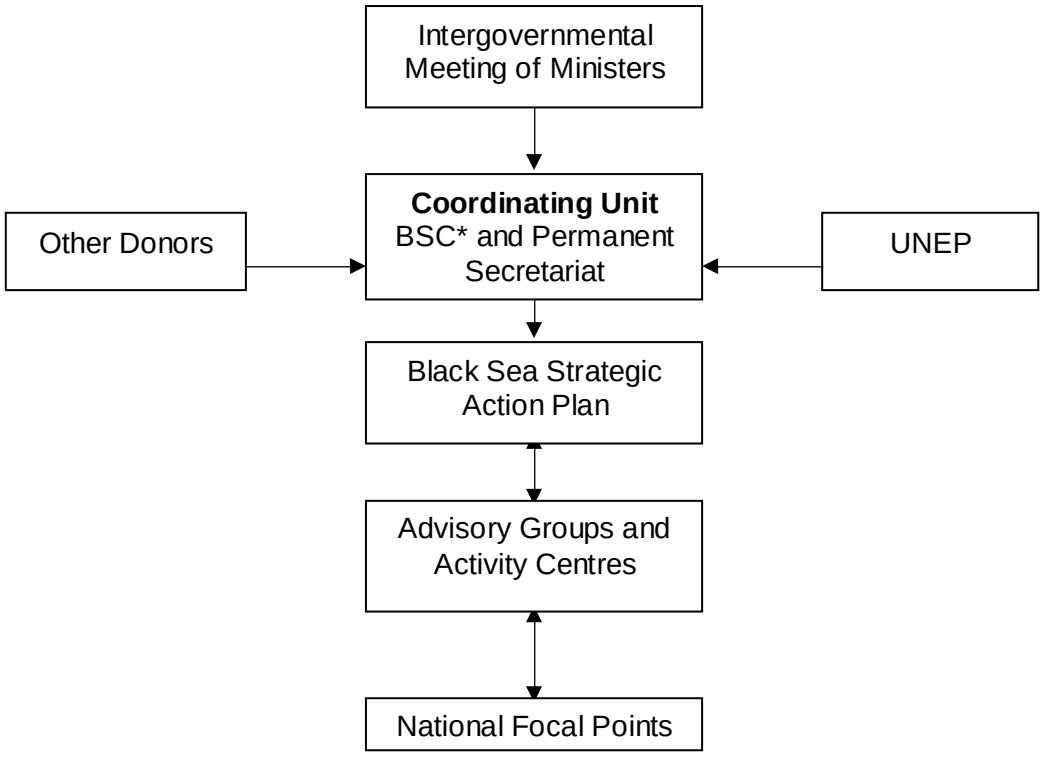
Total Population: 48,717,000 (World Bank 2002)
GDP (current US$): 41,477,115,904 (World Bank 2002)
Maritime Claims:
continental shelf: 200-m or to the depth of exploitation
exclusive economic zone: 200 NM
territorial sea: 12 NM (CIA 2003)
Length of Coastline: 1628 km (State of the Environment of the Black Sea 2002)
Marine Protected Areas/Areas of Importance:

- Mouths of the Danube, Dniester, Dnieper and Bug
- Dnieper-Bug estuary
- Black Sea Reserve Sivash
- Zepnov's Phyllophora Field
- North-Western shelf of the Black Sea
- Marine Reserve Zmeiny (Snake) Island

(State of the Environment of the Black Sea 2002).

1.4 Organization

1.4.1 Institutional Structure



1.4.2 Ministerial Meetings

Ministers responsible for the rehabilitation and protection the Black Sea states will meet every five years with the objective of evaluating the progress made in implementing this Strategic Action Plan and adopting any additional actions that may be required to attain its overall aims.

1.4.3 Coordinating Unit

The implementation of the Convention and Strategic Action Plan (SAP) is overseen by a The Commission on the Protection of the Black Sea Against Pollution (BSC) with a permanent Secretariat based in Istanbul.

The role of the BSC is to establish a body to provide support for specific projects and processes related to the implementation of this SAP and to establish, on the basis of the current structure of Black Seas Environment Programme Working Parties, subsidiary bodies (Advisory groups) which can assist it in the implementation of the SAP.
The BSC regularly reviews the status and functions of the Advisory Groups and considers the establishment of ad hoc groups for the purposes of implementing this SAP.

The BSC is responsible for the operation and maintenance of the electronic communication system which has been established for purposes of facilitating communication between the components of the Black Sea institutional network and assumes the responsibilities from the Black Seas Environment Programme-Programme Coordinating Unit (BSEP-PCU) for the clearing house mechanism for the exchange of information on bibliography, data sources and research programmes (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996)

Permanent Secretariat
Executive Director
Mr. Plamen Dzhadzhev
Pollution Monitoring and Assessment Officer
Dr. Oksana Tarasova
Technical Assistant
Sabina Salpagarova

Contact:
Mr. Plamen Dzhadzhev
Dolmabahce Saray
2. Hareket Kosku
34353 Besiktas,
Istanbul, Turkey
Telephone: [+90 212] 227 99 27
Fax: [+90 212] 227 99 33
e-mail: pdzhadzhev@blacksea-commission.org

Website: http://www.blacksea-commission.org.

1.4.4 Advisory Groups and Activity Centres

The purpose of the advisory groups is to provide the Commission with the best possible advice and information on topics, which are key to the implementation of this Strategic Action Plan and the Bucharest Convention. The groups include experts

from focal points from all Black Sea states. Involvement of relevant NGOs is encouraged, particularly in the improvement of public participation and awareness in all of the focal areas covered by the Groups. The Advisory Groups are supported by Activity Centres, which coordinate the necessary programmatic support and the provision of practical technical support for their work. Advisory Groups sometimes liaise together and joint groups are set up, particularly on such issues as pollution assessment, fisheries development and environmental impact assessment (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996)

1.4.4.1 Environmental Safety Aspects of Shipping

Advisory Group on the Environmental Safety Aspects of Shipping coordinated by the Activity Centre in Varna, Bulgaria

The Group coordinates the regional approach to emergency response, particularly the international response to accidents involving the extraction, maritime transport, handling and storage of oil and, where relevant, hazardous chemicals. It also coordinates, on behalf of the Commission, regional aspects of implementation of the MARPOL Convention defined in the Black Sea Strategic Action Plan (BS-SAP). Furthermore, it assists with the elaboration of port-state-control procedures defined in the BS-SAP. Particular attention is paid to developing a strong working relationship between Ministers of Environment and Transport both internationally and within corresponding national focal points. It collaborates closely with all relevant institutions and governmental bodies, international organizations (such as IMO, WMO, IOC) and the private sector (shipping, oil and gas industries) (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

1.4.4.2 Pollution Monitoring and Assessment

Advisory Group on Pollution Monitoring and Assessment coordinated by the Activity Centre in Odesa, Ukraine

The work of this Group focuss upon the establishment of a regionally coordinated network of National Status and Trends monitoring programmes and the subsequent development of Environmental Quality Objectives. Specifically, the Group shall provide the following services:

(1) Quality Assurance/Quality Control services for environmental chemical analysis;
(2) Coordination of pilot monitoring activities;
(3) Coordination of regional training exercises in monitoring;
(4) Coordination of regional multi-disciplinary expert consultations to develop common environmental objectives and standards for different water uses in the Black Sea. The Group collaborates closely with the Advisory Group on the Environmental Aspects of the Management of Fisheries and other Living Marine Resources for the development of a region-wide programme for monitoring the biological effects of pollution to be incorporated in the regional monitoring strategy, as well as with National Monitoring Networks and research institutions in all Black Sea countries, international research programmes and projects and bodies such as IAEA`s Marine Environmental Laboratory, IOC`s Expert Groups, UNEP, WHO and WMO; and
(5) coordination, in close cooperation with WHO of programmes to monitor the quality of bathing waters and beaches and assessment of the human health implications (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

1.4.4.3 Control of Pollution from Land Based Sources

Advisory Group on Control of Pollution from Land Based Sources coordinated by the Activity Centre in Istanbul, Turkey

The Group provides the technical support for actions related to the assessment and control of discharges of pollution from land-based sources (direct discharges, river inputs and diffuse sources, including atmospheric deposition). It covers the following areas:

(1) The development and diffusion of improved methodology for measuring discharges of pollutants;
(2) The gathering of data from National Focal Points regarding discharges;
(3) The coordination of activities to improve permitting procedures; and
(4) The development/harmonization of pollution discharge models and scenarios in order to assist with the establishment of scientific criteria for setting permit levels/emission standards; and the major partners of the Group shall be regional inspectorates of pollution (or their equivalent) and, at an international level, the Secretariat of the Global Programe of Action for Protection of the Marine Environment from Land-based Activities (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

1.4.4.4 Integrated Coastal Zone Management

Advisory Group on the Development of Common Methodologies for Integrated Coastal Zone Management (ICZM) coordinated by the Activity Centre in Krasnodar, Russia

The Group facilitates the exchange of information and experience on ensuring sustainable resource use, including recreational use by tourists in the coastal zones of Black Sea countries, and develops methodologies for coastal zone management, with particular reference to threats to the environment arising from the transition to market economies. The Group coordinates and supervises the elaboration of draft recommendations of the Commission in the field of ICZM and, based on common methodology, assist with the introduction of contemporary principles of environmental management, such as “Best Available Technology” and “Best Environmental Practices”. On the basis of the agreed common principles and the achievements and experience gained in the Black Sea countries, the Group will coordinate the preparation of Regional ICZM Programme as well as to provide assistance for the preparation of national programmes. This Group also works in very close cooperation with the OECD and other international institutions (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

1.4.4.5 Conservation of Biological Diversity

Advisory Group on the Conservation of Biological Diversity coordinated by the Activity Centre in Batumi, Georgia

The Group provides coordination and technical support for actions taken to protect the biological diversity in the Black Sea according to the provisions of the Odesa Declaration, Black Sea Strategic Action Plan, the UN Convention on Biological Diversity and the Pan-European Strategy on Landscape and Biological Diversity. The Group prepares inventories of the biodiversity and regularly updates them, in order to evaluate the trends and recommend remedial actions. It also gathers historical records of changes in biological diversity.The Group constructs a Regional Biological Diversity Conservation Strategy as well as Draft Biological Diversity and Landscape Protection Protocol to the Convention on the Protection of the Black Sea Against Pollution. The Group coordinates the preparation of a Red Data Book on the

endangered species (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

1.4.4.6 Management of Fisheries and Marine Living Resources

Advisory Group on the Environmental Aspects of the Management of Fisheries and other Marine Living Resources coordinated by the Activity Centre in Constanta, Romania

The Advisory Group coordinates activities and provides technical support for the protection and restoration of marine ecosystems. The data will be gathered from all national authorities and should include historical records in order to document past changes in the production and stock in the region and its relationship to changes in marine ecosystems. It will provide the basic source of information for future management strategies and for the implementation of the future Fisheries Convention. The Group develops proposals and, where appropriate, coordinates the following:

(1) Harmonization at the regional level of a legal and institutional framework aimed at sustainable use of living marine resources;
(2) Improvement of Black Sea fisheries resource assessment based on a regional approach;
(3) Development of projects for the protection and rehabilitation of living resources; and
(4) Development of specific projects for aquaculture techniques, which do not harm biological diversity. The Group collaborates with regional and international institutions (such as GFCM), governmental bodies and the private sector (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

1.4.4.7 Information and Data Exchange

Advisory Group on Information and Data Exchange to be coordinated by the Commission Secretariat

This Group focuses its work on the improvement of information flow and data exchange. It is responsible for the following specific tasks:

(1) Updating of the existing Black Sea Information System and Black Sea Geographical Information System;
(2) Updating of the Black Sea Bibliography;
(3) Strengthening of the e-mail network and improvement of Internet connection to the Web Server services for principle data centres and Ministries of Environment for the exchange of information and data, including exchange of meta data;
(4) Development of the regional Internet facility comprising meta level information on environmental data, sets of the new data obtained from various international programmes, including those of the Commission, copies of historical data opened for public use, data sets from main World data centres such as WDC, GRID and others;
(5) Cooperation and data exchange with different international programmes in the Black Sea region such as NATO-TU, EROS-21, CoMSBlack, etc;
(6) Cooperation and data exchange with the NGO Network;
(7) Organization of training on data exchange; and
(8) Assistance to other networks in the region (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

1.4.5 Working Groups

- Ad hoc Working Group on the Water Framework Directive
- Joint Black Sea – Danube Technical Working Group

1.5 Financial Arrangements

The funding for the actions agreed upon in this Black Sea Strategic Action Plan (BS-SAP) are secured from domestic, regional or international sources, through general public funding or through the application of specific economic instruments, as well as through grants and loans. Specific projects for international funding are prepared for bilateral or multilateral funding. Donor Conferences, for assisting in this process, are held on a five yearly basis and began in 1997. Specific funding arrangements for the national policies and measures agreed on in this BS-SAP presented in the National Black Sea Strategic Action Plans adopted by each of the Black Sea State.

1.5.1 Black Sea Environmental Fund

The main source of finance for the Fund shall be a set of economic instruments adopted at the national level, as well as, additional funding from the international community, including multilateral and bilateral donor organizations, international financial institutions and private sector sources. The Fund is used to finance the work of the Istanbul Commission; the development of project proposals for submission to potential funding sources; and specific projects which support the priorities set in the BS-SAP or as decided on by the Istanbul Commission (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

1.6 Wider Cooperation

Black Sea Strategic Action Plan aims to encourage:

1. Enhanced coordination between the regional bodies, such bodies include the Istanbul Commission and its subsidiary bodies, the Black Sea Economic Cooperation (BSEC), the Parliamentary Assembly for the Black Sea Economic Cooperation (PABSEC), the future Black Sea Fisheries Commission, and the NGO Forum;
2. Close cooperation between the regional governmental bodies and the NGO Forum;
3. Close coordination of the activities of donors, including multilateral financial institutions, the European Union, bilateral aid agencies and private foundations, in their aim to secure funding for projects and policies;
4. Close cooperation with relevant international organizations, including UN Agencies and international non-governmental organizations;
5. International agreements relevant to the aims and objectives of this Strategic Action Plan should be implemented by each Black Sea state (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

For information on Conventions to which the Black Sea Costal States are Contracting Parties and to Multilateral and Bilateral Agreements between the Black Sea Coastal States that are relevant to the Protection and Rehabilitation of the Black Sea refer to:

Implementation of the Black Sea Strategic Action Plan Report 1996 - 2000 Annexes
http://www.blacksea-commission.org/main.htm

1.7 Partners

Refer to Regional Seas Partnerships page on the main website.

2 Our Work

2.1 Programme Strategy

Link to Regional Seas Strategic Directions 2004-2007, downloadable document.

2.2 Action Plan

Black Sea Environment Programme
Year Adopted: 1993 (UNEP 2001)
Strategic Action Plan for the Rehabilitation and Protection of the Black Sea
Year adopted: Istanbul, Turkey, 30 - 31 October 1996
Amended: Sofia, Bulgaria 22-26 June 2002
Participating Countries: Bulgaria, Romania, Russian Federation, Georgia, Turkey and Ukraine (UNEP 2001)

Main Principles of the Strategic Action Plan:

- The concept of sustainable development;
- The precautionary principle;
- Anticipatory actions, such as contingency planning, environmental impact assessment and strategic environmental assessment (involving the assessment of the environmental consequences of governmental policies, programmes and plans);
- The use of clean technologies, which require the replacement or phasing-out of high waste and waste generating technologies that remain in use;
- The use of economic instruments that foster sustainable development;
- Environmental and health considerations;
- Close cooperation among Black Sea coastal states, in adopting interim arrangements which facilitate the rehabilitation of and protection of the Black Sea ecosystem and the sustainable management of its resources;
- Cooperation among all Black Sea basin states;
- The involvement of stakeholders in the implementation of this Strategic Action Plan;
- Transparency and public participation.

Link to the full Action Plan text: http://www.blacksea-environment.org/

2.3 Convention

The Convention on the Protection of the Black Sea Against Pollution
Short Title: Bucharest Convention
Year adopted: 21st April 1992 (UNEP 2001)
Year entered into force: 15th January 1994 (with the ratification's of Bulgaria, Romania, Russian Federation and Georgia). Turkey ratified on 29 March 1994, Ukraine on 15 April 1994.
Contracting Parties: Bulgaria, Romania, Russian Federation, Georgia, Turkey and Ukraine (UNEP 2001)
Depositary State: Romania
Ratification:

Country	Signed	Ratified	Entry into force
Bulgaria	21-04-1992	23-02-1993	15-01-1994
Georgia	21-04-1992	01-09-1993	15-01-1994
Romania	21-04-1992	10-11-1993	15-01-1994
Russian Federation	21-04-1992	16-11-1993	15-01-1994
Turkey	21-04-1992	29-03-1994	29-03-1994
Ukraine	21-04-1992	14-04-1994	14-04-1994

Source: Black Sea Commission (2004)

Main Objectives:

- To prevent pollution by hazardous substances or matter;
- To prevent, reduce and control the pollution from land-based sources;
- To prevent, reduce and control the pollution of the marine environment from vessels in accordance with the generally accepted rules and standards;
- To prevent, reduce and control the pollution of the marine environment resulting from emergency situations;
- To prevent, reduce and control the pollution by dumping;
- To prevent, reduce and control the pollution caused by or connected with activities on the continental shelf, including exploration and exploitation of natural resources;
- To prevent, reduce and control the pollution from or through the atmosphere;
- To protect the biodiversity and the marine living resources;
- To prevent the pollution from hazardous wastes in transboundary movement and the illegal traffic thereof; and
- To provide framework for scientific and technical co-operation and monitoring activities.

Link to the full Convention text: http://www.blacksea-environment.org/

2.3.1 Protocols

Protocol on Protection of the Black Sea Marine Environment Against Pollution from Land Based Sources
Year adopted: 21st April 1992 (UNEP 2001)
Year entered into force: 15th January 1994 (with the ratification's of Bulgaria, Romania, Russian Federation and Georgia). Turkey ratified on 29 March 1994, Ukraine on 15 April 1994.

Contracting Parties: Bulgaria, Romania, Russian Federation, Georgia, Turkey and Ukraine

Protocol on Cooperation in combating pollution of the Black Sea Marine Environment by Oil and Other Harmful Substances in Emergency Situations
Year adopted: 21st April 1992 (UNEP 2001)
Year entered into force: 15th January 1994 (with the ratification's of Bulgaria, Romania, Russian Federation and Georgia). Turkey ratified on 29 March 1994, Ukraine on 15 April 1994.
Contracting Parties: Bulgaria, Romania, Russian Federation, Georgia, Turkey and Ukraine

Protocol on The Protection of The Black Sea Marine Environment Against Pollution by Dumping
Year adopted: 21st April 1992 (UNEP 2001)
Year entered into force: 15th January 1994 (with the ratification's of Bulgaria, Romania, Russian Federation and Georgia). Turkey ratified on 29 March 1994, Ukraine on 15 April 1994.
Contracting Parties: Bulgaria, Romania, Russian Federation, Georgia, Turkey and Ukraine

Black Sea Biodiversity and Landscape Conservation Protocol
Signed: Sofia, Bulgaria 2003 and is to be ratified shortly.
Contracting Parties: Bulgaria, Romania, Russian Federation, Georgia, Turkey and Ukraine

To link to full text of the Protocols: http://www.blacksea-environment.org/

2.4 Issues and Threats

2.4.1 Habitat and Species Loss

A large number of wetlands with rich biodiversity and a recognized value for migratory waterfowls continue to be the focus of environmental conservation and are under threat (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

Dolphins (common, harbor porpoise and bottlenose) are down to a population of 500,000 due to accidental killings, gill net fishing, the destruction of coastal ecosystems and various forms of pollution. Other marine mammals are critically endangered. The monk seal is virtually extinct. The productive fishery of the Black Sea Oyster, indigenous to the area, has been destroyed through the introduction of exotic species in ballast waters (Black Sea 2004).

For further information refer to:
Balkas, T., et al. 1990. Review of the state of the marine environment of the Black Sea. UNEP Regional Seas Reports Studies No. 124. UNEP, Nairobi.
Biological Diversity in the Black Sea (1997) A Study of Decline and Change.
State of the Environment of the Black Sea (2002) Pressures and Trends 1996-2000. Istanbul 2002
Large Marine Ecosystem #62: Black Sea http://na.nefsc.noaa.gov/lme/text/lme62.htm

2.4.2 Land Based Sources of Pollution

The Black Sea ecosystem continues to be threatened by inputs of certain pollutants, notably nutrients. Nutrients enter the Black Sea from land based sources, and in particular through rivers. The Danube River accounts for well over half of the nutrient input to the Black Sea. Eutrophication occurs over wide areas of the Black Sea. The overall yearly input of nutrients from human activity amounts to 647,000 tons of nitrogen and 50,500 tons of phosphorus (State of the Environment of the Black Sea 2002). Inputs of insufficiently treated sewage result in the presence of microbiological contaminants, which constitute a threat to public health and in some cases pose a barrier to the development of sustainable tourism and aquaculture. In addition, inputs of other harmful substances, especially oil, continue to threaten the Black Sea ecosystem. Oil can also enter the environment through land based sources. Almost half of the inputs of oil originating from land based activities are brought to the Black Sea via the Danube River (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

For further information refer to:
Balkas, T., et al. 1990. Review of the state of the marine environment of the Black Sea. UNEP Regional Seas Reports Studies No. 124. UNEP, Nairobi.
State of the Environment of the Black Sea (2002) Pressures and Trends 1996-2000. Istanbul 2002
GEF, 1997. Black Sea Transboundary Diagnostic Analysis. UNEP, New York, 142 pages.

2.4.3 Sea Based Pollution

Oil pollution is a concern for the Black Sea environment in particular due to increasing risk of accidental spills that may result from the expected twofold increase of oil transit by tankers. The freight flow of this oil resource from Middle Asia and Azerbaijan via Georgia is gradually increasing. Over 20 million tones of oil and petroleum products are transported via these terminals in Georgia to the west through the Black Sea (State of the Environment of the Black Sea 2002).

Polyaromatic hydrocarbons (PAHs) constitute a critical part of oil pollution having proven carcinogenic and mutagenic effects. In bottom sediments, the highest levels were detected near Odesa, the Danube coastline and in Sochi, the Russian Federation (State of the Environment of the Black Sea 2002). In Bulgarian territorial waters the maximum concentration of PAHs was 58.13 and the minimum 5.15 ng per L. In Romania concentrations of PAHs varies between 0.09 and 49.24 ng/ per g in bottom sediments. The Russian Federation does not monitor PAHs in marine waters.There is no data for Turkey. In the territorial waters of Ukraine, concentrations of PAHs varied between 0.7-250.1 ?g/l in marine waters, and between 0.4-137.9 ?g/kg in bottom sediments Federation (State of the Environment of the Black Sea 2002).

For further Information refer to:
Balkas, T., et al. 1990. Review of the state of the marine environment of the Black Sea. UNEP Regional Seas Reports Studies No. 124. UNEP, Nairobi.
State of the Environment of the Black Sea (2002) Pressures and Trends 1996-2000. Istanbul 2002
Black Sea. Regional Profiles. A Summery of the risk of oil spills and state of preparedness in UNEP Regional Seas Regions. ITOPF.
http://www.itopf.com/country_profiles/profiles/blacksea.pdf.

2.4.4 Alien Species

The introduction of exotic species, through the deballasting of vessels, has seriously damaged the Black Sea ecosystem (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996). Intensive marine traffic results in large quantities of discharged ballast waters and the consequent introduction of alien species that compete for food with the indigenous species or, in the absence of the natural enemies, develop an intensive biomass. The exotic species arrive in the Black Sea attached to the ships' hulls, and might intentionally be brought for aquaculture purposes (State of the Environment of the Black Sea 2002). Among the newly introduced alien species, 34 % have been imported for aquaculture and 66 % have entered the Black Sea as pelagic larvae in ballast waters and/or fouling organisms on ship hulls. The number of introduced species is continuously increasing. About one fourth of them (8 species) have invaded the Black Sea in the last decade. Most of the newcomers are fish imported for fish farming. Examples of alien species in the Black Sea are the Bay barnacle *Balanus improvisus*, Comb jelly *Mnemiopsis leidyi,* Soft-shelled clam *Mya arenaria, Rapana Rapana thomasiana thomasian*, White-fingered mud crab *Rhithropanopeus harrisi tridentata* and the fish *Haarder Mugil soiuy* (State of the Environment of the Black Sea 2002).

For further Information refer to:
Balkas, T., et al. 1990. Review of the state of the marine environment of the Black Sea. UNEP Regional Seas Reports Studies No. 124. UNEP, Nairobi.
State of the Environment of the Black Sea (2002) Pressures and Trends 1996-2000. Istanbul 2002

2.4.5 Integrated Coastal Zone Management

Inadequate resources management and, in particular, inadequate policies with respect to fisheries and coastal zone management continue to impede the sustainable development of the Black Sea region. Most fish stocks in the Black Sea, already stressed as a consequence of pollution, have been over exploited or are threatened by over exploitation; many coastal areas have deteriorated as a result of erosion and uncontrolled urban and industrial development, including the resultant construction activities. Consequently, there is a serious risk of losing valuable habitats and landscape and ultimately, the biological diversity and productivity of the Black Sea ecosystem (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996). Erosion and land degradation have important environmental and social impacts. Coastal erosion, due to the changed hydraulic conditions in many of the regions rivers, is a problem which has transboundary implications. Deforestation is another major factor contributing to land degradation (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

2.4.6 Exploitation of Resources

Fish are an integral part of the marine ecosystem, fish stocks thrive in a non-polluted and protected ecosystem and the marine ecosystem profits from properly managed fishing activities (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996). Fish stocks in the Black Sea have been declining. The combination of uncontrolled fisheries and eutrophication is causing important alterations in the structure and dynamics of the Black sea (Black Sea 2004). Some valuable species such as mackerel, bonito and horse mackerel in the Black Sea have practically disappeared (State of the Environment of the Black Sea 2002). Anchovy has declined due largely to the *Mnemiopsis leidyi* invasion from the Atlantic Ocean.

The Black Sea horse mackerel has almost disappeared in the waters of Ukraine, Georgia and Turkey. Turbot stocks are severely depleted due to the poor environmental quality of shelf waters that prevents recovery of these species, unsatisfactory fishing practices (fishing gears) and illegal fishing. Turbot fishing, at least in the spawning period, should be prohibited, until a regional estimate of the actual state of the stock. The Spiny dogfish stock has declined in most areas, although relatively immune to *Mnemiopsis leydyi*. Commercial fishing should not exceed a sustainable level, and the migration routes should be protected. Species of sturgeon, such as the giant sturgeon, are endangered, while others are depleted (State of the Environment of the Black Sea 2002).

The quality of nursery and spawning grounds plays a crucial role in the reproduction of fish stocks yet the construction of dams and hydraulic structures is keeping the anadromous species like sturgeons from their natural spawning grounds in the estuaries of Danube and Dnipro Rivers. Therefore, these anadromous fish species currently depend on industrial breeding. Fishing activities during spawning period are strictly prohibited in all Black Sea states. However, illegal fishing is common in the current economic conditions and damages the success of breeding efforts, in particular in cases of sturgeons and turbots. Most of them need special protection and remedial measures in order to safeguard the successful replenishment of fish stocks in the Black Sea (State of the Environment of the Black Sea 2002).

For further Information refer to:
Balkas, T., et al. 1990. Review of the state of the marine environment of the Black Sea. UNEP Regional Seas Reports Studies No. 124. UNEP, Nairobi.
State of the Environment of the Black Sea (2002) Pressures and Trends 1996-2000. Istanbul 2002

2.5 Current Activities

2.5.1 Land Based Sources of Pollution

There are numerous activities and measures being undertaken to deal with the problems of land based sources of pollution. For example a Black Sea Basin Wide Strategy aims to address the eutrophication problem in a series of stepwise reductions of nutrient loads, until agreed Black Sea water quality objectives are met. Most importantly for the River Danube as it is the largest single source of nutrient inputs into the Black Sea (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996). A list of high priority sites (hot-spots) for reducing discharges of pollutants has been developed providing the basis for the elaboration of national strategies and timetables for realizing substantial reductions of inputs of pollutants from hot-spots, in accordance with agreed water quality objectives (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

Comprehensive national studies on the discharges of insufficiently treated sewage are being prepared by each Black Sea state through the Advisory Group on the Control of Pollution from Land-Based sources to be adopted and implemented, in accordance with their own legal system, the laws and enforcement mechanisms required for regulating discharges from point sources. The basis for regulating discharges is a licensing system, through which the harmonised water quality objectives are applied, and through which effluent charges, based on the polluter pays principle, can be levied. The introduction of policies in which polluters are made

to pay for compliance is also being considered. The application of environmentally friendly production processes or other innovative process which reduce inputs of pollutants is also be encouraged through economic incentives (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

A total ban on the disposal of municipal garbage in marine, shoreline and estuarine areas has been imposed since December 1996. The Black Sea coastal states cooperate in developing and implementing environmentally sound waste management policies, giving due consideration to waste minimization, recycling and reuse. A "State of Pollution of the Black Sea" report is prepared and published every five years based on the data collected through the coordinated pollution monitoring and assessment programmes. A Black Sea Monitoring System, based upon biological effects measurements and measurements of key contaminants. It consists of the integration of national monitoring programmes and an independent quality assurance system. Black Sea states, individually and jointly, take measures to control any dumping activities that may take place. Black Sea states also define concentration levels for trace contaminants in dredged spoils (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996). A uniform measurement technique for bathing water quality with a common quality assurance support mechanism is being developed. There are annual publications and free exchange of data from bathing water quality measurements (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

2.5.1.1 Current Projects

Control of eutrophictation, hazardous substances and related measure for rehabilitating the Black sea Ecosystem
Cost ($): 11,332,106
Period: July 2004 – June 2007
Partners: GEF, UNDP, UNOPS, Bulgaria, Georgia, Romania, Russian Federation, Turkey and Ukraine
Expected Outputs:

- Supporting the consolidation and operation of institutional mechanism for cooperation under the Convention;
- Development of policy guidelines, legal and institutional instruments for nutrient reduction from LBA and protection of ecosystems coastal zones;
- Development of economic instruments and promotion of investment opportunities in coastal zones for pollution control and protection of ecosystems;
- Development of operational systems for monitoring, information management and research under the Convention; and
- Strengthening of public participation in environmental protection through access to information stakeholder training and awareness raising and implementation of community actions (Small Grants Programmes).

http://www.gefweb.org/Documents/Council_Documents/GEF_C23/IW_-_Regional_-_Black_Sea_Ecosystem_-_Project_Document.pdf**.** (UNEP 2004)

Black Sea Ecosystem Recovery Project
Period: 2000-2006
Partners: Black Sea Commission, UNDP, UNEP, WHO, and EU Tacis
Objective: To improve ecosystem health of the Black Sea by reducing inputs of nutrients and hazardous substances from land based activities (Regional Seas 2003).
http://www.blacksea-environment.org/text/default.htm.

2.5.2 Sea Based Pollution

Due to the rapid increase in traffic to Black Sea ports, the capacity of harbour reception facilities needs to be enlarged in order to comply with MARPOL 1973/78 Special Area requirements. Harbour reception facilities were installed:

(1) For garbage;
(2) For oil; and
(3) For chemicals.

The use of these facilities shall be made compulsory. In installing harbour reception facilities close cooperation with the private sector will be pursued, the advice of the IMO will be requested, and the results of the study conducted by the BSEP and the European Union will be taken into account.

The Memorandum of Understanding on Port State Control in the Black Sea Region (Black Sea MOU was signed in April 2000. A harmonised system of enforcement, including fines, will be developed for the Black Sea region. Black Sea states shall exercise their prescriptive and enforcement powers, in accordance with international law, in order to pursue the reduction of illegal discharges by vessels into the Black Sea.

A Black Sea Strategy for contingency planning and emergency response is being developed. This Strategy will provide a basis for ensuring that the contingency plans developed within Black Sea states are sufficiently coordinated. It will also serve as a basis for the development of the regional contingency plan. The Black Sea Contingency Plan will address the compatibility of:

(1) Emergency equipment, reporting forms and oil spill data;
(2) Classification of the scale of spillage's;
(3) Methods for evaluating the sensitivity of the coast to hazards; and
(4) Spill decision support systems, including models for forecasting oil movements.

National and local contingency plans, covering both vessels and offshore installations are being improved (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

2.5.3 Exploitation of Resources

In order to rehabilitate ecosystems, which are of particular importance to Black Sea fisheries as a whole, Phyllophora fields and other critical nursery areas receive special protection, spawning areas of anadromous species will be restored, and coastal lagoons will be rehabilitated. Each Black Sea state is developing pilot projects, which will contribute to the restoration of areas vital to the recovery of Black Sea fish stocks. The Black Sea coastal states are adopting the Fisheries Convention so as to develop a fisheries management system, which consists of the following components:

(1) Regular regionally coordinated stock assessments;
(2) National fishing authorisations for all Black Sea fishing vessels;
(3) A regional licensing system; and
(4) A quota system.

In addition, the enforcement of fisheries regulations is being improved. These measures and others are taking place in close cooperation with the fishing sector (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

2.5.4 Biological Diversity Protection

A Regional Strategy for Conservation Areas has been adopted, and it shall be reviewed every five years. The plan, amongst other things, will address the following: priority locations, which should be designated as conservation areas; priority locations where current measures for protection should be enhanced; objectives, standards and measures for the protection of conservation areas; and fund raising aspects.

Each Black Sea state is revising, and where applicable adopting, in accordance with its own legal system, national laws, regulations and planning instruments for the protection of conservation areas that will conform with relevant international instruments, including the Regional Strategy for Conservation Areas. The national instruments, amongst other things, will identify the responsible management authority and the responsible government agency; include procedures for the identification of conservation areas; require that management plans be developed for each conservation area; set standards for managing conservation areas; and, where appropriate, establish procedures for public participation and partnerships between governmental agencies and NGO's for the management of conservation areas.

Public awareness campaigns, including programs for schools, local communities, and natural resource users in the conservation areas are being developed at the regional level (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

A regional Black Sea Red Data Book, identifying and describing endangered species, has been prepared through the Advisory Group on the Conservation of Biological Diversity.

The Wetlands International Black Sea Programme Black Sea Wetlands Conservation Priorities adopted priorities for Black Sea Wetland Conservation at the International workshops "The Importance of the Black Sea Wetlands, Especially for for Migratory Waterbirds" and "Conservation, Restoration and Wise-Use of Wetlands Resources along the Black Sea Coast", held in February and September, 2000 in Odessa, Ukraine.

With the aim of restoring populations of marine mammals the following have taken place:

(1) A ban on the hunting of marine mammals, enforced by all Black Sea states;
(2) Regular population assessments of marine mammals are being conducted
(3) The Centre for the Conservation of Biological Diversity in Batumi, Georgia, has been provided with the necessary equipment in order to function as a regional rehabilitation centre for captive marine mammals;
(4) National centres and sanctuaries for the rehabilitation of marine mammals have been strengthened; and
(5) Consideration shall be given to modify fishing practices in order to avoid catching marine mammals, as by-catch, during normal operations and to develop a strategy for the reduction of by-catches of marine mammals.

For further information refer to:

Wetlands International Black Sea Programme. Edited by Sunay Demircan, Gennadiy Marushevsky, Rob van Westrienen, Vasiliy Kostyushin
Directory of Azov-Black Sea Wetlands. Edited by Gennadiy Marushevsky

2.5.5 Alien Species Introduction

Black Sea states will present a joint proposal to the IMO, for conducting an in-depth study on measures to avoid any further introductions of exotic species into the Black Sea through the deballasting of vessels. Given the danger of such species migrating to other seas in the region, the coastal states of the Caspian and Mediterranean Seas will be consulted (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

2.5.6 Environmental Impact Assessment

By 1998, all Black Sea coastal states will adopt criteria for environmental impact assessments and environmental audits that will be compulsory for all public and private projects. The coastal states will cooperate to harmonize these criteria by 1999 and where possible, to introduce strategic environmental assessments (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

2.5.7 Integrated Coastal Zone Management

In order to ensure proper management of the coastal zone, coordinated Integrated Coastal Zone Management (ICZM) strategies are being developed for the Black Sea region. A Regional Black Sea Strategy for ICZM is being developed upon the recommendations of its Advisory Group on the Development of Common Methodologies for ICZM. The regional strategy elaborates basic principles and methodologies for land and water use planning as well as for designing zoning systems. The methodologies and principles recommended in the regional strategy shall be taken into account when developing or reviewing national strategies and planning instruments for ICZM. In addition each Black Sea coastal state will adopt and implement, in accordance with its own legal system, the legal and other instruments required to facilitate ICZM (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

Inter-sectoral committees for ICZM are being established at the national, regional and local levels of public administration that will design and implement national plans for ICZM through participatory approaches. A survey of coastal erosion problems in the region will be conducted. The survey will address the magnitude of the problem, including its economic implications; propose remedial actions, and include suggestions for pilot studies and demonstration projects (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

2.5.8 Development of Sustainable Aquaculture and Tourism

Aquaculture and tourism are two areas considered to have scope for economic growth in the Black Sea and to benefit the region in general. In order to avoid environmental damage resulting from these activities, and particularly damage with transboundary implications. Sustainable aquaculture is being stimulated through the conduct of feasibility studies. In parallel with the development of legislation enabling the regulation of aquaculture. Such legislation should ensure that aquaculture itself does not present a threat to the environment and should address issues, such as, the

location and density of cages, releases of commercial strains, imports and releases of exotic species, quarantining and matters of hygiene. Moreover, aquaculture projects will be subjected to Environmental Impact Assessments (EIA) in which the potential effect of the activity upon biological diversity are given careful consideration.

Eco-tourism is being stimulated in the region through the implementation of pilot projects in Black Sea coastal states. In close cooperation with the tourist industry and the national tourism authorities, environmental codes of conduct and training courses in sustainable tourism are being developed. The tourism industry, both for the benefit of the industry and for the benefit of the environment, needs to be more adequately planned with a view to incorporating concerns such as those related to water supply, sewage treatment bathing water quality, the use of natural resources and resort development into newly developed projects from the beginning. Moreover, it shall be required that tourist development projects be subjected to EIAs (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

2.5.9 Public Involvement

Participation of all sectors of society is an essential requirement for the development of sustainable policies in the region. It requires the development of education projects, transparent and participatory decision making procedures and open rules on access to administrative and judicial procedures.

Municipalities will be closely involved in the implementation of this Strategic Action Plan, such as the International Black Sea Club of Cities. Black Sea municipalities will also be stimulated to cooperate at the national level and with municipalities in other countries and regions. The Union of Governors of the BSEC will also be requested to cooperate towards the implementation of this Strategic Action Plan.

NGOs and the Black Sea NGO Forum will be closely involved in the development and implementation of both national and regional policies aimed at rehabilitating and protecting the Black Sea ecosystem and the sustainable use of its natural resources.

Stakeholders will be involvemed in the decision making process and their responsibilities in implementing this Strategic Action Plan defined, through mechanisms such as those provided by new Regional Environmental Centres.

Each Black Sea state adopted and implemented rules which guarantee the right of access to environmental information, which provide for the right of the public and NGOs to participate in decision making, and which provide for the right of individuals and groups to appeal to administrative and judicial organs.

Information about the actions taken to rehabilitate and protect the Black Sea ecosystem will be widely disseminated as well as; an educational information package for use in schools; a mobile exhibition will be prepared and translated into the languages of the Black Sea states for display at public functions and educational establishments; and a user-friendly Black Sea CD ROM multimedia information package, based upon the existing GIS system.

Based on harmonised criteria, information on the state of bathing water suitable for advising the public on the potential risks to their health shall be made widely available to the public during the active tourist season. Frequency of sampling and analytical methodology should be sufficient to inform bathers of conditions, which may pose health risks. Additionally, a colour coding system for bathing water quality

maps shall be developed and such maps shall be published annually (Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, 1996).

3 Publications

Link to a comprehensive list of recent publications from the Black Sea Environmental Programme and a list of project publications from NATO TU-Black Sea Projects http://www.blackseaweb.net/publications/welcome.html

Implementation of the Strategic Action Plan for the Rehabilitation and Protection of the Black Sea: 1996-2001. A Report By the Commission on the Protection of the Black Sea Against Pollution. Istanbul, Turkey, 2002 and Implementation of the Black Sea Strategic Action Plan Report 1996 - 2000 Annexes link to http://www.blacksea-commission.org/main.htm.

UNEP-GEF Black Sea Ecosystem Recovery Project. Project Implementation Plan. Phase 1 (2002-2004) Downloadable at http://www.gpa.unep.org/meetings/black_sea/Background%20documents/BSERP_Implementation_Plan.pdf.

GEF, 1996. Strategic Action Plan for the Rehabilitation and Protection of the Black Sea. 29p.

GEF, 1997. Black Sea Transboundary Diagnostic Analysis. UNEP, New York, 142 pages.

3.1 Regional Seas Reports and Studies

Link to the Regional Seas Reports and Studies no the main homepage.

3.2 Website Links

Commission for the Protection of the Black Sea Against Pollution http://www.blacksea-commission.org/main.htm.
Black Sea NGO Network http://www.bseanetwork.org.
Black Sea Project http://sfp1.ims.metu.edu.tr/. Black Sea Ecosystem Processes and forecasting /operational database management system
Black Sea Ecosystem Recovery Project Homepage http://www.blacksea-environment.org/text/default.htm
Black Sea Large Marine Ecosystem http://na.nefsc.noaa.gov/lme/text/lme62.htm
Black Sea Web http://www.blackseaweb.net/
Black Sea Media Club http://www.media-club.iatp.org.ua/index.htm.
Black Sea Regional Energy Centre http://www.bsrec.bg.
Black Sea Environmental Internet Node http://www.grid.unep.ch/bsein/
The Black Sea Pages http://blacksea.free.fr/
Black Sea Economic Cooperation http://www.bsec-organization.org/
The Black Sea and Caspian Sea Environmental Information Centre http://pims.ed.ornl.gov/
Black Sea Trade and Development Bank http://www.bstdb.org/
Black Sea University Foundation http://www.bsufonline.org/.
State Energy Regulatory Commission in Bulgaria http://www.dker.bg/index_en.htm
Ministry of Energy and Energy of Resources in Bulgaria http://www.doe.bg/cgi-bin/i.pl**.** (in national language)
Energy Efficiency Agency in Bulgaria http://www.seea.government.bg/index.jsp (in national language)
Parliament of Georgia http://www.parliament.ge

Republic of Bulgaria National Assembly http://www.parliament.bg/?lng=en
Grand National Assembly of Turkey http://www.allaboutturkey.com/tbmm.htm
Parliament of Romania http://www.cdep.ro/pls/dic/site.page?id=103&idl=2
Parliament of the Russian Federation (in Russian) http://www.duma.ru/
Government Portal of Ukraine http://www.kmu.gov.ua/control/en
ICPDR (International Commission for the Protection of the Danube River) http://www.icpdr.org/pls/danubis/danubis_db.dyn_navigator.show.
ACCOBAMS (Agreement on the Conservation of Cetaceans of the Black Sea and Mediterranean Sea). http://www.accobams.org/ceta_medblacksea.htm

3.3 Newsletter

Saving The Black Sea
The official Newsletter of the Black Sea Environmental Programme
Link to copies:
http://www.blacksea-commission.org/Publications/SavingTheBS/01/index.htm.
Black Sea Regional Energy Centre
Downloadable copies link to: http://www.bsrec.bg.
Black Sea Shared
Regional environmental NGO newsletter for the Black Sea link to:
http://www.bseanetwork.org/newsletter.html.

4 Calendar of Events

To link to the Calendar for the Black Sea Commission Link to http://www.blacksea-environment.org/

5 List of Institutions

A comprehensive list of institutions in each member state is available in downloadable format at the link: http://www.bseanetwork.org/directories.html.

6 References

Black Sea Commission (2004) http://www.blacksea-environment.org/ (Accessed 2/6/04)
UNEP (2002) RER/01/G33/A/1G/31 Control of eutrophictation, hazardous substances and related measure for rehabilitating the Black sea Ecosystem: Tranche 2. April 2004
UNEP (2001) Ecosystem-based Management of Fisheries. Opportunities and challenges for coordination between marine Regional Fishery Bodies and Regional Seas Conventions. UNEP Regional Seas Reports and Studies No.175.
Strategic Action Plan for the Rehabilitation and Protection of the Black Sea (1996) http://www.blacksea-environment.org/ (Accessed 2/6/04)
State of the Environment of the Black Sea (2002) Pressures and Trends 1996-2000. Istanbul 2002
Regional Seas (2003) Status Reports on the Regional Seas. Unpublished. UNEP/Regional Seas Programme/2003
Black Sea (2004) Large Marine Ecosystem #62: Black Sea http://na.nefsc.noaa.gov/lme/text/lme62.htm (accessed 8/6/04)
CIA (2003) Central Intelligence Agency. World Fact Book (Accessed 11/06/04) http://www.cia.gov/cia/publications/factbook/.
World Bank (2002) World Bank Data Query http://devdata.worldbank.org/data-query/. (Accessed 11/06/04)
Milchakova, N.A. (1998) Seagrasses of the Black Sea.. Frontiers in Seagrass Research: A challenge of the New Millenium. 3rd International Seagrass Biology Workshop. Book of Abstracts. Philipines, 19-26 April 1998, - p.44
The Ramsar List of Wetlands of International Importance (2004) http://www.ramsar.org/sitelist.doc. (Accessed 11/06/04)
Black Sea NGO Network (2004) Commitment to the Black Sea http://www.bseanetwork.org/blacksea.html. (Accessed 11/06/04)
Zaitsev. Yu.P, Alexandrov B.G, Berlinsky N.A. (2004) European Environment Agency Europe's biodiversity - biogeographical regions and seas. Seas around Europe. The Black Sea. *Institute of Biology of the Southern Seas (IBSS)* A. Zenetos, National Centre for Marine Research, Greece (NCMR) (Accessed 15/06/04) http://reports.eea.eu.int/report_2002_0524_154909/en/BlackSea.pdf