The Commission on the Protection of the Black Sea Against Pollution

Permanent Secretariat

Strategic Action Plan for the Environmental Protection and Rehabilitation of the Black Sea

Adopted in Sofia, Bulgaria, 17 April 2009

Preamble

Desiring to rehabilitate and protect the Black Sea, the Governments of:

Bulgaria
Georgia
Romania
The Russian Federation
Turkey, and
Ukraine

Recalling the provisions and the principles of the Convention on the Protection of the Black Sea Against Pollution, together with its constituent Protocols, signed in Bucharest on 21 April 1992;

Also **recalling** that the preparation of the strategic action plan was called for in Resolution 3, adopted at the Diplomatic Conference on the Protection of the Black Sea, Bucharest, April 21-22, 1992;

Noting also the Declaration on the Protection of the Black Sea signed in Odessa on 7 April 1993 and the Declaration on the Protection of the Black Sea signed in Sofia on 14 June 2002;

Appreciating that progress has been made towards attaining sustainable development in the Black Sea region through, amongst other things, the actions taken within the Black Sea Environmental Project (BSEP) and the Black Sea Ecosystem Recovery Project (BSERP) and other interventions supported implementation of the Bucharest Convention and the Strategic Action Plan for the Rehabilitation and Protection of the Black Sea, signed in Istanbul on 31 October 1996, amended 2002;

Reiterating that conservation, protection of biodiversity and habitats, reduction of eutrophication, increasing environmental safety aspects of shipping and other improvements in water quality are primary areas for transboundary cooperation;

Wishing to continue in the spirit of shared responsibility and strong cooperation, inter alia, with other Black Sea basin countries;

Reaffirming our commitment to the environmental protection and sustainable management of the Black Sea;

Approves the principles, policies and actions as expressed in the following Strategic Action Plan for Environmental Protection and Rehabilitation of the Black Sea.

1.Introduction

This document represents an agreement between the six Black Sea Coastal states (Bulgaria, Georgia, Romania, the Russian Federation, Turkey and Ukraine) to act in concert to assist in the continued recovery of the Black Sea. The document provides a brief overview of the current status of the Sea, based largely on information contained within the 2007 Black Sea Transboundary Diagnostic Analysis (BS TDA), and taking into account progress with achieving the aims of the original (1996) Black Sea Strategic Action Plan (BS SAP). This SAP builds upon BS SAP signed in 1996 (updated in 2002), by reorganising the priorities and actions therein considering the progress in the region and the current state of the environment.

This updated (2009) version of the BS SAP describes the policy actions required to meet the major environmental challenges now facing the Sea, and includes a series of management targets.

1.1 The Black Sea

The Black Sea is one of the most remarkable regional seas in the world. It is almost cut off from the rest of the world's seas, is over 2200 m deep and receives the drainage from a 1.9 million km2 basin covering about one third of the area of continental Europe. Its only connection to the world's oceans is through the Istanbul Strait, a 35 km natural channel, as little as 40 m deep in places. This channel has a two layer flow, carrying about 300 km3 of seawater to the Black Sea from the Mediterranean along the bottom layer and returning a mixture of seawater and freshwater with twice this volume in the upper layer.

Every year, about 350 km3 of river water enters the Black Sea from land in over twenty countries: Albania, Austria, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Georgia, Germany, Hungary, Italy, Macedonia, Moldova, Montenegro, Poland, Romania, the Russian Federation, Serbia, Slovakia, Slovenia, Switzerland, Turkey and Ukraine. Europe's second, third, fourth and sixth largest rivers the Danube, Dnipro, Don (indirectly via the Sea of Azov) and Dniester all flow to the Black Sea.

1.2 The need for and purpose of the updated SAP (in relation to the 1996 BS SAP, amended 2002)

The signing of the Convention on the Protection of the Black Sea Against Pollution (Bucharest Convention) in 1992, followed closely by the first Black Sea Ministerial Declaration (the Odessa Declaration) in 1993 inspired the GEF, to support the region in implementing the Odessa Declaration and to formulate the longer-term Black Sea Strategic Action Plan (BS SAP).

Following the signature of the BS SAP, GEF funding was sustained in order to enable countries to complete National Black Sea Strategic Action Plans and for the negotiations on the institutionalisation of the Istanbul Commission's Secretariat to be completed. Progress was made in implementation of existing BSSAP, with the GEF, EC and other donors' assistance. In October 2000, the Secretariat for the Black Sea Commission became operational.

The 1996 BS SAP was a groundbreaking document for the Black Sea region which established specific targets and timetables for implementing the objectives of the 1992 Bucharest Convention. However, it was an overly ambitious document and very few of the targets were accomplished on time. Furthermore, the 1996 BS SAP also suffered from problems of enforcement of national environmental laws and legislation, and the lack of a regional mechanism to ensure compliance with different policy actions . An amendment in 2002 (the 2002 Sofia Ministerial Declaration) aimed to resolve some of these issues and reconfirm commitments of the Black Sea coastal states to implement the BS SAP.

The 2009 BS SAP has been formulated through careful consideration of *inter alia* the 1996 SAP, the 2007 BS TDA and the 2007 BS SAP Gap Analysis. It aims to help resolve the transboundary environmental problems of the Black Sea and is a joint effort between the six Black Sea countries. The SAP was elaborated from consensus reached at a multinational level in relation to a series of proposals that include: Ecosystem Quality Objectives (EcoQOs); short, medium and long term targets; and legal and institutional reforms and investments necessary to solve main environmental problems identified within the 2007 BS TDA. The process of elaboration of the SAP was characterized by the participation and commitment of the main social stakeholders and key institutions of the Black Sea countries.

1.3Black Sea regional cooperation framework

The Black Sea Commission is the regional cooperation framework, made up of with one member from each of the six national governments. The Black Sea coastal states entrusted a coordinating role for the implementation of the BSASP to the Black Sea Commission

supported in its activity for implementation of the work program of the Black Sea Commission by its Permanent Secretariat.

In order to achieve, the purposes of this SAP, the Commission will cooperate with competent international organisations, especially with a view to developing appropriate programs or obtaining assistance.

1.4 The geographic scope of the SAP

The geographical scope of the Convention on the Protection of the Black Sea against Pollution is applied to the Black Sea proper, with the Southern boundary constituted, for the purposes of this Convention, by a line running between Capes Kelagra and Dalyan. In addition the SAP will cover pollution sources from coastal area. In addition, Black Sea coastal states shall make effort to implement relevant provisions of the SAP at the Black Sea basin level.

1.5 The basis for cooperative action

The Black Sea coastal States share a common desire for the sustainable management of the natural resources and biodiversity of the Black Sea and recognize their role and responsibility in conserving the global value of these resources. The states have considered and taken into account, where appropriate, the following principles and values when developing this document.

1 5.1. The principle of **sustainability** shall be applied such that there is a prudent and rational utilization of living resources and the preservation of the rights of future generations to a viable environment.

1.5.2. The **precautionary principle** shall be applied, such that measures shall be taken when there are reasonable grounds for concern that any activity may increase the potential hazards to human health, harm living resources or ecosystems, damage amenities, or interfere with other legitimate uses of the Black Sea, even when there is no conclusive evidence of a causal relationship between the activity and the effects; and by virtue of which, greater caution is required when information, including scientific information, is uncertain, unreliable or inadequate.

1.5.3. The **polluter pays principle** shall be applied, such that the cost of preventing and eliminating pollution, including clean-up costs, shall be paid by the polluter.

1.5.4. The principle of **anticipatory action** shall be applied, such that contingency planning, environmental impact assessment and strategic impact assessment (involving the assessment of the environmental and social consequences of governmental policies, programmes and plans) shall be undertaken in the future development in the region.

1.5.5. The principle of **preventative action** shall be applied, such that timely action shall be taken to alert the responsible and relevant authorities of likely impacts and to address the actual or potential causes of adverse impacts on the environment, before they occur.

1.5.6. Environmental and health considerations shall be included into all relevant policies and sectoral plans and programmes, including, *inter alia*, urban planning, industrial development, fisheries, aquaculture and tourism.

1.5.7. Use of **clean technology** shall be promoted when replacing or phasing-out high waste and waste-generating technologies, including the use of BAT and BEP.

1.5.8. Use of **Sustainable Agriculture** including the use of Good Agricultural Practices (GAP) shall be promoted in order to replace or phase-out unsustainable agricultural practices.

1.5.9. Development planning and environmental planning processes should be integrated to the maximum extent. The use of **economic instruments** that foster sustainable development shall be promoted through, *inter alia*, the implementation of economic incentives for introducing environmentally friendly technologies, activities and practices; the phasing-out of subsidies which encourage the continuation of non-environmentally friendly technologies, activities and practices; and the introduction of user fees.

1.5.10. The principle of **accessibility of information** shall be applied, such that information on the pollution of the environment of the Black Sea held by a littoral state shall be provided by that state to all littoral states, where relevant and in the maximum possible amount.

1.5.11. The principles of **public participation and transparency** shall be applied, such that all stakeholders, including communities, individuals and concerned organizations shall be given the opportunity to participate, at the appropriate level, in decision-making and management processes that affect the Black Sea. This includes providing access to information concerning the environment that is held by public authorities, together with effective access to judicial and administrative proceedings to enable all stakeholders to exercise their rights effectively. Public authorities shall widely disseminate information on the work proposed and undertaken to monitor, protect and improve the state of Black Sea.

1.6 Vision for the Black Sea

The vision for the Black Sea is to preserve its ecosystem as a valuable natural endowment of the region, whilst ensuring the protection of its marine and coastal living resources as a condition for sustainable development of the Black Sea coastal states, well-being, health and security of their population.

2. The Challenge

The Black Sea TDA-2007 reconfirmed four priority transboundary problems expressed in the BS SAP 1996, amended 2002. These are: eutrophication/nutrient enrichment; changes in marine living resources; chemical pollution (including oil); and biodiversity/habitat changes,

including alien species introduction. The identified priorities are outlined below, together with the hotspots, and legal and institutional analyses.

2.1 Eutrophication/nutrient-enrichment

This decrease in the importance of agriculture as an economic powerhouse of the region has been clearly shown by decreasing trends in livestock numbers and a shift from major livestock farms to smaller-scale or subsistence-level farming. Livestock numbers (excluding poultry) in 2004 were about two-thirds of those present 1997, and about one-third of the numbers recorded in 1998. Inorganic fertiliser application rates also appear to have fallen substantially, with large areas of land (in some countries at least) left fallow. However, indicators suggest that this decline in agricultural productivity may have bottomed-out, so a gradual re-intensification of agricultural practices may begin in the near future.

Direct discharges from large municipal/industrial plants to the Sea are equivalent to only small proportion of nutrients discharged to the Sea via rivers, of which the Danube is by far the most important. Available information also suggests that atmospheric deposition of nitrogen to the Sea may be of a similar order of magnitude to river loads, but there is considerable uncertainty over the data used, with a clear need for updating and harmonisation of monitoring protocols.

Based on the data reported by the Black Sea coastal states and the results presented in the 2007 Black Sea TDA, it is suggested that more than 80% of the river-borne inorganic nitrogen load and around 50% of the river-borne phosphate load enters the Sea from the Danube. However, the Danube has by far the most rigorous nutrient loads monitoring programme of all rivers, and it is likely that nutrient loads from other rivers are under-estimated by comparison. The importance of freshwater nutrient inflows to the Sea of Azov could not be estimated because of a lack of data for the Kerch Strait.

Between 1996 and 2005 there has been no evidence of a change in river-borne DIN loads to the Sea, albeit with a moderate (15%) decrease in river-borne PO4-P loads over the same period. However, the level of confidence associated with the PO4-P load decrease is very low, due to the large inter-annual variability.

Considering that the Danube is such a major pathway of nutrient input to the Black Sea and that phosphorus emissions to the Danube are estimated to have fallen by approaching 50% between 1990 and 2000, and nitrogen emissions by about 20% between 1985 and 2000, this may appear to be disappointing. However, reductions in nutrient loads/concentrations in the upper and middle reaches of the Danube have been observed since 2000, and these improvements are expected to continue downstream in future years.

2.2 Commercial marine living resources

Due to over fishing in the early 1970s-1980s, the structure of catches has shifted significantly. Declining stocks of predatory species such as bonito, horse mackerel and bluefish resulted in an increase in non-predatory species such as anchovy and sprat. Consequently, fishing fleets have increasingly targeted these smaller species, resulting in increased by-catches of larger, less abundant fish species. Total fish landings are now about half of what they were in the latter half of the 1980s.

Commercially important marine living resources have been greatly affected by alien species introductions, eutrophication, over-fishing and habitats change/damage. Annual total fish catch statistics show an improving situation, but these figures are dominated by catches of anchovy and sprat. There have been recent improvements in catches of some other fish, such as bonito, but turbot, dogfish and whiting catches have either shown no improvement or have fallen over the past decade-or-so. Sturgeons remain endangered. Unsustainable fishing practices are still in relatively common use.

The importance of *Rapana*, the Japanese Snail has increased and has helped to off-set the decline in mussel and clam landings (the decline being due, in large part, to predation by *Rapana* anyway).

The contribution of illegal fishing activities to damage/change of marine living resources is not clearly understood, but there a general acceptance that this is a causative factor.

The seafood industry is a major coastal employer, particularly for some countries. Aquaculture is not strongly developed in the region and there is scope for this to be expanded, providing environmental considerations are taken into account.

2.3 Chemical pollution

An assessment of pollutant loads from river and large direct municipal/industrial discharges was made. However, the pollution loads data are very incomplete, BOD5 being the only parameter (apart from nutrients) that is routinely monitored from major point sources and rivers. Relatively high contamination levels of some pesticides, heavy metals and PCBs are present at specific sites in the Black Sea, with illegal dumping/discharges (particularly of agrochemicals) being recognised as a particular problem. The historically poor enforcement of discharge standards and a failure to consider the Sea itself as a receiving water body for discharges to river are considered to be the principal reasons underlying the pollution status of the Sea.

A huge increase in the volume of oil being transported across the Black Sea and oil/gas extraction from beneath the Sea itself have greatly increased the risk of oil pollution. This presents two types of problem: (i) localised chronic pollution stemming from frequent but minor releases of oil; and (ii) acute pollution resulting from major oils spills. Remote sensing data show that the majority of oil spills occur along major shipping routes, suggesting that shipping, rather than land-based oil installations have been the principal cause of concern. However, a single large spill from ships, platforms or land-based oil installations could severely impact biota and the economies of all coastal countries.

2.4 Biodiversity

Formerly “dead” areas of the NW Shelf bed are once again colonised by biota, with evidence of biodiversity continuing to increase. The once massive area dominated by Zernov’s *Phyllophora* (a red seaweed) field has decreased hugely in area over the last few decades, having been replaced by other, opportunistic macroalgae. However, there are encouraging signs that in recent years this decline has either slowed down and recovery may actually be beginning at some sites. However, during the last two decades, the area covered by eelgrass (*Zostera*) has decreased tenfold in shallow waters.

Further, all coastal margin habitats are considered to be in a critical status in at least one country; both types of pelagic habitat (neritic and open sea) are considered critical in at least one country; and 13 of 37 types of benthic habitat are considered to be critical in at least one country. Those habitats most at risk include the neritic water column, coastal lagoons, estuaries/deltas and wetlands/saltmarshes.

The invasion of *Mnemiopsis leidyi* (a comb jelly) contributed to a catastrophic decline in fish productivity in the late 1980s/early 1990s. The subsequent invasion of another comb jelly (*Beroe ovata*), which feeds on the original invader, means that opinions are now split as to whether *Mnemiopsis* still has a major impact on fish communities and catches.

Between 1996 and 2005 a total of 48 new alien species were recorded, which represents over 22 % of all registered aliens. The majority belong to phytoplankton (16) and zoobenthos (15), followed by zooplankton (8), fish (5), macroalgae (3) and mammals (1). This increase in invasive aliens suggests a serious impact on the Black Sea native biological diversity, with negative consequences for human activities and economic interests.

2.5 Causal chain analyses

Many of the immediate, underlying and root causes of individual transboundary problems are shared with other problems. In particular, the causal chain analyses for nutrient enrichment and chemical pollution are very similar, since the majority of sources of chemical pollution are also sources of nutrients. For biodiversity, the failure to adequately treat ship ballast water is regarded as being an important cause of the problem, and for changes in commercial marine living resources the other three transboundary problems are clearly contributory factors.

It is clear, therefore that the four transboundary problems cannot be dealt with individually. Improvements in management of one problem will have knock-on effects for other problems, and addressing individual causes is likely to improve the situation with regard to at least two, if not more, of the four transboundary problems. For example, one of the causes of all four of the environmental problems is that of poorly regulated coastal development. The six coastal countries all agree with the ‘ecology tenet’ underlying integrated coastal zone management, i.e. that coastal development should take account of marine ecology, conservation and biodiversity, but the underlying institutional structures vary considerably between countries. There are many examples where money has spoken louder than words.

2.6 Hot-spots analysis

A review of planned and proposed capital investments on pollution point sources identified from the 1996 TDA has shown disappointing results. Of the 50 investments initially identified, only 12 have been completed and 2 are no longer required. A decade later, work is in progress on another 10 point sources, but over half of the capital investments originally identified have either been insufficiently funded or not funded at all. Capital investment costs to address the identified 50 hot-spots were originally estimated to be almost $400 million. By the end of 2005 at least $143 million had been spent on addressing these point sources, with a further $340 million planned to be spent by the end of 2015.

2.7 Legal and institutional analysis

National environmental legislation is relatively strong, but the enforcement of this legislation has been less robust. The division of responsibilities for environmental monitoring and protection between different ministries and intra-ministerial organizations is sometimes over-complex and could be simplified in some countries at least.

In Bulgaria and Romania, EU Accession and membership has been good news for the environment. Turkey is in the initial stages of its EU accession negotiations and is keen to fund the capital investments and adopt the best agricultural practice regulations required, so further environmental improvements should accrue in the future. However, there is a need for improved cooperation between the Environment and other Ministries in all countries.

3. Policy Actions

Following the provisions of the Odessa Declaration 1993 and invitation of the Black Sea coastal states the Black Sea Environmental Programme (BSEP) was launched in June 1993. The Programme included a number of interventions by the GEF, including the development of the first Black Sea Transboundary Diagnostic Analysis (TDA), finalised in June 1996. On the basis of this comprehensive report senior government officials negotiated the Black Sea Strategic Action Plan (BS SAP), signed on October 31st 1996 at a Ministerial Conference in Istanbul, amended on June 14, 2002 in Sofia.

An updated Transboundary Diagnostic Analysis 2007 was carried out on the request of the Black Sea Commission with continued support by GEF and EC. Combined efforts have resulted in an assessment of the work undertaken in meeting the aims of the BS SAP 1996, together with the delivery of an updated (2007) TDA. These documents include contributions from and the opinions of some 60 Black Sea regional experts.

3.1 Key management approaches

The 2007 Black Sea SAP will adhere to 3 key environmental management approaches. These are:

- Integrated Coastal Zone Management (ICZM);
- The Ecosystem Approach; and
- Integrated River Basin Management (IRBM)

A description of each approach is outlined in the Glossary of Terms (Annex 3).

3.2 Long-term Ecosystem Quality Objectives (EcoQOs)

The Ecosystem Quality Objectives (EcoQOs) are statements regarding the Vision that reflect how stakeholders would like the state of the Black Sea to be over the long term, based on a resolution of priority problems identified in the Transboundary Diagnostic Analysis.

The TDA 2007 reconfirmed four priority transboundary environmental problems, described above, requiring coordinated efforts by all Black Sea coastal States. It was determined that these areas of concern, and their causes, could be most effectively and appropriately addressed through the aims of four Ecosystem Quality Objectives (EcoQOs). The four EcoQOs and associated Sub EcoQOs are:

EcoQO 1: Preserve commercial marine living resources.
EcoQO 1a: Sustainable use of commercial fish stocks and other marine living resources.
EcoQO 1b: Restore/rehabilitate stocks of commercial marine living resources.

EcoQO 2: Conservation of Black Sea Biodiversity and Habitats.

EcoQO 2a: Reduce the risk of extinction of threatened species.
EcoQO 2b: Conserve coastal and marine habitats and landscapes.
EcoQO 2c: Reduce and manage human mediated species introductions

EcoQO 3: Reduce eutrophication.

EcoQO 4: Ensure Good Water Quality for Human Health, Recreational Use and Aquatic Biota.

EcoQO 4a: Reduce pollutants originating from land based sources, including atmospheric emissions.
EcoQO 4b: Reduce pollutants originating from shipping activities and offshore installations

3.3 Management targets and priority status required to meet the EcoQOs

Each EcoQO is assigned a number of management targets that address the immediate, underlying and root causes of the concern areas. For regional level interventions, the Black Sea coastal States and the international partners shall work collectively to take the required steps to fulfill those interventions. National level supporting interventions will be the responsibility of individual states.

Management targets are shown in the table below. The timings of the interventions in order to meet these targets are also listed (short-term = 1-5 years, mid-term = >5-10 years and long-term = >10 years), as is the perceived relative importance of individual interventions. Further details on each EcoQO, including targets, outputs, time to implement, legal, institutional and policy reforms required, indicators of success and uncertainties are presented in a series of matrices in Annex 1.

Reference (Annex 3)	Overall target	Short-term target	Mid-term target	Long-term target	Priority
(1)	Adopt and implement a Regional Agreement for fisheries and conservation of living resources of the Black Sea.	✓	✓		High

(10)	Develop and introduce methodologies to assess the condition of populations of commercial marine living resources.	✓	✓		Medium
(11)	Finalise, adopt and implement the regional SAP for Black Sea Biodiversity and undertake 5 yearly regional update of the list of conservation status of threatened coastal and marine species as well as list of critical habitats for these species.	✓	✓	✓	High / Medium
(12)	All six BS countries adopt and implement a regional Conservation Plan for Black Sea endangered species and develop national action plans.		✓		Medium
(13)	Assess impacts of climate change on Black Sea ecosystem and sustainable development of the coastal population	✓			Medium/ Low
(14)	Consider the necessity of creation of new and/or expansion of existing protected areas, including transboundary areas in consultation with the relevant Black Sea countries with particular attention to marine protected areas. Establish or extend these areas where necessary.	✓	✓		High
(15)	Further recognise and implement integrated coastal zone management principles.	✓		✓	High / Medium
(16)	Develop and disseminate information, training and education materials on ICZM in regional languages, referring to coastal and marine biodiversity conservation.	✓	✓		Medium
(17)	Regionally converge on Environmental Impact Assessment and Strategic Environmental Assessment procedures.	✓	✓		Medium
(18)	Amend national waste strategies and/or national coastal zone management plans with the aim of coastal and marine litter minimisation.	✓	✓		Medium
(19)	Develop regional and national marine litter monitoring and assessment methodologies on the basis of common research approaches, evaluation criteria and reporting requirements.	✓	✓		Medium
(20)	Promote/develop investment projects within national strategies/local plans to engineer, construct and install new solid waste recycling facilities, landfill sites	✓	✓	✓	Medium

	and incineration plants, complying with BAT regulations.				
(21)	Monitor and facilitate the progress in the implementation of nationally developed management plans of the protected areas.	✓	✓		High / Medium
(22)	Develop an inventory, classification and a mapping system for BS habitats.	✓	✓		High / Medium
(23)	Identify and make an inventory of Black Sea landscapes of high natural, historical, cultural and aesthetic value.	✓	✓		Medium
(24)	Undertake preliminary regional assessment of coastal erosion.	✓			Low
(25)	Support coordinated scientific studies, increase resources to marine science and improve capacity particularly through targeted training programmes supporting scientific projects/programmes.	✓			High / Medium
(26)	Promote cooperation in the Black Sea in line with principles and recommendations of the International Convention for the Control and Management of Ships' Ballast Water and Sediments.	✓			High
(27)	Harmonise ballast water procedures using IMO guidelines.	✓			High
(28)	Identify actions towards ratification of the BWM Convention in the BS region.	✓	✓		High
(29)	Implement integrated river basin management and integrated coastal zone management approaches, as stated in revised LBSA protocol.	✓	✓	✓	High
(30)	Introduce cost efficiency approach to nutrient management in all BS countries.		✓		Medium
(31)	Upgrade all WWTPs serving populations > 200,000 p.e. within the BS countries sub-basins to include N&P removal.	✓	✓	✓	High / Medium
(32)	Ensure all tourist resorts are connected to sewerage systems with WWTPs of adequate capacity to address seasonal loads.	✓		✓	High / Medium
(33)	Ensure that all industrial plants have adequate wastewater treatment to reduce N&P emissions from direct discharge to surface waters.	✓		✓	High / Medium
(34)	Reduce or phase out the use of high P-		✓	✓	High

	containing laundry detergents.				
(35)	Introduce harmonised P and N standards for all WWTPs serving >100,000 p.e. Ensure compliance with and harmonise standards at regional level.	✓		✓	Medium
(36)	Reduce atmospheric emissions of N from municipal, agricultural and industrial sources, though the introduction of BAT, BAP principles etc.			✓	High / Medium
(37)	Harmonise the monitoring and assessment of N & P (concentrations and loads) in major rivers and straits.	✓	✓		High
(38)	Improve network of atmospheric deposition monitoring stations around the Black Sea coast.		✓	✓	Medium
(39)	Develop a nutrient modelling tool to enable source apportionment estimates to be made.	✓	✓		Medium
(40)	Improve the use of regulatory instruments for reducing point and diffuse source pollution from agriculture.		✓	✓	High
(41)	Where financial resources are available and to the greatest possible extent, introduce appropriate economic incentives to reduce nutrient emissions from agriculture.		✓	✓	High / Medium
(42)	Develop and expand the capacity of national agricultural extension services for promoting the control of agricultural pollution.		✓		High
(43)		✓	✓		Medium
(44)	Develop/define BAT for the design and operation of large-scale agro-industrial livestock production units, including pig and poultry farms with no land.	✓	✓		High / Medium
(45)	All BS states agree to implement provisions of the LBSA Protocol to the BS Convention.	✓			High
(46)	Strengthen enforcement of national/regional and international regulations on land–based pollution sources.		✓		High / Medium
(47)	Develop economic incentive mechanisms for chemical pollution control.		✓		High / Medium
(48)	Introduce and disseminate the concept of BAT and BEP as a tool for	✓	✓		High

	encouraging farmers to deliver the highest level of on-farm pollution control.				
(49)	Introduce BAT and BEP for the most polluting industries and activities in all BS countries.		✓	✓	High / Medium
(50)	Harmonise environmental quality standards throughout the Black Sea region and elaborate regionally agreed criteria for assessment of the state of the Black Sea environment.	✓	✓		High
(51)	Develop/improve the existing monitoring system to provide comparable data sets for pollutant loads (from direct discharges and river inputs) and for other parameters.	✓			High
(52)	Improve the "List of Black Sea-specific priority pollutants" to help target monitoring priorities.	✓			High / Medium
(53)	Continue/improve rehabilitation /construction and monitoring of wastewater treatment plants.	✓	✓	✓	High / Medium
(54)	Optimise and/or increase resources to regulatory and enforcement bodies responsible for pollution control and improve capacity through targeted training programmes.	✓			High / Medium
(55)	Adopt the Black Sea Contingency Plan to the Protocol on Cooperation in Combating Pollution of the Black Sea by Oil and Other Harmful Substances in Emergency Situations (Part I – Response to oil pollution).	✓			High / Medium
(56)	Develop and adopt Part II (Chemical Plan) of the Black Sea Contingency Plan to the Protocol on Cooperation in Combating Pollution of the Black Sea by Oil and Other Harmful Substances in Emergency Situations.	✓	✓		High / Medium
(57)	Establish an inter-state ministerial mechanism to enable a quick response to major pollution events.		✓		High / Medium
(58)	Adopt and enforce relevant international legal instruments for safety navigation, pollution prevention, limitation of liability and compensation.	✓	✓		High / Medium
(59)	Improve regulations/ management of dredging / dumping activities.		✓		Medium
(60)	Provide adequate port reception	✓	✓		High /

	facilities for ship-generated wastes according to MARPOL 73/78, Annex I, IV, V.				Medium
(61)	Establish a harmonised fee/cost recovery system on ship-generated waste.	✓			High / Medium
(62)	Develop systems for the identification of illegal pollution sources from vessels and off-shore installations.		✓	✓	Medium
(63)	Develop/establish a harmonised enforcement system in cases of illegal discharges from vessels and off-shore installations, including technical means and fines.	✓			High / Medium
(64)	Develop a common system of claims management for pollution damages compensation.	✓			Medium
(65)	Assess the need to develop a legal framework for assessment of the transportation of hazardous wastes in line with Basel Convention.	✓	✓		High / Medium

In addition, having regard to the ecosystem approach, the following recommendations are made to competent authorities on fisheries management.

(2)	Harmonise and improve methodologies for the collation of fisheries statistic data and for assessment of the fish stocks at a regional level	✓	✓		High
(3)	Increase resources to regulatory bodies responsible for fisheries management	✓			Medium
(4)	Improved regionally-agreed system to match fishing effort to stocks		✓		High
(5)	Ban non–precautionary fishing technologies	✓	✓	✓	High/ Medium
(6)	Introduce instruments including management, economic and legal to ensure increased production from environmentally friendly mariculture to encourage a decrease in fishing effort.	✓			High / Medium
(7)	Develop regulations aimed at decreasing by-catch level	✓	✓		High / Medium
(8)	Elaborate and implement measures for increasing of the fish recruitment for the protection of juvenile commercial fish.	✓			Medium
(9)	Minimise ghost fishing caused by discarded, abandoned or lost fixed and floating nets, including those used in illegal/unregulated fishing activities		✓		Medium

3.4 Cross-cutting issues in the Black Sea

A number of cross-cutting issues in the Black Sea will also need to be addressed in order for the EcoQOs to be successfully achieved. These include:

- Capacity strengthening for enforcement (pollution, alien species, fisheries management)
- Improved public engagement (see Section 3.5)
- Strengthen the regional coordinating role of the Commission on the Protection of the Black Sea against Pollution (see Section 3.6)
- Climate change.

These issues have not necessarily been dealt with by inclusion as Management Targets under all of the Ecological Quality Objectives (Section 3.3).

Stakeholder involvement (improved public engagement) is seen as being particularly important in addressing agriculture-derived pollution (POPs and nutrients), fishing activities and the introduction/acceptance of the BAT and BEP principle by industry representatives.

The Causal Chain Analyses in the 2007 Black Sea TDA found climate change to be a contributory factor to all four transboundary problems, but not an immediate or underlying cause. Moreover, the causes of climate change are global, so need to be addressed primarily at a global, rather than a regional level, albeit with national targets set to tackle the issue. For this reason, climate change is included only in Management Target 13 (Annex 3), with the intention only to investigate the impacts of this phenomenon.

3.5 Stakeholder engagement

Full public involvement is required at all levels in order to successfully implement the Bucharest Convention. Barriers to public engagement including linguistic, legal, operational, as well as differing perspectives among stakeholders, politicians and policy makers, need to be overcome to achieve wider public “buy-in” to the aims and achievements of the Black Sea Commission. This will continue to be done through awareness-raising activities (e.g. the celebration of International Black Day) and improved outreach programmes, such as regional information networks and information exchange mechanisms. However, it needs to be acknowledged that effective engagement of civil society in planning, management and decision-making can only be accomplished by on-going encouragement, strengthened capacities, and financial commitment by donors and countries.

3.6 Institutional organisation of the BSC and subsidiary bodies

With the end of 15 years of GEF-UNDP financial and technical support for the operation of the Commission and its subsidiary bodies, there is a need to revise and restructure the staffing

and operation of the Permanent Secretariat, whilst increasing the effectiveness of the Advisory Groups and Activity Centres.

3.6.1. The Commission
The Black Sea Commission shall take a proactive role in promoting the objectives of the BS SAP and improving the visibility of the Black Sea Commission.

3.6.2.The Permanent Secretariat
Strengthening of the Permanent Secretariat is of paramount importance for the implementation of the provisions of the Convention and the BS SAP. The Black Sea coastal states consider essential to manage the responsibilities and work load and will ensure support to have fully staffed and highly operational Permanent Secretariat.

3.6.3. The Advisory Groups and Activity Centres
Contracting Parties shall further support and strengthen the institutional capacity of the Advisory Groups and Activity Centers. The role of these bodies will be analysed and if necessary enhanced to ensure effective implementation of the SAP and the Convention.

4. Legal and Institutional Framework of SAP Implementation

A legal framework shall enable the effective fulfillment of SAP recommendations and an institutional framework for coordination and articulation of the respective environmental mandates of the Black Sea governments, and the functions thereby delegated to the Black Sea Commission.

4.1 Legal framework

Coastal countries' activities in the field of environmental protection of the Black Sea are regulated under the Convention on the Protection of the Black Sea against Pollution, its Protocols and other relevant national/international legislation. The Black Sea countries are also bound by international environmental agreements and conventions. A large number of conventions and agreements have been signed and ratified by all six countries, providing a good basis for improvement of transboundary cooperation. International / transboundary cooperation is also supported through bi/tri-lateral agreements.

Bulgaria, Romania and Ukraine are also parties to the Danube River Protection Convention, which forms the overall legal instrument for cooperation and transboundary water management in the Danube River Basin. All Black Sea countries are members of the Black Sea Economic Cooperation Organization, where the cooperation is ensured through a Memorandum of Understanding. Being members of the European Community Bulgaria and Romania have expressed the need to ensure the full participation of the European Community in the BSC and the issue will be addressed in accordance with the procedures under the Convention.

There are a number of regional economic organizations with which the Black Sea countries may cooperate in achieving the goals of the SAP.

Changes of the present legal framework are expected to occur at the regional level. These changes may include: ratification by all six countries of the 2003 Black Sea Biodiversity and Landscape Conservation Protocol, adoption and ratification of the Protocol on the Protection of the Marine Environment of the Black Sea from Land-Based Sources and Activities and of the Legally Binding Document on Fisheries. In addition, the 1996 BS SAP is replaced by updated BS SAP 2009, following political negotiations and ministerial agreement. Implementation of regional (and wider international) agreements and policies into national legislation requires the formation of national management structures, for example, Inter-Ministerial Coordination Committees.

In order to strengthen and coordinate regional cooperation related to the transboundary problems of chemical pollution, changes in habitats, biodiversity and marine living resources and eutrophication, all six coastal countries shall endeavour to:

- Agree on negotiated amendments to the Bucharest Convention
- Sign and ratify the 2003 Biodiversity Protocol by all Contracting Parties to the Bucharest Convention
- Adopt and ratify the Revised LBSA Protocol
- Finalise and present for negotiations and signing the legally binding document on Fisheries
- Join other relevant global/regional conventions and harmonize with relevant international and regional policies, where applicable.
- Improve enforcement of relevant national environmental legislation

4.2 Institutional framework

Following agreement at Ministerial level, national implementation of the SAP shall be the responsibility of the governments of the Black Sea Countries and coordination of the its implementation at the regional level shall be entrusted to the Commission on the Protection of the Black Sea Against Pollution.

Black Sea Countries agree to:

- Establish and/or strengthen national Inter–Ministerial Coordination Committees to ensure integration of the SAP objectives into national plans
- Appoint/nominate, under the leadership of the Members of the Black Sea Commission, BS SAP National Focal Points, (NFPs) to be responsible for the national coordination and monitoring of BS SAP implementation
- Develop or incorporate into existing national plans (Black Sea National Action Plans or National Environmental Action Plans) activities in accordance with the targets agreed in the BS SAP 2009

- Ensure necessary expert support to the BSC Advisory Groups as it deems necessary. If additional expertise is required to provide in country support to the focal points of the Black Sea Commission Members
- Nominate the national institutions to provide data/information to the BSC focal points and consequently to the BSC Permanent Secretariat; the provided data/information

shall be validated by the National Focal Point and supervised by the BS Commissioner.

At the regional level, SAP implementation will be coordinated by the BS Commission supported by BSC Permanent Secretariat, BSC Advisory Groups and Activity Centres as in kind contribution of the Black Sea coastal states. Additional funding for SAP implementation should be sought from both public and private sectors. The Permanent Secretariat will need to maintain close communication with the NFPs, who should report annually to the BS Commission on SAP implementation status at national levels. In implementing the requirements of this document, it is expected that the BSC will act as:

- The political body developing regional environmental standards, approaches and methodologies, guidance of its own and regulations/guidelines supplementary to measures imposed by other international organisations
- The supervisory body dedicated to ensuring that SAP provisions are fully implemented by all parties throughout the Black Sea region
- The regional body responsible for supplying information to stakeholders on:

i) The state of/trends in the marine environment
ii) The efficacy of measures to protect it
iii) Common initiatives and positions which could form the basis for cooperation and decision-making in other international fora

5. Financing the SAP

5.1. National financing

Reliable funding is essential for the implementation of BS SAP. Domestic finances, both public and private, shall remain the major source of environmental protection funding in the Black Sea countries. Countries shall actively develop Public-Private Partnerships and other innovative approaches to the delivery of traditionally state-owned environmental services such as water resource management or municipal environmental infrastructure. Specific national funding arrangements for the implementation of BS SAP shall be reflected in national strategic policy documents: National BS Action Plans or National Environmental Action Plans.

5.2. International assistance

There are strong reasons for continuing the international financial assistance for the protection of the Black Sea environment. International assistance still plays an important catalytic role in overall regional cooperation. The expansion of the EU in the region has had a major impact, resulting in new opportunities for better environmental management and accessing environmental finances. The new EU Neighbourhood and Partnership instrument provides new opportunities for enhanced transboundary cooperation and access to additional finances. The priorities and approaches of donors and IFIs in the Black Sea region have steadily evolved since bilateral donors are progressively scaling down their programmes in

the area, while IFIs have increased their assistance in the form of loans. Taking into account this fact, strengthening and building of the project development capacity, at both national and sub-national levels, and donor coordination are essential. Donors have also made important progress in developing more coordinated and strategic ways of working together, for example through EU multi-donor initiatives such as the Danube and Black Sea Task Force (DABLAS). One of the key challenge for the years to come will include the scale up and disseminate the positive experiences from donor and IFI past projects, especially from GEF funded BSEP and BSERP.

Annex 1. List of Abbreviations

AC's	Activity Centres
AG's	Advisory Groups
BAT	Best Available Technique
BAP	Best Agricultural Practices
BEP	Best Environmental Practice
BOD5	Biochemical Oxygen Demand
BSIMAP	Black Sea Information Monitoring and Assessment Programme
BS	Black Sea
BSC	Black Sea Commission or Commission on the Protection of the Black Sea Against Pollution
BSERP	Black Sea Ecosystem Recovery Project
BS SAP	Black Sea Strategic Action Plan
BWM Convention	International Convention for the Control and Management of Ships' Ballast Water and Sediments
CLC'92 Protocol	1992 Protocol to the 1969 International Convention on Civil Liability for Oil Pollution Damage
CPs	Contracting Parties
DABLAS	Danube and Black Sea Task Force
DIN	Dissolved Inorganic Nitrogen
EA	Environmental Assessment
EC	European Commission
EcoQOs	Ecosystem Quality Objectives
EIA	Environmental Impact Assessment
EU	European Union
FAO	Food and Agriculture Organisation of the United Nations
GEF	Global Environmental Facility
GIS	Geographical Information System
ICZM	Integrated Coastal Zone Management
IFI	International Financial Institutions
IMO	International Maritime Organization

IRBM	Integrated River Basin Management
IUCN	International Union for Conservation of Nature
LBD	Legally Binding Document
LBSA	Land Based Sources and Activities
MARPOL 73/78	International Convention for the prevention of pollution from Ships, 1973, as modified by protocol of 1978 relating thereto
MLR	Marine Living Resources
MPA	Marine Protected Area
N	Nitrogen
NGO	Non – Governmental Organisation
NW Shelf	North – West Shelf
P	Phosphorus
PA	Protected Area
PCBs	Poly-Chlorinated Biphenyls
POPs	Persistent Organic Pollutants
PO4-P	Phosphate
PS	Permanent Secretariat of the Commission on the Protection of the Black Sea Against Pollution
QA/QC	Quality Assurance/Quality Control
RBM	River Basin Management
SEA	Strategic Environmental Assessment
TDA	Transboundary Diagnostic Analysis
UNDP	United Nations Development Programme
UWWTPs	Urban Waste Water Treatment Plants
VTOPIS	Vessel Trafic Oil Pollution Information System
WWTPs	Waste Water Treatment Plants
WWTWs	Waste Water Treatment Works

Annex 2. Glossary of Terms

Best Available Technique	The latest stage of development (state of the art) of processes, facilities or methods of operation, which indicate the practical suitability of a particular measure for limiting emissions and waste. "Techniques" include both the technology used and the way in which the installation is designed, built, maintained, operated and dismantled.
Best Agriculture Practice	A practice that minimizes the risk of causing pollution while protecting natural resources and allowing economic agriculture to continue.

Best Environmental Practice	A practice that minimizes the risk to the environment.
Biochemical Oxygen Demand (5 day test)	The amount of oxygen used for biochemical oxidation by a unit volume of water at a given temperature over a 5-day period. BOD5 is an index of the degree of organic pollution in water.
Causal Chain Analysis	An analysis of the immediate, underlying and root causes leading to the generation of an environmental problem.
Clean Technology	A diverse range of products, services, and processes that harness renewable materials and energy sources, dramatically reduce the use of natural resources, and cut or eliminate emissions and wastes
Coastal area	The part of the land affected by its proximity to the sea, and that part of the sea affected by its proximity to the land as to the extent to which man's land-based activities have a measurable influence on water chemistry and marine ecology.
Dissolved Inorganic Nitrogen	DIN is the sum of the concentrations of nitrate and ammonia. Nitrogen (in its different forms) is a major plant nutrient.
EU Neighbourhood and Partnership Instrument	The financial instrument under which EC assistance to Eastern Europe, Southern Caucasus and South Mediterranean countries is provided since 1st January 2007. It replaces MEDA and TACIS Instruments.
The Danube and Black Sea Task Force	The DABLAS Task Force comprises a number of representatives from the countries in the region, the International Commission for the Protection of the River Danube (ICPDR), the Black Sea Commission, International Financing Institutions (IFIs), the EC, interested EU Member States, other bilateral donors and other regional/ international organisations with relevant functions. The European Commission DG Environment holds the Secretariat of the Task Force.
Ecological Quality Objective	A desired level of ecological quality relative to predetermined reference levels.
Ecosystem Approach	The ecosystem approach is the primary framework for action under the Convention on Biological Diversity. It represents a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way. The ecosystem approach recognizes that humans are an integral component of many ecosystems. A

	description of the ecosystem approach, operational guidance and recommendations on its application were endorsed by the Fifth Meeting of the Conference of the Parties to the CBD Convention (decision V/6). All six BS Countries are parties to the CBD Convention.
Eutrophication	Excessive nutrient concentrations in a waterbody, usually caused by emissions of nutrients (animal waste, fertilizers, sewage, etc.) from land, which cause a dense growth of plant life (phytoplankton and benthic macrophytes/ macroalgae). The decomposition of the plants depletes the supply of oxygen, leading to the death of animal life.
Integrated Coastal Zone Management	Integrated coastal zone management (ICZM) is a dynamic, multidisciplinary and iterative process to promote sustainable management of coastal zones. It covers the full cycle of information collection, planning (in its broadest sense), decision making, management and monitoring of implementation. ICZM uses the informed participation and cooperation of all stakeholders to assess the societal goals in a given coastal area, and to take actions towards meeting these objectives. ICZM seeks, over the long-term, to balance environmental, economic, social, cultural and recreational objectives, all within the limits set by natural dynamics.
Integrated River Basin Management	A holistic approach addressing, in addition to quality of rivers, lakes, transitional waters, coastal waters and groundwaters, pressures within the catchment that may cause deterioration or provide risk to water and its ecology. It requires better understanding of pressures and their impacts on waters and the response of aquatic systems, as well as a collaborative planning and decision-making process in cooperation with all stakeholders in the river basin.
London Protocol	The London Protocol was agreed in 1996 to further modernize the "Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter 1972", the "London Convention" and, eventually, replace it. Under the Protocol all dumping is prohibited, except for possibly acceptable wastes on the so-called "reverse list". The Protocol entered into force on 24 March 2006.
Marine Protected Area	An area of sea (or coast) especially dedicated to the protection and maintenance of biological diversity, and of natural and associated cultural

	resources, and managed through legal or other effective means.
MARPOL 73/78	International Convention for the prevention of pollution from Ships, 1973, as Modified by protocol of 1978 relating thereto.
Poly-Chlorinated Biphenyls	PCBs include many different chemicals (congeners) that come in various forms including oily liquids, solids and hard resins. PCBs are organochlorines that were manufactured until the mid-1980s, after which they were banned due to their toxicity and persistence. They are fat-soluble, so bioaccumulate in the tissues of animals. Exposure to PCBs can permanently damage the nervous, reproductive and immune systems of the human body. They are also potent carcinogens. The disposal of wastes containing PCBs is regulated by the Basel Convention.
Polycyclic Aromatic Hydrocarbons	PAHs are a very large number of naturally occurring and man-made chemicals. They are insoluble in water but dissolve readily in fats and oils. Well-known PAHs include the compounds benzo[a]pyrene, fluoranthene, naphthaline and anthracene.
Persistent Organic Pollutants	POPs are chemicals that remain intact in the environment for long periods, accumulate in the fatty tissue of living organisms and are toxic to humans and wildlife. The term includes chemicals like DDT, chlordane, and endrin, dioxins and furans, among many others. The Stockholm Convention is a global treaty to protect human health and the environment from persistent organic pollutants (POPs). In implementing the Convention, governments agree to take measures to eliminate or reduce the release of POPs into the environment.
Precautionary Principle	A guiding framework for decision-making that anticipates how actions could affect the environment and health of future generations. The Principle emphasizes public participation and stakeholder collaboration in long-term environmental health and ecological policies and programmes. The precautionary approach encompasses five primary components: 1. An obligation exists to examine a full range of alternatives, including doing nothing. 2. Government, business, and community groups as well as the general public, share this responsibility for anticipatory action 3. Communities right to knowledge. The burden

	to supply this information lies with the proponent, not with the general public. 4. Full cost accounting. Short- and long-term time thresholds should be considered when making decisions. 5. Decisions must be transparent, participatory, democratic, and informed by the best available independent science.
Polluter Pays Principle	An environmental law principle in which the polluting parties pay for the damage done by their actions to the natural environment.
Principle of Preventive Action	An environmental law principle requiring the prevention of damage to the environment, with obligations to reduce, limit or control activities that might cause or risk such damage.
Strategic Action Plan	A regional strategic plan of measures designed to tackle the major environmental problems of a transboundary waterbody
Sustainable Agriculture	The ability to farm food indefinitely, without causing irreversible damage to ecosystem health. Two key issues are biophysical (the long-term effects of practices on soil properties and processes essential for crop productivity) and socio-economic (the long-term ability of farmers to obtain inputs and manage resources such as labour).
Sustainable Development	Sustainable development is a socio-ecological process characterized by the fulfillment of human needs while maintaining the quality of the natural environmental indefinitely.
Transboundary Diagnostic Analysis	An assessment, through which the water-related environmental issues and problems of a region are identified and quantified, their causes analysed and their impacts assessed.

Annex 3. EcoQO Matrices

Each EcoQO consists of a number of short-, mid- and/or long-term management targets that address the root causes of the concern areas. For regional level interventions, the Black Sea coastal States and the international partners shall work collectively to take the required steps to fulfill the intervention. The national level supporting interventions will be the responsibility of the individual states. The EcoQOs and their targets are listed below, including outputs, time to implement, legal, institutional and policy reforms required, indicators of success, priorities and uncertainties. It is worthy to note that, having regard to the ecosystem approach, the management targets 2 to 10 are recommendations made to competent authorities on fisheries management.

EcoQO 1: Preserve commercial marine living resources.
EcoQO 1a: *Sustainable use of commercial* fish stocks and other marine living resources.

MANAGEMENT TARGET	**ANTICIPATED OUTPUTS**	**aTIME**	**bREFORMS**	**cINDICATORS**	**dPRIORITY**	**UNCERTAINTIES**
a**Time** required to implement, bLegal, institutional or policy **reforms** required, c**Indicators** of success, dRelative **priority**: high, medium, or low,						
Policy/legislation						
(1). Adopt and implement a Regional Agreement for fisheries and conservation of living resources of the Black Sea	Stocks managed in a sustainable manner		LBD on fisheries adopted in all Black Sea countries	Regional agreement on fishery management signed and enforced.	High	Position of EC on behalf of Bulgaria and Romania
Short-term target Introduce quota regime for turbot and other demersal fish stocks	Management of the state of fish stocks in sustainable way	5 years		Increase in biomass of demersal fish stocks of 30%		
Mid-term target Establish remote sensing (satellite) system for observing and controlling fishing operations in open sea	Control of fishing vessels during the closed season and protection of the closed areas	10 years		End of poaching activity in open sea		
Monitoring and assessment						
(2). Harmonise and improve methodologies for the collation of fisheries statistic data and for assessment of the fish stocks at a regional	Knowledge of the state and fluctuations of the exploited stocks improved; Effective control/improved statistical system for		Adoption of national requirements for collection and processing of fishery statistics		High	Political will to establish common system Differences in scientific community Conflict of interest between

level **Short-term target** Stock assessment methodologies agreed for all demersal fish, anchovy and sprat Methodologies agreed by all 6 countries for improved estimation of individual species and total fish landings **Mid-term targets** Undertake regular, and where possible, coordinated stock assessments of all commercially important fish Reporting of improved landing statistics to the Black Sea Commission and FAO	data collection Improved methodologies developed and agreed by all 6 countries Improved fisheries data collection, reporting and assessment	3-4 years 5-6 years 5-6 years		Methodologies developed and accepted by all 6 countries for harmonised stock assessments to be undertaken and improved landing statistics to be collected Reporting of improved statistics to the Black Sea Commission and FAO		stakeholders
Capacity-building of regulatory/enforcement authorities						
(3). Increase resources to regulatory	Increased protection of marine living	1 – 5 years	Yes	Number of staff employed in	Medium	Political willingness

bodies responsible for fisheries management	resources			enforcement activities Number of permits/licenses granted Number of inspections undertaken Number of fees/measures applied/taken for non-compliance		Financing

EcoQO 1b: *Restore/rehabilitate stocks of commercial marine living resources.*

MANAGEMENT TARGET	**ANTICIPATED OUTPUTS**	**aTIME**	**bREFORMS**	**cINDICATORS**	**dPRIORITY**	**UNCERTAINTIES**
a**Time** required to implement, bLegal, institutional or policy **reforms** required, c**Indicators** of success, dRelative **priority**: high, medium, or low,						
Management, Policy and Legislation						
(4). Improved regionally-agreed system to match fishing efforts to stocks	Common prohibition periods/terms for shared and migratory stocks; Harmonised scientific approach and standardized regulations	3-6 years	Yes	See EcoQO 1a, Target (2) See EcoQO 1a, Target (1)	High	Political will to established common system Differences in scientific community Conflict of interest between stakeholders
(5). Ban on non–precautionary fishing technologies in force (notably dredging and bottom trawling	Protection of benthic environment (improved habitats for reproduction of demersal fish and invertebrates Ban of unsustainable fishing	3 years	Yes	Document drafted	High/ Medium	Effective Control Interest of stakeholders

Short-term target Develop draft document, including detailed regionally-agreed definition of unsustainable fishing gear **Mid/long-term targets** Agreement signed and ratified Effectiveness of ban assessed	practices Draft agreement developed Agreement adopted and ratified Surveys of known impacted zones to assess recovery	6 years 10+ years		Document signed by all countries Number/scope of surveys funded and undertaken		
(6). Introduce instruments including management, economic and legal to ensure increased production from environmentally friendly mariculture to encourage a decrease in fishing effort.	Decreased fishing effort on natural living resources Increased production from mariculture – impact assessment on the environment	5 years	1. Policy reforms to encourage/ support relevant activities	Significantly increased production from environmental friendly mariculture	High/ Medium	Negative effect of aquaculture on the environment
(7). Develop regulations aimed at decreasing by-catch level **Short-term target**	Low levels of by-catch/discards; Selectivity of the fishing gears introduced.	3 years	Yes	By-catch levels are low or negligible Agreement	High / Medium	By-catch is strongly related to net mesh size. Small net sizes are required for small fish, such as anchovy and sprat, the landings of which are overwhelmingly

Establish regionally agreed minimum permitted length of commercial fish and minimum mesh sizes for target species **Mid-term target** Robust enforcement of regulations		7 years		established Number of vessel inspections undertaken Biomass of enforced discards		Turkish. Actions would therefore require a substantial change in Turkish fisheries management.
(8). Elaborate and implement measures for increasing of the fish recruitment for the protection of juvenile commercial fish **Short-term targets** Identify and introduce closed nursery areas Establish and introduce closed seasons for demersal fish	Properly managing the exploitation of the stock Introduction of closed nursery areas Introduction of closed seasons for turbot and other demersal fish	4 years 4 years	Yes	Measures elaborated and agreed by all countries Juvenile stocks increase Area of closed nursery waters Closed seasons introduced	Medium	Establishment of flexible approach for introduction of a closed season and closed areas
(9). Minimise ghost fishing caused by discarded,	Amendment to draft LBD on fisheries, identifying	5-10 years	Yes	Draft amendment produced.	Medium	This represents a further layer of complication to acceptance of the

abandoned or lost fixed and floating nets, including those used in illegal/unregulated fishing activities	national enforcement agencies responsible for the collection and, disposal of abandoned fishing gear, and where appropriate, penalisation of offending parties			Amendment agreed and ratified by all 6 countries Number/length/area of discarded nets recovered		LBD on Fisheries. Therefore, proposed as an amendment to this document once it has been accepted. Dependent on initial signing and, ratification of the draft fisheries LBD
Monitoring						
(10). Develop and introduce methodologies to assess the condition of populations of commercial marine living resources **Short-term target** Scheme developed and adopted at Commission level, including detailed methodologies **Mid-term target** Raw assessment data reported to the BSC permanent secretariat by all countries	Proper management of marine resources Document written and agreement reached Annual assessments made	2 years 7 years	1. Policy, in some countries, to ensure required data are collected	Established regionally agreed set of indicators First assessment made by the Black Sea Commission on the basis of raw data provided by individual countries	Medium	Agreement of national scientists on basis of scheme

EcoQO 2: Conservation of Black Sea Biodiversity and Habitats
EcoQO 2a: Reduce the risk of extinction of threatened species

MANAGEMENT TARGET	ANTICIPATED OUTPUTS	aTIME	bREFORMS	cINDICATORS	dPRIORITY	UNCERTAINTIES
a**Time** required to implement, bLegal, institutional or policy **reforms** required, c**Indicators** of success, dRelative **priority**: high, medium, or low,						
Management, Policy and Legislation						
11). Finalise and adopt the regional SAP for Black Sea Biodiversity, and undertake 5 yearly regional update of the list of conservation status of threatened coastal and marine species as well as list of critical habitats for these species	Finalised and adopted regional Biodiversity Strategy Development of National plans Regularly updated Red List of species and List of critical habitats Electronic version of updated BS Red Data Book of species on the web page of the BS Commission		Reflects the regional SAP for biodiversity in national policies,	Approved SAP for Black Sea Biodiversity Reduced number of threatened species and increase in their abundance. Red list of species and BS Red Data Electronic Book updated every 5 years Number of species evaluated according to IUCN criteria, categories and regional guidelines Reduced number and area of critical habitats	High	Regional Agreement may not be signed
Short-term targets Regional SAP for Black Sea Biodiversity finalised and adopted by all six countries Red list updated in 2 years time		5 years				

Mid-term target Red list of species in Annex 2 of the BSBLC Protocol updated in 4 years time		2 years				
Long-term target Red list of species updated in 12 years time, etc.		4 years 12 years				
(12). All six BS countries to adopt a regional Conservation Plan for Black Sea endangered species and develop national action plans	Regional survey. Assess species requiring conservation plan. Development of stranding network, by-catch network and network of MPAs eligible for cetaceans conservation.	5-10 years	Yes	The regional Plan is approved by the BSC National Plans developed Networks developed Endangered species abundance, distribution and threats assessed Established national and transboundary MPAs; Methodology developed to reduce significant by-catches of cetaceans	Medium	Political acceptance Availability of necessary funds for its implementation in each BS country
Climate change						
(13). Assess impacts of climate change on Black Sea ecosystem and	Knowledge on the impacts of climate change improved	3-5 years	No	Comprehensive study on the consequences of climate change in the Black Sea	Medium/ Low	Options to address the causes of climate change lie in the development of national programmes and multi-national

	sustainable development of the coastal population				region		agreements, such as the UN Framework Convention on Climate Change (incorporating the Kyoto Protocol) Differences in scientific community

EcoQO 2b: Conserve coastal and marine habitats and landscapes

	MANAGEMENT TARGET	**ANTICIPATED OUTPUTS**	**aTIME**	**bREFORMS**	**cINDICATORS**	**dPRIORITY**	**UNCERTAINTIES**
a**Time** required to implement, bLegal, institutional or policy **reforms** required, c**Indicators** of success, dRelative **priority**: high, medium, or low,							
	Management, Policy and Legislation						
	(14). Consider the necessity of creation of new and/or expansion of existing protected areas, including transboundary areas in consultation with the relevant Black Sea coastal countries with particular attention to the marine protected areas **Short-term target** Develop harmonised approach for the identification of Black Sea PAs	A sufficient number, size and network of coastal and marine BS PAs, to ensure the conservation of natural ecosystems and processes ensuring long term continuity between areas Methodology developed for identification, characterisation and assessment of the areas of high regional importance	5 years 5-7 years	Yes	Number and total area of marine and coastal PA's increased :		Funding Political acceptance

Mid-term target Produce list of receommended Coastal/Marine Protected Areas	(potential protected areas) List of recommended areas for designation as protected.					
(15). Further recognise and implement integrated coastal zone management principles **Short–term target** Develop ICZM Guidelines	Common understanding of what ICZM is and how to apply it Clear boundaries of the coastal zone eliminate uncertainties about responsibilities Acceptance that conservation of coastal habitats and species is of equal relevance to socio-economic development	5 years	Yes	Number of policies, plans or legislative acts related to the coast that reflect ICZM principles BS Regional ICZM Guidelines written and accepted		Political acceptance Financial constraints
(16). Develop and disseminate information, training and education materials on ICZM in regional languages, referring to	Increased awareness of stakeholders to the benefits of ICZM and coastal biodiversity conservation	1 – 3 years	No	Number of publications produced and disseminated Number of training workshops		Openness of existing institutions to integrate ICZM teaching content into curriculum Support by Ministries of Education Political

coastal biodiversity conservation **Short-term target** Educational materials produced and disseminated **Mid-term target** National training exercises held		3-6 years		held		acceptance
(17). Regionally converge Environmental Statement, Environmental Impact Assessment and Strategic Environmental Assessment procedures **Short-term target** Development and acceptance of guidance document by BSC **Mid-term target** Harmonisation and/or introduction of national ES/EIA/SEA legislation in all 6 countries	Revision of preliminary plans/ programmes with unacceptable consequences for coastal biodiversity Spatial plans balance different coastal uses, including biodiversity conservation in a fair manner Agreement on a list of assessment indicators Agreement on assessment methodology	3 years 7 years	Yes	EA/EIA/SEA procedures for the Black Sea region Number of EIA and SEA studies conducted in accordance with regional guidance/national legislation Harmonised guidance document produced and agreed to by all 6 coastal countries National legislation developed/adapted to take account of regional guidance document		Enforcement Financial constraints

(18). Amend national waste strategies and national coastal zone management plans with the aim of marine litter minimisation **Short-term target** Amendments to national strategies accepted, where required **Mid-term targets** Clean-up of unregulated/illegal riverine and coastal dumping sites Amendments to national strategies incorporated into local, costal and landfill site management plans	Reduced input of land-derived solid waste to the marine environment	1-3 years 3-6 years 3-10 years	Change in strategy, if not policy	Amendments incorporated into national strategies Number of illegal costal dumping sites cleaned-up Changes in strategies incorporated in national/local coastal management plans Number of operational plans at regulated river/coastal landfill sites amended to reduce input of solid waste to rivers or directly to the Black Sea		Costs very difficult to estimate. National waste strategies exist, but not clear whether costal zone management plans exist for all coastal regions
(19). Develop regional and national marine litter monitoring and	Improved quantification of marine litter and identification	1-6 years	Yes, policy at least	Regional guidance produced and distributed by		Likely to require extensive involvement of NGO community/volunt

assessment methodologies on the basis of common research approaches, evaluation criteria and reporting requirements	of sources, allowing improved prosecution of offenders			BSC. National programmes developed, funded and operational Results reported to BSC for incorporation within a regional marine litter database		eers to prevent costs from escalating
(20). Promote/develop investment projects within national strategies/local plans to engineer, construct and install new solid waste recycling facilities and incineration plants, complying with BAT regulations	Improved recycling/ incineration of solid waste, resulting in reduced solid waste for disposal to landfill and reduced atmospheric emissions from incinerators	Continuous improvement over 15+ years		No of project outlines developed No. of projects financed No. of projects completed		Projects need to be cost-efficient and "bankable"
Monitoring						
(21). Monitor and facilitate the progress in the implementation of nationally developed management plans for designated protected areas	Regional assessment of the progress of the management of BS protected area	1-5 years	Yes	Approved Management plans printed and/or placed on web site(s) Improved state of the protected areas	High	Financing for implementation and enforcement Low level of enforcement
(22). Develop an inventory, classification and a mapping	Improved knowledge of BS habitats	1-7 years		Approval of classification system by the scientific	High / Medium	Acceptance of proposed classification system by

system for BS habitats	GIS maps and list of BS threatened habitats			communities in the BS region Inventory and classification of coastal and marine habitats completed and published BS Habitats Maps available on the web page of the BSC Regularly (5 years) updated list of the BS threatened habitats on the web page of the BSC		individual countries and BSC Availability of funds for each BS country
(23). Identify and make an inventory of Black Sea landscapes of high natural, historical, cultural and aesthetic value	Regionally agreed guidelines for identification and characterization of the BS landscapes Improved knowledge of the BS Landscapes	1 -10 years	No	BS landscapes of high natural, historical, cultural and natural, Natural, historical, cultural and aesthetic value of key landscapes identified Inventory completed	Medium	Political acceptance
(24). Undertake preliminary regional assessment of coastal erosion	Preliminary assessment would identify sites of high erosion/depo	3 years	No, but report should include recommendations for	Report produced, including recommendations	Low	Expensive and complex issue to address fully Identified in the initial stages of

	sition, consider impacts and options for management (sea defence construction, artificial beach nourishment, managed retreat, etc.)		regional/ national policy developmen t			the TDA process as being primarily a multi-national, rather than transboundary issue. Therefore given a low priority. Potential funding for regional project currently being sought by BSC Permanent Secretariat
Capacity-building of monitoring staff						
(25). Support coordinated scientific studies, increase resources to marine scientists and improve capacity particularly through targeted training programmes supporting scientific projects/progra mmes	Increased knowledge of BS ecology/che mistry	1 – 5 years	Yes	National budgets allocated to BSIMAP-participating laboratories to undertake BSIMAP-specific monitoring, Number of BSIMAP-participating staff attending capacity-building events (training workshops, conferences, etc.)	High/ Mediu m	Financing

EcoQO 2c: Reduce and manage human mediated species introductions

MANAGEME NT TARGET	**ANTICIPAT ED OUTPUTS**	**aTIM E**	**bREFOR MS**	**cINDICATO RS**	**dPRIORI TY**	**UNCERTAINT IES**
a**Time** required to implement, bLegal, institutional or policy **reforms** required, c**Indicators** of success, dRelative **priority**: high, medium, or low,						

Management, Policy and Legislation						
(26). Promote cooperation in the Black Sea in line with principles and recommendations of the International Convention for the Control and Management of Ships' Ballast Water and Sediments	Overview of BS states national legislation relevant to ballast water management	1-2 years	Yes	Level of compliance with the provisions of the BWM Convention	High	Low enforcement of existing national legislations on introduction of new exotic species
(27). Harmonise ballast water procedures using IMO guidelines	Agreed areas of exchange and amount of exchanged waters, agreed controls of ballast waters in ports Enhanced control of transfer of alien species	1-5 years	Yes	Harmonised national legislations on ballast water exchanging control	High	
(28). Identify actions towards ratification of the BWM Convention in the BS region	Road map to reduce the risk of alien species invasion	1-7 years	National plans for BWM management	Road map produced and acted upon	High	Political acceptance

EcoQO 3: Reduce eutrophication

MANAGEMENT TARGET	**ANTICIPATED OUTPUTS**	**aTIME**	**bREFORMS**	**cINDICATORS**	**dPRIORITY**	**UNCERTAINTIES**
a**Time** required to implement, bLegal, institutional or policy **reforms** required, c**Indicators** of success, dRelative **priority**: high, medium, or low,						
Nutrient Management Policies						
(29). Implement integrated river basin			Yes		High	Political acceptance of LBSA protocol

management and integrated coastal zone management approaches, as stated in revised LBSA protocol **Short-term target** Adoption of LBSA **Mid/Long-term target** Implementation of River Basin Management principles	Revised LBSA protocol ratified by all BS countries Adoption of a River Basin based' approach to managing eutrophication	2 years 4-15 years		Adoption of LBSA protocol Introduction of River Basin Management (RBM) principles in BS basin by all countries, with appropriate reporting through the BSC		Financing to implement catchment management throughout basin
(30). Introduce cost efficiency approach to nutrient management in all BS countries	Reduced costs to tackle the issue of excessive nutrient emissions.	6-7years	Possibly	Studies undertaken in all BS countries to identify cost efficient approaches	Medium	Acceptance by all BS countries of methodology National resources available to implement national studies. Countries will still have to comply with existing national legislation, even if this requires them to undertake a more a more expensive approach to nutrient pollution management
(31). Upgrade all WWTPs serving populations > 200,000 p.e. within the six BS country sub-basins to include N&P	Overall: reduced nutrient loads from WWTPs.	2	No	Priority lists of	High/ Medium	Political acceptance Financing availability

	removal **Short-term target** Identify WWTPs requiring upgrade **Mid/Long-term target** Upgrade identified WWTPs	Priority list prepared for investments (See EcoQO 4 – Chemical Pollution) Upgraded WWTPs (See EcoQO 4 – Chemical Pollution)	years 9 -20 years		WWTPs for upgrade Financing plans developed. Number of identified WWTPs upgraded		
	(32). Ensure all tourist resorts are connected to sewerage systems with WWTPs of adequate capacity to address seasonal loads	Reduced loads of N/P etc. and improved bathing water on beaches Improved environmental sustainability of tourism sector Priority lists for upgrading sewerage connections and / WWTPs in tourist centres		No	Reduced marine pollution and improved bathing water quality	Medium / High	Agreement to protect tourist centres from civil wastewater Financing availability
	Short-term target s Identify locations in need of connection to sewerage systems and required capacity of WWTPs Preparation of national priority lists for	(See EcoQO 4 – Chemical Pollution)	2 years		Prioritised list for upgrading sewerage and WWTPs in tourist centres		

investments						
Long-term target Implement upgrading of priority sewerage systems and WWTPs		10 – 20 years		Identified priorities incorporated into national finance plans Number of priority list actions implemented		
(33). Ensure that all industrial plants have adequate wastewater treatment to reduce N&P emissions from direct discharge to surface waters **Short-term target** Develop prioritised list of investments needed based on hot-spot analysis. **Long-term target** Implement investments to reduce industrial pollution	Hot-spots from industrial discharges identified Reduced N/P discharged (See EcoQO 4 – Chemical Pollution)	1 year 10 – 20 years	No	Updated hot-spot analysis for BS region Agreement of prioritised list of industrial discharges to be addressed Agreed financing plan (private, national and international sources) Completion of investments to reduce industrial discharges	High / Medium	Lack of agreement on priorities Insufficient legal resources to encourage industries to comply Funding
(34). Reduce or phase out the use of high P-containing laundry	Significantly reduced P loads (>20% reduced from domestic sources) to the BS		Yes		High	Opposition from industry (P producers and possibly detergent manufacturers)

detergents **Mid-term target** Promote the production, distribution and use of P-free detergents in all 6 countries **Long-term target** If necessary, introduce compulsory bans where voluntary measures prove unsuccessful	Developed strategies in each country to address high-P laundry detergents	6-7 years 10+ years		Low-P products available for consumers Reduced P loads discharged from WWTPs High-P-containing laundry detergents no longer sold		Political acceptance of the benefits
(35). Introduce harmonized P and N standards for all WWTPs serving >100,000 p.e. Ensure compliance with and harmonise standards at regional level **Short-term target**	Reduced N/P emissions through improved management and enforcement of standards Agreed quantitative nutrient discharge standards	2 years 10 + years	Yes	Standards agreed Monitoring results show reductions and compliance with standards Prosecution numbers of dischargers	Medium	Political acceptance of standards Resources available for monitoring and enforcement Resources available to ensure WWTPs are upgraded where necessary

Agree on harmonized N and P standards **Long-term target** **A**dherence to standards through improved enforcement				failing to meet standards		
(36). Reduce atmospheric emissions of N from municipal, agricultural and industrial sources, though the introduction of BAT, BAP principles etc.	Reduced atmospheric deposition of N in BS; Improved understanding of sources of atmospheric N in region (Link with EcoQO – Chemical Pollution)	10+ years	Yes	Lists of sites where N emissions are established	High/ Medium	Uncertainty over % N derived from atmospheric sources Resources needed to undertake modelling studies and implement monitoring network
Monitoring and Modelling						
(37). Harmonise the monitoring and assessment of N&P in major rivers and straits **Short-term target** **A**gree the procedures	Improved knowledge of N/P loads discharged into the Black Sea enabling improvements to be readily identified and reported to the BSC and other stakeholders. Agreed procedures recommended	2 years 10 years	Yes	Agreement by all countries to adopt common procedures for nutrient load monitoring and reporting with common QC/QA procedures	High	Regional agreement on procedures Funding to undertake monitoring

(determinants, methods, QA/QC frequency, locations, reporting, interpretation etc.) **Mid-term target** Implement the agreed load monitoring procedures for major rivers discharging into the Black Sea	for adoption and implementation All countries adopt harmonised procedures for monitoring nutrient loads discharged to the Black Sea (Link with EcoQO – Chemical Pollution)			All countries undertake and report agreed data to the BSC Trend analysis on nutrient loads utilised by policy makers within 10 years of all countries undertaking monitoring.		
(38) Improve network of atmospheric deposition monitoring stations around the Black Sea coast (at least 1 per country) **Short-term target** Agree location, monitoring procedures etc. for atmospheric deposition monitoring program/ network	Better understanding of the estimates of atmospheric deposited pollutants enabling more reliable management decisions to be taken at sources of pollutants (Link with EcoQO 4 – Chemical Pollutants)	5 years 10 + years	No	Monitoring network agreement Monitoring implemented Results from atmospheric deposition of N reported by all countries regularly to the	Medium	Need for agreement on procedures etc. Funding to establish and operate monitoring network

Long-term target Implementing the agreed atmospheric monitoring network				BSC		
(39). Develop a nutrient modelling tool to enable source apportionment estimates to be made **Short-term target** Define and agree functionality and operation of nutrient model. **Mid-term target** Develop and test model leading to an operational tool with results accessible to policy makers in all countries	An agreed modelling tool for all major rivers discharging into the Black Sea	2 years 10 years	No	Agreed specification and functionality of model Countries provide data to test / validate model Model used to assist policy makers address nutrient hot spots	Medium	Agreement on modelling approach Acceptance of model outputs by all countries Data availability to test and operate model Financing for development and operation of model
Agricultural sources of nutrients						
(40). Improve the use of regulatory instruments for reducing point and diffuse source pollution	Clear definition for each country of the minimum standards of farm management to reduce the risk of nutrient pollution e.g. closed periods for application of		Yes – in some countries. .		High	Common understanding and acceptance of the BAP concept by all relevant governmental institutions, NGOs and

from agriculture **Mid-term target** Where necessary, introduce new/improve existing regulatory instruments to control specific farming practices with a high risk of causing nutrient losses **Long-term target** Full compliance and effective enforcement of national regulatory instruments for reducing nutrient losses from agriculture	fertiliser/manure to land, restrictions on application rates, minimum storage requirements for manure etc. Introduction or improvement of national regulations to encourage minimum standards of agricultural pollution control Full compliance of farmers with these regulations	5-6 years 10+ years for all farmers to fully comply with regulations		Definition of national minimum farming standards Development and legal adoption of new/improved regulations Level of compliance with new/improved regulations Level of investment in new/improved manure storage facilities		donors Definition of the minimum standard of pollution control for reducing nutrient losses varies between countries Financing Continued donor support
(41). Where financial	Where financial resources are		Yes – in some		High/ Mediu	Common understanding

resources are available and greatest possible extent, introduce appropriate economic incentives to reduce nutrient emissions from agriculture **Mid-term target** Utilise available funds to introduce appropriate economic incentives for farmers to introduce specified management practices for reducing nutrient losses from agricultural	available, introduction of incentive schemes (e.g. agri-environment type payments) to encourage farmers to go beyond the minimum standard of agricultural pollution control and introduce specific management practices for the further reduction of nutrient losses Participation of farmers in these incentive schemes Effective impact of schemes upon water quality, particularly in areas most vulnerable to high nutrient losses	6 years depending on country 10+ years depending on country	countries In BG and RO significant reforms have already been made to use available funds from the EU Common Agricultural Policy	Total funds available for incentive schemes Effective absorption of available funding resources Number of farmers participating in incentive schemes Area of land with modified farming practices e.g. the *increased* use of crop rotations, re-integration of grazing livestock into specialised crop production systems	m	and acceptance of the BAP concept by all relevant governmental institutions, NGOs and donors Providing economic incentives is an expensive policy instrument and must be well-targeted to ensure effective use of available resources Farming practices promoted for reducing nutrient losses must be cost-effective for farmers or uptake will be limited Continuation of donor support for agricultural pollution control projects is very important in some countries Promotion and uptake of schemes requires effective agricultural

land **Long-term target** Widespread adoption by farmers of specified management practices for reducing nutrient losses from agricultural land				(traditional mixed farming systems), introduction of legumes as substitute for fertiliser nitrogen, sowing of winter cover crops, creation of uncropped buffer zones, preparation of nutrient management plans etc.		advisory services, but capacity of these can be limited
(42). Develop and expand the capacity of national agricultural extension services for promoting the control of agricultural pollution **Mid-term targets** Introduce BAP concept to national agricultural	Simple, key advisory messages and supporting advisory materials/guidelines for farmers available in all local languages of Black Sea region Publication of recommendations on fertiliser application rates for individual crops Development of a) appropriate advisory tools and b) new advisory facilities to promote good practice for reducing nutrient losses from agriculture	5-6 years depending on country	Yes – will vary between countries, but considerable reform of existing agricultural advisory services are necessary in some countries	Number of staff employed in agricultural advisory services Advisory materials/guidelines printed e.g. *Codes of Good Agricultural Practice for Protection of Water* Local training courses for	High	Common understanding and acceptance of the BAP concept by all relevant governmental institutions, NGOs and donors Continuation of donor support for agricultural pollution control projects is very important in some countries Many projects/activities have already been conducted in Black Sea countries on the reduction of agricultural pollution, an inventory of these would be

extension services and the development of key advisory messages for reducing losses of nutrients from agriculture Effective communication of key advisory messages for reducing agricultural nutrient losses by national agricultural extension services				advisers implemented New advisory tools and facilities developed e.g. farm gate nutrient balances, nutrient management plans, farmer awareness events, farm visits/open days, farm demonstration projects, etc. Number of farm visits undertaken		very useful for identifying the best examples/models to follow
(43). Promote organic farming and other low input farming systems **Short-term**	Advisory materials/ guidelines for organic farming and other low input farming systems (e.g. EUREPGAP etc.) available in all local languages of Black Sea region Relevant legislation for organic farming developed and fully harmonised with international standards Increased uptake of organic	1-3 years	Yes – will vary between countries depending upon progress to-date to harmonise legislation, develop inspection and certification systems etc.	Production and distribution of educational materials	Medium	Common understanding and acceptance of the BAP concept by all relevant governmental institutions, NGOs and donors Technical difficulties associated with conversion to organic farming Availability of advice from agricultural extension

target Raise farmer awareness of certified organic farming and other low input farming systems as viable alternatives to conventional agriculture **Mid-term target** Widespread adoption by farmers of certified organic farming and other low input farming systems	farming methods and other low input farming systems	3-10 years depending on country		Development and legal adoption of new/improved regulations for organic production Area of agricultural land under certified organic production or other recognised low input farming system Total sales of organic products Total sales of products from other recognised low input farming systems e.g. EUREPGAP etc.		services Uncertainties of the market for organic products
(44). Develop/define BAT for the design and operation of large-scale agro-industrial livestock production units, including pig and poultry farms with no land	Improved control of nutrient content of livestock feed. Technical in-plant measures for the reduction of waste water volume and pollution load Reduction of nutrient emissions by end-of-pipe measures Improved		Yes		High / Medium	Common understanding and acceptance of the BAT concept by all relevant governmental institutions, NGOs and donors Low-nutrient animal feeds could have higher costs Availability of financial

Short-term target Introduce necessary legislation for application of BAT to agro-industrial units **Mid-term target:** Full introduction of BAT for all agro-industrial units in Black Sea region	environmental management e.g. improved disposal of livestock waste to land, close co-operation with environmental authorities etc.	3-5 years for regulatory framework 6-10 years to fully introduce / enforce regulations		Regulations drafted and adopted in all 6 Black Sea countries Number of agro-industrial production units modernised with a) technical in-plant measures e.g. separation of solid and liquid wastes, modification of livestock feed, mechanical cleaning rather than cleaning with liquids etc. and b) end-of-pipe installations		resources for investment in BAT

EcoQO 4: Ensure Good Water Quality for Human Health, Recreational Use and Aquatic Biota

EcoQO 4a: Reduce pollutants originating from land based sources, including atmospheric pollutions

MANAGEMENT TARGET	**ANTICIPATED OUTPUTS**	**aTIME**	**bREFORMS**	**cINDICATORS**	**dPRIORITY**	**UNCERTAINTIES**
a**Time** required to implement, bLegal, institutional or policy **reforms** required, c**Indicators** of success, dRelative **priority**: high, medium, or low,						
Policy / Legislation						
(45). All BS states agree to implement provisions of	LBSA protocol ratified by all 6 countries.	1 -2 years following	Yes	Approval of the final text of the LBSA Protocol by the	High.	Dependant on signing Political

the revised LBSA Protocol to the BS Convention	.	signature by all six BS Countries		BSC Adoption of LBSA protocol by all 6 coastal countries.		negotiations could impact the recommended river basin management approach
(46). Strengthen enforcement of national/regional and international regulations on land – based pollution sources	Full compliance with the provisions of environmental legislation in and by each country	5–10 years	Yes	Level of compliance with regulations Number of permits/licenses granted Number of inspections undertaken	High/ Medium	Political acceptance Regional inconsistency in terms of approaches; Financing for implementation and enforcement
Economic instruments						
(47). Develop economic mechanisms for chemical pollution control	Regionally harmonised economic mechanisms promoting, for example, BAT/BAP, recycling etc.	10 years		P-free detergent sales increased (see Target (36)) Number of farmers applying BAP Number of installation using BAT Well functioning advisory services	High	Political acceptance of economic instruments
(48). Introduce and disseminate the concept of BAP and BEP as a tool for encouraging farmers to deliver the highest level of on-farm pollution control	Published guidelines on BAP and BEP concept for the Black Sea Region Appropriate activities to introduce BAP and BEP concept to relevant governmental		Yes – will vary between countries, but various reforms may be necessary to implement the BAP and BEP concept		High	Common understanding and acceptance of the BAP and BEP concept Selection of appropriate experts Inter-ministry cooperation needs to be established

	institutions, NGOs and donors Black Sea countries agree to adopt BAP and BEP concept	1-5 years		Guidelines developed in all countries in local languages Guidelines printed and/or placed on website(s)		/improved between agricultural and environment ministries Enforcement of regulations
Short–term target Introduction of BAP and BEP concept to relevant governmental institutions, NGOs, donors etc.	Inclusion of BAP and BEP concept in national strategies for protection and rehabilitation of the Black Sea	5-10 years		Number of regional/national dissemination workshops held Number of integrated pollution control programmes adopted – including new/improved regulations, economic incentives (where resources available) and strengthened extension services		Funding available to assist dissemination of BAP and BEP concept and to encourage implementation by farmer
Mid–term target Full adoption of the BAP and BEP concept by relevant governmental institutions , NGOs, donors etc. and widespread practical implementation by farmers	Development of integrated programmes for reducing agricultural pollution at local/national level (depending on nature/scale of pollution problems) with a mix of regulatory, advisory and economic measures (where resources are			Improved dialogue between Environment and Agricultural ministries through inter-ministerial meetings		

	available) Greater public awareness and transparency regarding agricultural pollution					
Pollution Management Policies						
(49). Introduce BAT and BEP for the most polluting industries in all BS countries **Mid-term target**s Adopt BAT principles and policies Identify priority industries to implement BAT and BEP Provide training to priority industries on BAT and BEP **Long-long-term target**	BS Countries Agree to implement BAT and BEP Environmental Management Systems implemented; Cleaner production technologies/ activities in place Reduced industrial pollution	6 years 10-15 years	Yes	National environmental legislation developed/adopted List of most polluting industries established Agreed priority list of industrial sites to implement BAT and BEP. National/regional database of polluting industrial plants established and populated with	High/ Medium	Political acceptance; Lack of enforcement of environmental legislation; Low involvement/ willingness of stakeholders Financing Lack of enforcement of environmental legislation; Limited effectiveness of economic incentives mechanisms Inter-ministry cooperation may be insufficient Low involvement/ willingness of stakeholders

Implement BAT and BEP				metadata Reduced pollutant emissions Investments made on clean technologies		
(50). Harmonise environmental quality standards throughout the Black Sea region and elaborate regionally agreed criteria for assessment of the state of the Black Sea environment **Short-term target** Harmonise environmental water quality standards **Mid-term target** Harmonise environmental sediment, biota and discharge quality standards	Improved assessment of loads entering the Black Sea and the quality of the marine environment Establishment of reference conditions and correspondin g classification system for identification of good ecological status of the Black Sea	2-3 years 5-10 years	No	Agreement of all 6 countries to use a standard operational procedure for the measurement and calculation of loads discharged from point sources of pollution (including rivers) into the Black Sea	High	Acceptance of proposed standards /methodology by individual countries and the BSC.
Environmenta l Monitoring						
(51). Develop/impro ve the existing	Improved knowledge of pollution	5 years	Yes	Acceptance of method(s) by	High	Staffing/cost issues

monitoring system to provide comparable data sets for pollutant loads (from direct discharges and river inputs) and for other parameters	loads to the Sea.			all countries Agreement of all 6 countries to participate in (and fully fund) a harmonised monitoring programme, including equipment and staffing costs Operational national quality assurance programmes for the inter-comparison / inter-calibration of chemical concentration and flow data from point sources All agreed raw data and annual loads regularly reported to the BSC		Technical issues over parameters to be measured in some countries.
(52). Improve the "list of Black Sea-specific priority pollutants" to help target monitoring priorities	Harmonised monitoring strategy of the marine environment and point (including rivers) and diffuse sources of pollution	2 years	Yes	Agreement of all 6 countries to use the list of priority pollutants BSIMAP updated/revised accordingly.	High / Medium	Staffing/Costs /technical issues
Rehabilitation / construction						
(53). Continue/improve	List of project proposals				High	Political willingness

rehabilitation /construction of wastewater treatment plants **Short-term target** Prioritise wastewater treatment investments needs **Mid-long-term target** Rehabilitation / construction of municipal and industrial treatment plants	cleared Reduced loads of pollutants from major point sources discharging directly or indirectly (via rivers).	1 – 5 years 5– 20 years	Yes No	List of investments established Investments made (DABLAS) Reduced loads of nutrients, BOD, etc.		Encouragement and enforcement of industries to upgrade WWTP Financing
Capacity building						
(**54). Optimise and/or increase resources to regulatory bodies responsible for pollution control and improve capacity through targeted training programmes**	Build capacity of environmental authorities for enforcing regulations to control discharges from both point and diffuse sources	1- 5 years	Yes	Number of staff responsible for pollution control Budget allocated for pollution control Number of staff participating in training courses, workshops, etc.	High / Medium	Political acceptance Financing

EcoQO 4b: Reduce pollutants originating from shipping activities and offshore installations

MANAGEMENT	**ANTICIPATED OUTPUTS**	**aTIME**	**bREFORMS**	**cINDICATORS**	**dPRIORITY**	**UNCERTAINTIES**

TARGET						
a**Time** required to implement, bLegal, institutional or policy **reforms** required, c**Indicators** of success, dRelative **priority**: high, medium, or low,						
Policy/legislation						
(55). Adopt the Black Sea Contingency Plan to the Protocol on Cooperation in Combating Pollution of the Black Sea by Oil and Other Harmful Substances in emergency situations (Part I – Response to oil pollution)	Adoption of the Plan by all 6 Black Sea Countries	1- 2 years	Georgia, Ukraine and Russia	Adoption of the Plan at national levels	High/ Medium	Political acceptance
(56). Develop and adopt Part II (Chemical Plan)of the Black Sea Contingency Plan to the Protocol on Cooperation in Combating Pollution of the Black Sea by Oil and Other Harmful Substances in Emergency Situations **Short-term target** Development of Part II of the Black Sea	Part II developed ,agreed and adopted by all BS countries	2-3 years 4 -8 years	Yes	Part II of the Plan finalised and sent to countries for adoption Part II of the Plan is adopted by all 6 Black Sea Countries	High	Political acceptance Financing

Contingency Plan (response to pollution from harmful substances) **Mid-term target** Adoption of Part II of the Black Sea Contingency Plan (response to pollution from harmful substances)						
(57). Establish an inter-state ministerial mechanism to enable a quick response to major pollution events	National Contingency Plans, covering both vessels and off-shore installations in place and coordinated between the Black Sea Countries		Yes	National authorities/ institutions/ stakeholders involved in contingency and emergency situations response identified in all BS Countries The mechanisms for intervention, information exchange, etc. in place National/regional contingency action plan published and operational Scheduled oil spills preparedness and response exercises, including bi-annual DELTA	High / Medium	Financing Lack of operational equipment

				exercises, agreed by countries		
(58). Adopt and enforce relevant international legal instruments for safety navigation, pollution prevention, limitation of liability and compensation **Short-term target** Cooperate and access relevant international legal instruments for safety navigation, pollution prevention, limitation of liability and compensation (MARPOL, BWM, London Protocol added in glossary etc) **Mid-term target** Enforce relevant international legal instruments for	Ratification/accession/ adoption of MARPOL 73/78 (Annexes III, IV&VI) , AFS by all six Black Sea Countries	3 – 5 years 5 – 10 years	Yes	Assessment of ratification and effective application and enforcement of relevant legal instruments All 6 Black Sea Countries are parties to the relevant legal instruments and apply an harmonized system of enforcement Ratification of legal instruments Documented enforcement of legal instruments	High/ Medium	Political acceptance Financing; Inter-institutional cooperation

environmentally safe navigation, pollution prevention, limitation of liability and compensation (MARPOL, BWM, London Protocol etc)						
(59). Improved regulations/ management of dredging/ dumping activities	Reduced transfer of dangerous pollutants into the marine environment by dumping Improved reporting to the BSC of the dredging operations and deposit sites	5-6 years	Yes	Number of permits for dredging/disposal to the Sea; Number and locations of official deposits for dredged sediments	Medium	No standardised analytical methodologies for analysis of sediments No internationally agreed guidelines for the identification of appropriate dumping sites
Waste management						
(60). Provide adequate port reception facilities for ship-generated wastes according to MARPOL 73/78, Annex I, IV, V.	Reduction of illegal discharges of ship-generated waste, including oily mixtures, noxious liquid substances, sewage, garbage and cargo residues into the Black Sea marine environment	3-10 years	Yes	Increased disposal and treatment of ship-generated wastes and cargo residues in full compliance with MARPOL 73/78 Management Plans for Ship Generated – Waste and cargo residues published/ implemented in all BS Ports Investments	High / Medium/	Financing; Low cooperation between authorities and shipping industry Low level of involvement of stakeholders in the decision-making process

				Annual Report to the BSC on port's ship waste management 3 Years assessment report of the Black Sea State of Environment		
(61). Establish a harmonised fee/cost recovery system on ship-generated waste	Reduction of illegal discharges of ship-generated waste	1-3 years	Yes	Regionally harmonised cost recovery/fee system in place.	High / Medium	Political acceptance
Surveillance/Monitoring						
(62). Develop systems for the identification of illegal pollution sources from vessels and off-shore installations **Mid-term target** System for monitoring oil pollution **Long-term target** System for	Reduced illicit chemical and solid waste discharges	5-10 years for oil pollution 10+ years for solid waste	Yes, a change in policy at least	VTOPIS or equivalent systems implemented and operational in all Black Sea countries to support national Governments in surveillance of vessels traffic and in reducing/eliminating the pollution originating from vessels, including off-shore installations System operational	Medium	Financing availability Link to remote sensing data sources for real-time monitoring. Radar required to identify source locations, but satellite remote imagery required for the identification of pollutants themselves. Unclear whether flotsam and jetsam can be viewed using satellite remote imagery May be necessary to

monitoring solid waste disposal				System operational		use aircraft for marine litter identification , which is likely to be prohibitively expensive.
Economic mechanisms/instruments						
(63).. Develop/establish a harmonised enforcement system in cases of illegal discharges from vessels and off-shore installations, including technical means and fines	Infringement of discharge regulations as well as aiding, abetting or inciting an illegal discharge is punishable	3-5 years	Yes	A harmonised system of penalties established and enforced Effective, proportionate and dissuasive	High / Medium	Political acceptance Financing Limited effectiveness of economic incentive mechanisms Inter-ministry cooperation needed.
(64). Develop a common system for claims management for pollution damages compensation	Common and effective policy on claims management	1-3 years	Yes Ukraine - CLC 92 Protocol	Common procedures and panel of experts, databases, etc.	Medium	Political acceptance Inter-institutional cooperation needed
(65). Assess the need to develop a legal framework for assessment of the transportation of hazardous wastes in line with Basel Convention	Regional Studies of the movement of Transboundary hazardous waste. Decision on the necessity of development of the Protocol on Hazardous Waste.	3-6 years	Yes, a change in policy at least		Medium / High	Inter-institutional cooperation needed Political acceptance

Annex 4. Monitoring the SAP: Process, Stress Reduction and Environmental Status Indicators

Monitoring and Evaluation (M&E) indicators are tools to monitor and verify SAP implementation. Therefore, it is necessary to elaborate an indicator set that will measure progress towards the successful outcome of the EcoQOs and the short and long term management targets. GEF establishes three types of indicators: a) process indicators, b) stress reduction indicators and c) environmental status indicators:

a) **Process** I**ndicators** focus on the processes ***or outputs*** that are likely to lead towards a desirable outcome. They demonstrate actual on-the-ground institutional, political, legislative and regulatory progress in resolving the transboundary problems in the Black Sea. They should assist in tracking the institutional, policy, legislative and regulatory reforms necessary to bring about change.

b) **Stress reduction** i**ndicators** relate to project objectives or ***outcomes***. In particular, they focus on concrete actions that reduce environmental stress. Stress reduction indicators indicate the rate of success of specific on-the-ground actions implemented by the collaborating Black Sea countries. Often a combination of stress reduction indicators in several nations will be needed to produce detectable changes in transboundary waters.

c) **Environmental state indicators** are ***goal orientated*** and focus on actual improvements of ecosystem quality that usually extends beyond the lifetime of the project. They are measures of actual success in restoring or protecting the targeted waterbody. It can take a number of years before sufficient stress reduction measures are implemented in a sufficient number of countries to detect an environmental state change in the transboundary water environment.

In order to accurately measure environmental state indicators, the collaborating Black Sea countries will need to fully harmonise their sampling/laboratory/analysis methods so that they all agree on what water quality, quantity, or ecosystem parameters that should be sampled to track progress toward a goal.

A detailed set of management targets and indicators are presented in the EcoQOs (Annex 1) that give the short, medium and long-term perspective on the actions needed. A set of

preliminary M&E indicators to measure the success of Strategic Actions Plan implementation are proposed below.

Process Indicators

1. Adoption and implementation of the SAP by all countries
2. Agreed baseline for assessing indicators of SAP implementation
3. **EcoQO 1: Preserve commercial marine living resources**

    1. Adoption and implementation of a Regional Agreement on Fishery Management
    2. Agreed stock assessment methodology for all demersal fish, anchovy and sprat
    3. Establishment of regionally agreed minimum permitted length of commercial fish and minimum mesh size for target species
    4. Development and adoption (by BSC) of detailed methodology for determining the ecological parameters for fish condition

4. **EcoQO 2: Conservation of Black Sea Biodiversity and Habitats**

    1. Official recognition by the BSC and all national governments of the Black Sea Red Data book
    2. ICZM Guidelines developed and supported by regional ICZM Declaration
    3. Increasing number of policies or legislative acts reflecting ICZM principles
    4. Development of an inventory, classification and mapping system for BS habitats
    5. Level of harmonization with provisions of the BWM Convention

5. **EcoQO 3: Reduce eutrophication**

    1. Adoption of LBSA Protocol
    2. Agreed standards for N/P for all WWTWs >100,000 p.e.
    3. Lists of emissions developed
    4. Revised list of hot-spots developed
    5. Agreed monitoring procedures and detailed environmental status indicators
    6. Agreed monitoring locations

6. **EcoQO 4: Ensure Good Water Quality for Human Health, Recreational Use and Aquatic Biota**

    1. Adoption of LBSA protocol
    2. Harmonisation of environmental water quality standards across region
    3. Agreed monitoring procedures
    4. Agreed list of BS-specific priority pollutants
    5. Renegotiation (if necessary) and adoption of the BS Contingency Plan by Georgia, Russia and Ukraine

Stress Reduction Indicators

1. **EcoQO 1: Preserve commercial marine living resources.**

1. Closed fishing seasons established
2. Number and area of no-fishing areas developed
3. Ban on unsustainable fishing practices in place

2. **EcoQO 2: Conservation of Black Sea Biodiversity and Habitats**

1. Number and total area of Protected Areas
2. Surface area of buffer zones
3. Number of EA/EIA/SEA procedures used
4. Number and area of illegal dumping sites cleaned-up
5. Number of new projects to install solid waste handling facilities

3. **EcoQO 3: Reduce eutrophication**

1. Lists of WWTWs (municipal and industrial) for upgrading with financing
2. % of P-free detergents sold in BS countries
3. Prosecution numbers of dischargers failing standards
4. Investments in agricultural facilities to reduce N/P pollution
5. Funds available for economic incentives in agriculture
6. Area of land under modified farming practices
7. Number of (and investment in) farm demonstration projects

4. **EcoQO 4: Ensure Good Water Quality for Human Health, Recreational Use and Aquatic Biota**

1. Number of permits / licences granted and inspections undertaken
2. % increases in state budget for pollution prevention
3. Number of installations using BAT
4. Number of permits for dredging disposal
5. Increases in treatment of ship-generated wastes
6. Investments in ship waste handling facilities
7. Harmonised cost recovery / fee system in place for ship-generated waste

Environmental Status Indicators

1. Measurable improvements in trophic status
2. Improved (measurable) ecological or biological indices
3. Improved recruitment classes of targeted fish species/diversity/keystone species
4. Increase in the availability of fishing resources
5. Changes in local community income/social conditions as a result of improvements in environmental conditions

6. Stakeholder awareness raised and involvement documented.
7. Reduction of pollutant concentrations in coastal areas and port zone (heavy metals, persistent organic compounds concentrations, etc.)
8. Relevant coastal habitats rehabilitated
9. Reduced number of threatened species