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Workshop to review the implementation of the Dumping Protocol and its Guidelines

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Report on Dumping Activities in the Mediterranean Sea

for the Period 1995 - 2001

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1 Introduction

1.1 Dumping Activities Regulations in the International Context

The first regional convention on dumping of wastes at sea to be signed was the Oslo Convention, concluded in 1972 by the Countries bordering the North-East Atlantic.

In the same 1972, the Convention on the Prevention of Marine Pollution by Dumping of Wastes and other Matter (London Convention, 1972) was also concluded with the aim of to regulate dumping activities at sea at the global level.

The first concerns regarding the marine pollution in the Mediterranean basin date back to the 1950s, when the main concern was already about pollution by seaborne oil trade[1].

The FAO's General Fisheries Council for the Mediterranean raised further alarm during the following decade when marine pollution was acknowledged as a major threat for fisheries throughout the Mediterranean and, most of all, in the industrialized northwest. It was, however, not until the 70s, after general concerns had been raised about the impacts of pollution on the environment and the consequent holding of the Stockholm Conference and establishment of the UNEP that the Mediterranean States decided to undertake serious efforts to find a solution to control and reduce pollution in their sea.

Following its establishment in 1972, UNEP identified six priority “subject areas” in which to exercise a catalytic and coordinating role. The ocean was one of the six priority areas, due to the increasing recognition of the gravity of marine pollution worldwide. In 1974 UNEP established a Regional Seas Program with the aim of addressing global marine environmental problems within a regional, smaller framework. This was done because UNEP recognized that although marine pollution is a major problem throughout the entire world, specific issues related to marine pollution change from area to area and are more easily addressed locally within the same region.

The Mediterranean basin was identified as priority area and UNEP chose it to develop the Regional seas Programme’s pilot project. The Mediterranean was chosen because of its peculiar characteristics, physically, politically and environmentally. Furthermore, the coastal states were acutely aware of the need to develop some kind of pollution control system[2].
In 1976, during a Conference of Plenipotentiaries convened by UNEP in Barcelona, 16 Mediterranean States and the European Community adopted the Mediterranean Action Plan (MAP). MAP represents the coordinating unit of a very complex system for the protection of the Mediterranean environment.

The year after the Barcelona Conference, the Contracting Parties convened again in Barcelona and concluded the Convention for the Protection of the Mediterranean Sea from Pollution. Simultaneously, they adopted the first two technical protocols, on the Pollution by Dumping from Ships and Aircraft and the Pollution by Oil and other Harmful Substances in case of Emergency. The Convention was intended to be a dynamic legal framework setting out the general principles and obligations of the contracting Parties and indicating to the Parties themselves the areas and issues on which to elaborate and adopt specific sound measures in the form of technical Protocols. The Convention provides the rules of procedure

[1] The first international agreement dealing with marine pollution, the International Convention for the Prevention of Pollution of the Sea by Oil - OILPOL, was concluded in 1954.

[2] The first attempts to find a regional solution for the control of marine pollution in the Mediterranean basin dates back to the late 60s, when the General Fisheries Council for the Mediterranean, concerned by the effects of pollution on the living resources of the sea, asked the member Countries to prepare a regional convention for the protection of the Mediterranean environment against the risks of excessive pollution.

for adopting the Protocols, as well as for solving disputes arising from the implementation of the Convention and of its Protocols by the Parties. The Convention entered into force, together with the two first Protocols, in 1978.

The Barcelona Convention now contains six protocols, five of which are in force. Both the Convention and the Protocols have been significantly amended in recent years, but only the new Protocol on Protected Areas and biological Diversity in the Mediterranean and the Protocol Concerning Co-operation in Combating Pollution of the Mediterranean Sea by Oil and other Harmful Substances in Cases of Emergency have entered into force so far.

The Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft was adopted in Barcelona, Spain, on the 16th of February 1976. Its objective, stated in article 1, was to "to prevent and abate pollution of the Mediterranean Sea area caused by dumping from ships and aircraft". To this end, a list of materials and substances was indicated the dumping of which in the Mediterranean is forbidden. For another list of materials and substances, dumping in the Mediterranean was subject to the issuing of a special permit by the National authority. Article 7 of the Protocol states that the Parties have to send a record of permits to the Coordination Unit of the Mediterranean Action Plan on a yearly basis. All Mediterranean states and the European Community are Party to the Protocol.

The Protocol was significantly amended in Barcelona in 1995, at the same time as the Barcelona Convention. The new Protocol is called Protocol for the Prevention and Elimination of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft or Incineration at Sea. The approach of the amended protocol changes the focus of the regulation from a black list of material for which dumping is forbidden to a general prohibition of dumping in the Mediterranean except for a short list of matters, thereby following the same approach as the London Convention Protocol 1996. For the "permitted" waste, dumping is allowed only after having obtained a special permit. The special permit ought to be given after having taken into consideration the specific biological and natural condition of the dumping area. Incineration at sea is also prohibited, and seabed and sub soil are also included in the general prohibition. Article 7 of the original protocol has been omitted but since article 14.2, stating that the meeting of the Parties shall study the records of the permits, has been maintained, the Parties shall, however, have to communicate to the Secretariat their record if the matter is to be discussed at the meetings of the Parties.[3]
The amended protocol has not yet entered into force. So far, eleven Mediterranean Countries and the European Community have ratified or accepted the amendments. These are Croatia, Cyprus, Egypt, France, Italy, Malta, Monaco, Morocco, Slovenia, Spain and Tunisia.

Also the new Dumping Protocol considers dumping at sea. Article 12 of the Protocol states that a Contracting Parties may report to any other Party concerned of any incidents or conditions in the Mediterranean sea arising suspicions that dumping in contravention of the provisions of the Protocol has occurred or is about to occur.

2 Rationale of the Study

The Contracting Parties to the Barcelona Convention in their 12th meeting, held in 2001 in Monaco, requested to the Secretariat to undertake a comprehensive assessment of the dumping activities in the Mediterranean Sea for the period between 1995-2001. The

[3] The reporting obligations of the European Community and its Member States under the Barcelona system, including the Dumping protocol, has been extensively described by a study requested by the EC Environmental Directorate-General to the European Environmental Agency, published in 2001 as Technical report n. 45, "Guidelines of the EC reporting obligations under the Barcelona Convention and its Protocols in force", EEA, 2001

objective of the study is, in view of the expected entry into force of the revised 1995 Dumping Protocol, to review the status of the compliance with the 1975 Mediterranean Dumping Protocol in the period 1995-2001 on the basis of the information gathered from governmental and other sources.

To this end, a questionnaire was prepared and sent to the Contracting Parties of the Dumping Protocol to collect the necessary information on their dumping activities.
Contacts were made with intergovernmental and non-governmental organisation in order to obtain further information on dumping regulations and activities in the Mediterranean States and to monitor the effectiveness of such regulations.

2.1 Method of Work

2.1.1 Questionnaire

A detailed questionnaire (Survey of National Measures to Regulate and Monitor Dumping Activities under the "Protocol For The Prevention Of Pollution Of The Mediterranean Sea By Dumping From Ships And Aircraft (1976)" in Annex I) for the assessment of dumping activities carried out by the Contracting Parties to the Barcelona Convention in the period 1995-2001 was prepared and submitted to National Authorities in charge. The MED-POL questionnaire takes into consideration legislative, administrative and technical questions related to the Protocol on dumping activities in the Mediterranean Sea.

2.1.2 Review of Scientific and Technical Literature

An extensive review of scientific and technical papers, found both through the World Wide Web and academic and specialised libraries, was carried out. Besides the scientific bibliography, particular attention has been paid to the works of Mediterranean environmental NGOs, including regional offices of worldwide NGOs, such as WWF Mediterranean and Greenpeace and national NGOs particularly concerned with the issue of marine pollution and marine dumping, such as, *inter alia*, the Italian "Legambiente" and "Mare Vivo".

2.1.3 Review of Dumping Reports Submitted by National Authorities to Relevant International Organisations

The database of the London Convention Secretariat was considered in order to find out relevant information.

The dumping reports submitted to the London Dumping Convention by its Contracting Parties in the period 1995-1998 were thoroughly analysed. Furthermore, for comparison, the activities of the OSPAR Commission regarding dumping activities at sea, as well as the OSPAR Commission Annual Reports and technical reports, when deemed relevant to the subject of the assessment, were considered.

Particular attention, as well, was paid to the technical reports produced by the Mediterranean Action Plan, as well as the UNEP reports and the existing dumping reports of the Contracting Parties of the MAP. The relevant technical reports available on the protection of the marine environment, through the Global Program of Action system and GESAMP, also were consulted.

3 State of Dumping in the Mediterranean Sea

3.1 Legal Process

Fourteen Contracting Parties had returned the questionnaire to the MED-POL Secretariat and one (Monaco) had provided relevant information through the submission of a report[4]. From them, however, it is already possible to obtain a significant overview of the way dumping is regulated throughout the Mediterranean. The first, obvious, result is that most Countries have incorporated the Protocol into the national legal system through an *ad hoc* law (Table 1). In this way, the international legislation has been rendered both effective into the national system and elevated to the level of law.

	Implementation by Law	Direct implementation
Algeria	X	
Bosnia and Herzegovina	No legislation related to dumping is yet in place	
Croatia	X	X
Cyprus		X
Egypt	X	
Greece	X	
Israel	X	
Italy	X	
Malta	X	
Morocco		X
Slovenia	X	
Spain	X	
Turkey	No legislation related to dumping is yet in place	

Table 1: Status of Ratification of the Dumping Protocol

Besides the 1975 protocol, Contracting Parties have also ratified several other dumping regulating instruments (Table 2), such as the London Convention 1972 and other international environmental instruments which deal with disposal of waste, such as the Basel Convention, MARPOL 73/78, OSPAR and others, therefore creating an articulated system of permitting and control of dumping.

	International Conventions
Algeria	
Bosnia and Herzegovina	Basel Convention
Croatia	LC 72
Cyprus	LC 72
Egypt	LC 72 and Protocol 96, UNCLOS 82
Greece	LC 72
Israel	
Italy	LC 72

[4] Rapport sur les opérations de dragage et d'immersion des matériaux de dragage effectuées à Monaco dans le cadre de l'extension du Port de la Condamine.

Malta	LC 72
Monaco	LC 72
Morocco	LC 72
Slovenia	LC 72
Spain	LC 72 and OSPAR
Turkey	

Table 2: Other International Agreements Regulating Dumping Activities

Most countries had included into the implementation law the list of materials for which the dumping at sea is to be permitted by the national authority. Among those which answered the questionnaire, two have not as yet legislation in place to address the issue of dumping at sea, while two of those Countries having already ratified the amended Protocol, Cyprus and Slovenia, have declared that their national system already acts upon the provisions of the new Protocol (Table 3).

	Prior Legislation	In Force	In Preparation	No Legislation
Algeria		1988		
Bosnia and Herzegovina				X
Croatia		1994		
Cyprus		2001*		
Egypt		2001		
Greece		1978		
Israel		1984		
Italy		1996		
Malta		1997		
Morocco			X	
Slovenia		2002*		
Spain	X	1992		
Turkey				X

* Amended Protocol

Table 3: Status of Legislation

When not in the implementation law, the identification of the prohibited material is always indicated by an act of a legislative status and therefore, made more stringent (Table 4).

The implementing law usually contains all the details necessary for making the Protocol directly enforceable. All the technical details that are not covered by either the implementing law or a successive law, are listed in the ministerial decree of the Ministry of competence.

	Single Legal Act	Regulation	Administrative Order	Other
Algeria	X			X
Bosnia and Herzegovina	No legislation related to dumping is yet in place			
Croatia	X			
Cyprus	X			
Egypt	X	X		
Greece	X			
Israel		X		

Italy	X			
Malta	X	X		
Morocco	X			
Slovenia	X			
Spain	X			
Turkey	No legislation related to dumping is yet in place			

Table 4: Form of Legislation

3.2 Administrative Process (permitting, enforcement)

Implementation laws, in most cases, do include specific provisions regarding permits and enforcement. When specific provisions are not included in the implementation law, they are however enumerated in another law or legislative instrument. Technical details of the actual issuing of permits are usually left to secondary law instruments or ministerial (administrative) decree (Table 5).

	Identification of Materials			**Identification of Sites**		
	Implementation law	**Separate legal act**	**Administrative act**	**Act of law**	**Administrative regulation**	**Case-by-case**
Algeria	X			X		
Bosnia and Herzegovina	No legislation related to dumping is yet in place					
Croatia		X				X
Cyprus	X			X		
Egypt	X					X
Greece	X					X
Israel	X					X
Italy		X				X
Malta	X				X	
Morocco						
Slovenia						
Spain	X				X	
Turkey	No legislation related to dumping is yet in place					

Table 5: Details Requested by Legislation

The dumping of waste into the sea from vessel or aircraft is regulated in every Country through a fairly strict system (Table 6). Even when permitted, dumping must be carried out with detailed regulations, which are usually indicated in ministerial decree. The norms regulating the permits also indicate the authority in charge of issuing the dumping permit. The national competent authority is either the Ministry of Maritime Affairs or the Ministry of Environment or the Ministry of Transport, depending on which Minister is in charge with the marine medium. In Italy regional authorities are competent too.

	Incineration	**Matters included in Annex II Protocol 1976**	**Matters included in Annex I Protocol 1976**
Algeria			
Bosnia and Herzegovina	No legislation related to dumping in place		
Croatia	X	X	X
Cyprus	X		
Egypt	X	X	X

Greece		X	X
Israel	X	X	
Italy	X	X	X
Malta			
Morocco			
Slovenia	X	X*	
Spain	X	X	
Turkey	No legislation related to dumping is yet in place		

* Dumping of matters except for those listed in the Paragraph 2 of the Article 4. of the Protocol is prohibited. However the general approach to the subject as interpreted by the competent Authority is not to dump any kind of matter at all.

Table 6: Prohibitions

In the majority of Countries submitting the report, the authority in charge of issuing the permits is also the authority responsible for authorising dumping due to *force majeure*. In Egypt, however, there is no provision for the authorisation dumping due to *force majeure*: a ship having carried out dumping due to *force majeure* shall report it to the responsible authority according to international law.
Everywhere legislation is in place for dumping, an authority is designated to keep the record of the permits issued, including the details of the date and method of dumping, the nature and quantity of dumped material and the locations where dumping is permitted. Also in the case of recording the issue of permits, the authority in charge with the record is often, but not always, the same one in charge with the actual issue of the permits. Records are available for consultation at the relevant authority or at the local offices of the maritime authority.

Control and repression are always competence of the coast guard/port authority of the State.

Monitoring and control are carried out with the means at the disposal of the maritime authority and include random inspections, sea and air surveillance and control activities. Penalties are imposed everywhere for unauthorized dumping. They are generally of an administrative nature, amounting to more or less serious fines, but in some countries they can also be criminal penalties, up to a maximum of two years of imprisonment (Table 7).

	Criminal Penalties	**Administrative Fines**
Algeria	X	X
Bosnia and Herzegovina	No legislation related to dumping in place	
Croatia		X
Cyprus	X	X
Egypt	X	X
Greece	X	X
Israel	X	
Italy		X
Malta		X
Morocco		
Slovenia		
Spain		X
Turkey	No legislation related to dumping in place	

Table 7: Penalties

Although in most cases the permits are issued on a case-by-case basis, there still are countries which issue general permits and permits to carry out dumping for a limited period of time (Table 8). Cyprus and Slovenia, which have both ratified the amended Protocol, have declared that since the dumping of all matters is prohibited, the dumping permit system as outlined in the questionnaire with regards to the matters listed in annexes I and II of the 1976 Protocol apply to them only in as far as dumping of both lists of matter is prohibited, except as for special permits determined by the competent authority.

	General	Special
Algeria	X	X
Bosnia and Herzegovina	No legislation related to dumping in place	
Croatia		
Cyprus	X	X
Egypt		X
Greece	X	X
Israel		X
Italy		X
Malta		X
Morocco	X	
Slovenia		X
Spain		X
Turkey	No legislation related to dumping is yet in place	

Table 8: Permits

3.3 Dumping Activities

3.3.1 National Reports on Permits Issued

Fourteen national authorities gave answers to the MED-POL dumping questionnaire: Algeria, Bosnia and Herzegovina, Croatia, Cyprus, Egypt, Greece, Italy, Israel, Malta, Monaco, Morocco, Slovenia, Spain and Turkey. Monaco submitted a report about dredging activities carried out in 1999 at Port de la Condamine.

Data were acquired, also, from the final report on permits issued by the Contracting Parties to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention, 1972) circulated by the Secretariat of the Convention. The reports on dumping and incineration at sea are submitted to the Secretariat of the London Convention 1972 by the Contracting Parties directly or through regional bodies responsible for implementing instruments related to dumping or incineration of wastes at sea.

The following Mediterranean Contracting Parties to the London Convention 1972 have provided reports in the considered period: Croatia, Cyprus, Egypt, France, Greece, Italy, Monaco, Morocco, Slovenia and Spain. Among these parties, in the 1995 - 1999 period, only Italy and Monaco have informed the LC Secretariat on permitted dumping activities, respectively of dredged material and vessel, in the Mediterranean Sea (Tab. 9).

	1995	1996	1997	1998	1999	2000	2001
Croatia	X						
Cyprus	NIL	NIL	NIL	NIL			
Egypt	NIL	NIL	NIL	NIL	NIL	X	X
France*				32	33		
Greece	NIL		X	NIL	NIL	X	X

Italy	24**	X	X			X	X
Monaco	NIL			NIL	1***	X	X
Morocco	NIL	NIL	NIL				
Slovenia	NIL	NIL	NIL	NIL	NIL	X	X
Spain*	8	7	9	8	8	X	X

* Report about dumping activities not carried out in the Mediterranean Sea
X: Details not yet available
** 5,228,210 tonnes d.w. of dredged material
*** One special permit for a small vessel

Table 9: Dumping permits declared by Mediterranean Contracting Parties to the London Convention 1972

A comparison between the dumping activities reported by the LC Secretariat with the ones reported by the Contracting Parties to the Barcelona Convention also through the MED-POL questionnaire (Table 10), shows discrepancies both in the quantity and quality of the reported data.

	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**
Algeria°	NIL	NIL	1*	1**	1**	NIL	3**
Croatia	NIL	NIL	NIL	NIL	1*+1***	NIL	NIL
Cyprus	NIL	NIL	NIL	NIL	NIL	NIL	NIL
Egypt	X	X	X	X	X	X	X
Greece	NIL	NIL	NIL	NIL	NIL	NIL	NIL
Israel°	78[§]						
Italy	24****	28****	21****	X	X	1*+6****	12****
Malta						2[#]	2[#]+1[##]
Monaco	NIL			NIL		1*****	NIL
Morocco	NIL	NIL	NIL				
Slovenia	NIL	NIL	NIL	NIL	NIL	NIL	NIL
Spain				140*	88*	80*+5[x]	76*+5[x]

° Not Contracting Party to the London Convention, 1972
°° Report about dumping activities not carried out in the Mediterranean Sea
[§] Total number of dumping permits released along the entire period for various categories of material

X No details provided
* Vessels

** '98: 3,700 m^3 of dredged mat.; '99: 25,000 m^3 of dredged mat.; '01: 701,853 m^3 of dredged mat.
*** '99: 610,000 m^3 of dredged mat.
**** '95: 1,791,700 m^3 of dredged mat. + 2,230,000 m^3 for beach nourishment; '96: 1,707,700 m^3 of dredged mat.; '97: 1,963,000 m^3 of dredged mat.; '00: 199,250 m^3 of dredged mat.; '01: 383,500 m^3 of dredged mat.
[#] Quantity of dredged mat. expressed as 18 "hopper barges"; [##] Quantity of inert inorganic geological materials expressed as 3 "hopper barges" per day.
***** 137,050 m^3 of dredged mat.
[x] Dumping permits for dredged materials, no details provided.

Table 10: Dumping permits declared by Contracting Parties to the Barcelona Convention

Following information on permits issued in the considered period (1995 -2001) were submitted from Contracting Parties to the Protocol through the questionnaire:

Algeria

Year	**1997**				**1998**				**1999**				**2000**				**2001**			
Trimesters	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Vessels		**x**																		
Dredged Mat. (m^3 x 1,000)					**3.7**							**25**					**177.960**		**370.893 + 153.000**	

Reported that permits were issued for:

- vessels: 1 permit issued on 03/06/1997[5].
- Dredged material: 5 permits[6] issued in 1998 (3,700 m^3 dumped at sea from 45,000 m^3), for the period December 1999 - July 2000 (25,000 m^3), for the 1st and the 2nd trimesters 2001 (177,960 m^3), for the 2nd and the 3rd trimesters 2001 (370,893 m^3) and in September 2001 (153,000 m^3).

Bosnia-Herzegovina

No legislation related to dumping is yet in place. No data provided.

Croatia

Year	**1999**			
Trimesters	**I**	**II**	**III**	**IV**
Vessels	**1**			
Dredged Mat. (m^3 x 1,000)	**610**			

Reported that permits were issued for:

- vessels: 1 permit issued in 1999.
- Dredged material: 1 permit issued in 1999 for 610,000 m^3.
- War surplus: in the period 1992 – 1995 there were few incidents with dumped war material but due to the war situation, the type and amount of materials is not possible to determine.

Cyprus

Reported that a permit was issued on March the 6th 2002 for 14.000 m^3 of dredged material to be dumped in two months. No data have been submitted for the enquired period apparently because legislation is in force only since October 2001.

Egypt

Permit(s) was (were) issued for dredged material but no details are provided.

Greece

Reported that permits were not issued in the period 1995 – 2001.

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[5] In the answers to the questionnaire, four permits are cited; one is referred above, two were issued in year 2002 (15/04/2002 and 06/02/2002) and no details were provided for the fourth. It is explicitly stated that noxious products and oil and bunker residuals were removed from the wrecks before sea dumping.

[6] Two more permits were issued in June 2002 (no data about quantity) and on 18/07/2002 for 1,490,000 m^3.

Israel

Year	1995				1996				1997				1998			
Trimesters	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Organohalogen and organosilicon	X															
Hg and Cd (m^3 x 1,000)	270															
Acid and alkaline (m^3 x 1,000)	132															
Fluorides	X															
As, Pb, Cu, Zn, Be, Cr, Ni, Va, Se, Sb, and their compounds	X															
Scrap metal and remains of grounded ship												X				
Vessels	12 permits															
Dredged Mat.	40 permits															
Organic materials of natural origins	9 permits (~600m^3 per week)															
Fish waste or organic materials resulting from the processing of fish and other marine organisms	6 permits (~300m^3 per week)															
Other	Desalination brines, treated metal plating waste brines, 2 permits															

Year	1999	2000	2001
Vessels	12 permits (cont.)		
Dredged Mat.	40 permits (cont.)		
Organic materials of natural origins	9 permits (~600m^3 per week) (cont.)		
Fish waste or organic materials resulting from the processing of fish and other marine organisms	6 permits (~300m^3 per week) (cont.)		
Other	Desalination brines, treated metal plating waste brines, 2 permits (cont.)		

Reported that permits were issued for:

- organohalogen and organosilicon compounds in the period January 1995 – December 1998.
- Mercury and cadmium compounds: 270,000 m^3 in the period January 1995 – December 1998.
- Acid and alkaline compounds: 132,000 m^3 in the period January 1995 – December 1998.
- Fluorides in the period January 1995 – December 1998.
- Arsenic, lead, copper, zinc, beryllium, chromium, nickel, vanadium, selenium, antimony and their compounds in the period January 1995 – December 1998.
- Containers, scrap metal and other bulky wastes: in December 1997 scrap metal and remains of a grounded ship were dumped.

- Vessels, platforms and other man-made structures at sea: 12 permits between 1995 and 2001 were issued for dumping of vessels to serve as artificial reefs and diving sites.
- Dredged material: 40 different permits for dredged material mostly from Haifa & Kishon port.
- Organic materials of natural origins: 9 permits for cheese whey and milk.
- Fish waste or organic materials resulting from the processing of fish and other marine organisms: 6 permits. ~300m^3 per week.
- Other categories not included above: desalination brines, treated metal plating waste brines, 2 permits.

Italy

Year	1995				1996				1997				1998			
Trimesters	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Dredged Mat. (m^3 x 1,000)					988	211.7	363	160	141	1280.8	389.2	178				
Fish waste	No authorization needed															
Sludge (m3x1000)					466700 +*1106000*				1263200+*1790000*							

Year	1999				2000				2001			
Trimesters	I	II	III	IV	I	II	III	IV	I	II	III	IV
Vessels					1 wooden vessel (temporary)							
Dredged Mat. (m^3 x 1,000)					50	55	92.5	1.75	56	102.5	10	215
Fish waste	No authorization needed											

Reported that permits were issued for:

- vessels, platforms and other man-made structures at sea: 1 wooden vessel in year 2000. Temporary permit, vessel to be removed after experiment.
- dredged material: 74 permits (data available only for 1996, 1997, 2000, 2001).
- fish waste or organic materials resulting from the processing of fish and other marine organisms do not need authorization for dumping at sea.
- sludge: quantity in *italic contains trace metals and organics(only 1996-1997)*

Malta

Year	2000				2001			
Trimesters	I	II	III	IV	I	II	III	IV
Dredged Mat.	2 hopper barges				1 hopper barge	15 hopper barges		
Inert inorganic geological materials						3 hopper barges/day		

Reported that permits were issued for:

- dredged material: 18[7] hopper barges (no data about quantity) in the period February 2000 – May 2001.
- Inert inorganic geological materials: 3 barges per day in May 2001.

[7] One more hopper barge of dredged material was dumped in March 2002.

Monaco

Year	2000			
Trimesters	I	II	III	IV
Dredged Mat. (m^3)	137,050			

Data acquired from a report about dredging activities carried out in 1999 at Port de la Condamine.

Morocco
No data were provided for the enquired period apparently because legislation is not yet in force.

Slovenia
Reported that no permits were issued in the considered period.

Spain

Year	1998				1999				2000				2001			
Trimesters					I	II	III	IV	I	II	III	IV	I	II	III	IV
Vessels	140 permits				88 permits				80 permits				76 permits			
Dredged Mat.									5 permits				5 permits			

Reported that permits were issued for:

- vessels, platforms and other man-made structures at sea: 140 permits in 1998, 88 permits in 1999, 80 permits in 2000 and 76 permits in 2001.
- dredged material: 5 permits in 2000 and 5 permits in 2001. No details about quantities.

Turkey
No data were provided for the enquired period because not available, apparently because legislation is not yet in force.

3.3.2 Competent National Authorities for issuing of Dumping Permits and for Monitoring Dumping Activities
(e-mail addresses refer to the Person in charge for the information provided within the questionnaire)

Algeria	Ministère de l'aménagement du territoire et de l'environnement Ministère de la défense national Ministère du transport
Bosnia-Herzegovina	Secretary of MAP Office for B&H map.office@heis.com.ba
Croatia	Marine and Coastal Protection Unit of Ministry of Environmental Protection and Physical Planning Ministry of Maritime Affairs, Transport and Communications margita.mastrovic@mzopu.hr
Cyprus	Ministry of Agriculture Natural Resources and Environment Department of Fisheries and Marine Research lloizides@cytanet.com.cy
Egypt	Ministry of Transport - Maritime Transport Sector Suez Canal Authority – Oil Ministry – Maritime forces mmt@idsc.net.eg
Greece	International Affairs Unit of the Marine Environment Protection Division Ministry of Environment, Physical Planning and Public Works

	dpthap@mail.yen.gr
Israel	Ministry of the Environment, Marine and coastal Environment Division gidib@sviva.gov.il
Italy	Ministry of Environment - *Servizio Difesa Mare* Local Maritime Authorities Barbera.Carla@minambiente.it Valentini.Marco@minambiente.it
Malta	Malta Environment and Planning Authority Environment Protection Directorate henriette.debono@mepa.org.mt
Morocco	Ministère de l'Equipement et du Transport Ministère des Pêches Maritimes
Slovenia	Ministry of the Environment, Spatial Planning and Energy Ministry of Transport cermelj@mbss.org
Spain	Maritime Pollution Dept. General Directorate of the Ministry of Merchant Marine Local Maritime Authorities fjvillanueva@mfom.es

3.3.3 The role of Mediterranean NGOs

Several environmental Non Governmental Organizations (NGOs) exist in the Mediterranean dealing with all aspects of marine environmental protection. Their activities, however, rarely result in report or documents giving a comprehensive overview of their perception of the environmental impact of dumping activities in the Mediterranean Sea.

Studies and reports on dumping indicate, with various degrees of details, the level of danger caused by indiscriminate dumping, focusing on or for the meetings of international organisation but not at the Mediterranean level.

However, many press releases and declaration by the various NGOs, show how the threat of uncontrolled dumping activities is felt and fought as possible. NGOs have also maintained a high level of attention on the problems annexed to the lack of practical control over dumping activities.

Significant, from this point of view, is the activity of Greenpeace Mediterranean, which, like its international counterpart does at the ocean level, maintains a keen eye on Mediterranean countries. From its activities in the past decades, Greenpeace has shown how several Mediterranean Countries had acted not in conformity with the dictates of the Barcelona Convention and of the dumping protocol in particular.[8, 9] However, while many efforts in this field, both through the media and through technical reports, have been carried out in other areas, such as, in particular, in the North Sea, for the Mediterranean Sea the attention of

[8] An overview of the activities of Greenpeace in the field of ocean dumping is at the URL http://archive.greenpeace.org/~odumping/.
See also the article "Greenpeace and the dumping of wastes at sea: a case of non-state actors", by Rémi Parmentier, Head of Greenpeace International's Political Unit, originally appeared in International Negotiation, vol. 4, no. 3 (1999), Kluwer Law International, available on the URL www.greenpeace.org/~odumping/radioactive/ reports/odhistory.pdf. The article summarise twenty years of campaigning of Greenpeace in the field of marine and ocean dumping.

[9] See for instance, the Greenpeace campaign to halt dumping of toxic waste off the coasts of Israel carried out in the period 1997-1998: http://www.greenpeacemed.org.mt

NGOs is more focused on the transboundary movement of hazardous wastes and the seaborne trade of HNS rather than at sea dumping activities.

3.3.4 Illicit, Unregulated and Unreported Dumping Activities

In the Mediterranean Sea cases of illicit, unregulated and unreported dumping activities occur. The last category is the most evident because the presence of dumped ammunitions and obsolete ordnance on the seabed is, sometime, mapped on nautical charts.

To be noted is that the reporting of dumping of obsolete ordnance is not only non mandatory under the London Convention nor it is specifically considered in the Dumping Protocol of the Barcelona Convention. Furthermore, it is often not known by the authorities in charge with the reporting, since the dumping of ordnance is carried out by the national military authorities. The exchange of information between the military and civilian administrations, whether environmental or transport authorities, is not often either regular or normally envisioned, therefore no information can be easily gathered regarding the dumping of military ordnance in the Mediterranean Sea.

The dumping at sea, at least until the seventies, was considered worldwide the best available solution for the disposal of useless ammunition and obsolete ordnance. Million of tons of war material of any sort has been dumped throughout the years and now lies on the ocean and sea floors of the entire world. Large quantities date back to WW II but in the following years ammunitions have been dumped as well because useless or obsolete or in order to allow the safe landing of military planes. These ordnances rust in salt-water releasing pollutants in the marine environment and can even get caught in fishing gears.

This practice was applied also to chemical weapons (CWs) whose quantity dumped at sea is thought to be about three times larger than the chemical arsenals of Russia and the United States[10] before the entry into force of the CWC (Chemical Weapons Convention, 1997)[11]. Dumping operations regarding CWs have been carried out mainly in areas of the Baltic Sea, the North Sea, the Sea of Japan, the North Atlantic Ocean, the South Pacific Ocean and the Mediterranean Sea. In the Southern Adriatic Sea, in particular, after WW II war surplus and ordnance brought up from navy wrecks sunk in Apulian ports and harbours and resulting from clean-up activities and from stores and productions units were regularly dumped at sea, the dumping sites chosen on criteria as depth and distance from the coasts. In several cases there are no data available concerning the sites and about quality and nature of the dumped ordnance, in some cases the areas in which dumping operations were carried out are reported on the nautical charts as “unexploded ordnance” dumping zones. Dumped CWs in the Southern Adriatic Sea are in such a quantity as to be an actual danger for those who fish and explores the seabed. More than two hundred fishermen, between 1946 and 1996, have been hospitalised after being exposed to chemical warfare agents (CWAs) leaked by war residual caught in their trawl nets[12], [13].

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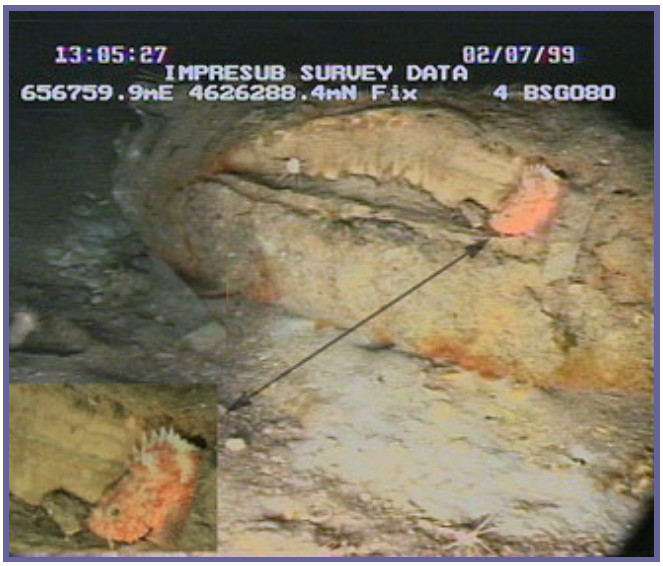
[10] Hogedoorn E. J., 1997. A chemical weapons atlas. *The Bullettin of Atomic Scientists*. Vol. 53 (**5**). http://www.bullatomsci.org/issues/1997/so97/so97/chepesiuk.html

[11] Chemical Weapons Convention (CWC): Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on their Destruction, opened for signature in January 1993, entered into force on 29 April 1997.

[12] Assennato G., Ambrosi F., Sivo D., 1996. Possibili effetti a lungo termine sull’apparato respiratorio della esposizione ad iprite tra pescatori. *La Medicina del Lavoro*, **88** n° 2.

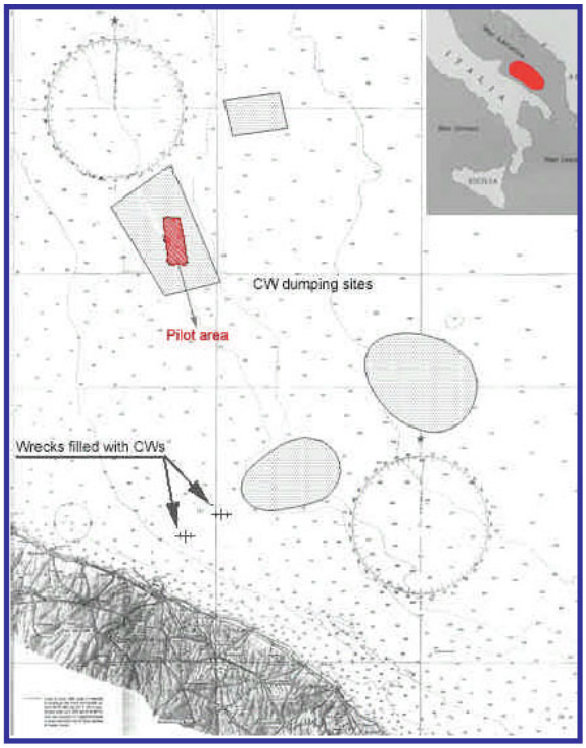
[13] Mastrorilli A., 1958. Esiti a distanza di lesioni di vescicatori. Revisione clinico-statistica su 102 casi. *Giornale di Medicina Militare*, fasc. **4**: 352-361.



***Helicolenus d. dactylopterus* (Delaroche, 1809) in the fracture of a rusted chemical bomb**.

After several parliamentary requests to the competent Italian Ministries, the Italian Ministry of the Environment promoted the publication of a handbook illustrating precautionary measures suggested to fishing boats crews operating in Southern Adriatic Sea[14] and ordered a pilot study for the survey and sampling of dumping sites in the Adriatic Sea. To this end, ICRAM, the Italian central institute for applied marine research, between 1997 and 1999 has carried out a research project, named A.C.A.B. (*Armi Chimiche Affondate e Benthos* = dumped chemical weapons and benthos)[15], to identify CWs dumping sites in the Southern Adriatic Sea, to evaluate the state of the bomb shells and to assess the possible environmental risk related to the noxiousness and persistence of CWAs. Following a multidisciplinary approach, marine universities, military technical centres, historians and oceanographic engineering companies joined the project.

Through the study of civilian and military archives four different dumping sites were identified in the Southern Adriatic Sea at depths in the range of 150 ÷ 1000 m. Within one of these sites, a ten square nautical miles area of the seafloor was chosen and a survey was carried out (see map).



Data obtained by means of side scan sonar, magnetometer and sub bottom profiler allowed the mapping of more than one hundred targets in the pilot area. Among the sixteen targets that were possible to observe through a remotely operated vehicle, nine aerial and two artillery chemical bombs were recognized. In three cases, the CWAs contained in the rusted shells were clearly visible both from holes and fractures of the bomb body, as well as on the surrounding seafloor.

Samples of water, sediment and dwelling fish tissues were collected close to the detected bombs and in reference sites, two areas located in

[14] Amato E., Alcaro L., 2001. Manuale illustrativo delle misure precauzionali da adottare in caso di salpamento di residuati bellici mediante reti da traino. Con particolare riferimento a quelli a “caricamento speciale” affondati nel Basso Adriatico. *ICRAM for the Italian Ministry of Environment*. 42 pp.

[15] Amato E., Alcaro L., 1999. A.C.A.B. Armi Chimiche Affondate e Benthos. Residuati bellici caricati con aggressivi chimici affondati in Basso Adriatico: distribuzione, stato di conservazione e conseguenze per gli ecosistemi marini. Final report, 2 volumes, 225 pages and 28 annexes. *ICRAM for the Italian Ministry of Environment*.

Southern Tyrrhenian Sea (Sicily) supposed to be unaffected by the dumping of war material. Analyses were carried out (histological, GC/MS, Microtox®, biomarkers, arsenic contamination) in order to test the toxicity of compounds such as yperite, lewisite and their hydrolysis products.

Bis-(2-chloroethyl)sulphide (Cl-CH2CH2-S-CH2CH2-Cl), a CWA commonly known as "mustard gas" or yperite ("H", Levinstein process) and dichloro-(2-chlorovinyl)arsine (Cl-CH=CH-As(Cl)2) ("lewisite"), are among the twenty-four different CWAs that were contained in the bombs, grenades and drums dumped in South Adriatic Sea. Eighteen of these compounds pose major risks to the concerned benthic ecosystems because their physical-chemical properties make their noxiousness persistent in seawater. Hydrolysis products, such as 2-chlorovinylarsenious acid (Cl-CH=CH-As(OH)2) and 2-chlorovinylarsenious oxide (Cl-CH=CH-As=O) from lewisite, have shown to be even more toxic than their parent products[16, 17].

The analyses carried out on the sediment samples collected near to the ordnances showed the presence of several hydrolysis products of yperite. Yperite, lewisite and their oxidation and hydrolysis products were not detected in fish tissues.

Samples of muscle and gills of demersal fish[18] analysed to detect traces of arsenic by means of AAS, showed, for the pilot area, significantly higher values than the ones found in the same species collected from the reference site and higher than the MPC (Maximum Permissible Concentration)[19] established in some countries whose values are in the range 0.1 to 6 ppm d.w..

Microtox®acute toxicity tests were applied to sediment and water samples collected near to the ordnance showing bio toxicity, both in the solid phase and in the interstitial water, in some of the samples. Liver samples of *Conger conger* (Linnaeus 1758)*, Helicolenus d. dactylopterus* (Delaroche, 1809)*, Raja asterias* Delaroche, 1809*, Raja clavata* Linnaeus 1758*,Trigla lyra* Linnaeus, 1758 and *Trigla lucerna* Linnaeus, 1758 were analysed to measure the induction of CYP-450 1A (EROD, 7-ethoxyresorufin-O-deethylase) and the inhibition of Acetyl cholinesterase activity was measured in samples of brain (AchE b) and muscle (AchE m).

In *Helicolenus d. dactylopterus* EROD values obtained from individuals caught in the pilot area showed a 50% increase of activity compared to the controls. Both the enzyme activity involved in detoxifying processes in liver tissues (EROD) and the physiological activity of enzymes in brain and muscle tissues (AChE) of individuals collected in the pilot area showed significant differences ($p<0.05$) compared to the controls values.

A Health Assessment Index (HAI)[20] was assigned to each collected individual according to the number of macroscopic alterations observed. Fifteen out of sixteen individuals of

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[16] Goldman M., Dacre J.C., 1989. Lewisite: its chemistry, toxicology and biological effects. *Rev. Environ. Contam. Toxicol*., **110**: 75-115.

[17] Mitretek System 1999. Chemistry of L (Lewisite) www.mitretek.com/mission/evene/chemical/agents/lewisite.html.

[18] *Conger conger* (Linnaeus, 1758)*, Helicolenus d. dactylopterus* (Delaroche, 1809)*, Raja asterias* Delaroche, 1809*, Raja clavata* Linnaeus, 1758*, Trigla lyra* Linnaeus, 1758 and *Trigla lucerna* Linnaeus, 1758.

[19] Nauen C.E., 1983. Compilation of legal limits for hazardous substances in fish and fishery products. *FAO Fisheries Circular 764*. *Food and Agriculture Organization of the United Nations. Roma*.

[20] Adams S.M., Brown A.M., Goede R.W., 1993. A quantitative health assessment index for rapid evaluation offish condition in the field. *Transaction of the American Fish. Soc.* **122**: 63-73.

Helicolenus d. dactylopterus were counted as damaged whilst in the control site only eleven out of twenty one specimens of *H. dactylopterus* showed significant macroscopic alterations. Hystopatological analyses performed on livers and spleens of the same fish revealed evident damages (steatosis, fibrosis, granuloma and atrophy of lymphatic centres) in liver and spleen tissues of sixteen out of eighteen *H. dactylopterus* individuals analysed.

The overall results indicate that the leakage of CWAs from the rusted bombshells is likely to produce negative effects on the concerned benthic ecosystem. Although yperite and its degradation products have been detected only in a few sediment samples, demersal species collected close to the bombs seem to be affected by pollutants. Not only histological lesions or macroscopic damages but also arsenic concentration and enzyme activities have put in evidence the worst status of health of specimen collected within the dumping area.

The results of the A.C.A.B. project validated the public interest in the matter and showed the need for further intervention and surveys. The data obtained and the surveys carried out during the project, though substantiating the worries regarding the extent and the ecological importance of the pollution, must be considered as preliminary results and in need of further studies. At the present, in fact, worldwide scientific studies about the ecological effects of ordnance dumping are scarce and often had obtained only partial and uncertain results. The reason for such delay is to be found in the fact that:

• the subject has been considered in international *fora* only in the recent past, and
• objective difficulties do exist in carrying out field and laboratory operations in safety conditions for the personnel performing such experiments and therefore, *ad hoc* safety systems and infrastructure must be set up beforehand[21].

Several initiatives have been carried out in the last few years at the international level. NATO recognised, in its 1996 report “NATO and Partner Countries Study Defence-Related Radioactive and Chemical Contamination”, referring mostly to the Atlantic Ocean and the Baltic Sea, that the existence of chemical warfare agents in the seabed of the Member Countries poses a serious threat to those involved in fishing activities near the contaminated areas and that the exact quantity of those dumped ordnance is still to be determined.

As regards conventional weapons dumped in the Mediterranean Sea, the scientific literature reports the harmfulness to the marine biota of the explosives (mainly TNT) and the bombs dumped at sea during the Kosovo conflict, such as the cluster ones, have caused the injuring of some Italian fishermen as well as the temporary closure of wide fishing grounds in Central Adriatic Sea. Despite the clean-up operations carried out by the NATO and Italian minesweeper fleets at depths not exceeding 300 meters, as a result of improvements in trawling fishing techniques and equipment, depths of one thousand meters are likely to become easily affordable for fishermen, thus exposing them to the additional risks represented by the new and old explosive devices that lie on deep bottoms.

The European Union has recognised, in the Decision n° 2850/2000/EC of the European Parliament and the Council of 20 December 2000, setting up a Community framework for cooperation in the field of accidental or deliberate marine pollution, the need for Member States to cooperate in protecting environment and human health from accidental and deliberate pollution from harmful substances including dumped ammunitions. In April 2001, at the meeting of the Ministers of the Environment of the Adriatic and Ionian Sea held in

[21] Murubi M., 1997. Toxicity of mustard gas and two arsenic based chemical warfare agents on *Daphnia magna* for the evaluation of the ecotoxicological risk of the dumped chemical warfare agents in the Baltic Sea. *Fœrscarets Forskningsanstalt, Umea (Sweden). Avedelningen fœr NBC Skydd.* Report n. FOA-R-7-430-222-SE, 33 pp.

Ancona, Italy, the Ministers acknowledged that the problems, which arise from the ordnance dumped in an ecologically sensitive heavy populated sea basin, is a major concern of all the coastal States and wishing to face the financial, scientific and technological challenges arising from the presence of such dumped ammunition would welcome the establishment of a scientific and technical sub-Regional forum to internationally discuss the issue.

About illicit dumping operations, the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention, 1972) as well as other Multilateral Environmental Agreements, prohibits the disposal at sea of radioactive wastes and other nuclear materials, even if materials containing less than *de minimis* levels of specific ionizing activity, could be disposed. Somewhere, sometimes, it is not a *de minimis* problem: in some regional areas the problem of the dumping seems related with relevant military and political issues. Concerning the dumping of radioactive waste in the Mediterranean Sea it is important to underline the links between the illegal traffic of radioactive slags and military infrastructures as well as the nuclear technology proliferation activities performed for years by several countries. Many countries managed their radiological issues in respect of their own State interest without any compliance of existing MEAs.

In this scenario the Italian Government, in support of the Public Prosecutor Office of Reggio Calabria and other judicial authorities started in the 1996 some investigations about the sinking of some ships with radioactive waste cargo near the Italian coastline between the 80's and the 1995.

The voluntary sinking of several ships with nuclear materials was demonstrated by the Special Research Monitoring Center and by the Environmental Crime Prevention Program (US based international organizations); IMO, IAEA, NATO, UNEP, EU, UNESCO and other organizations supported the studies and the investigations.

Some dumping area were identified in Italy (deep canyons near the coasts, characterized by some complex geomorphologic phenomenon). The links between illicit dumping and organized crime activities were demonstrated. A national and international inquiry (P.P. 2114\94) of the Procura Circondariale Reggio Calabria, supported by the Italian Ministry of Foreign Affairs, in order to investigate about alleged illicit traffic of nuclear waste from eastern Europe and other countries and dumped in Italian national sea (Ionian, Adriatic, Tyrrhenian) demonstrated that about 45 ships loaded with radioactive slags including uranium, plutonium 238, 239, 240, iodine 129, 131, cesium 137, strontium 90 are reported to be laying on the bottom of the Mediterranean Sea and according to definite evidence the contents are already polluting the environment and treating environmental national security.

At the end of the '90s some intelligence analysis by the security services (SISMI, SISDE) and a general scientific investigations by the Italian National Environmental Protection Agency (ANPA), were performed without any results and some other central judicial authorities (DNA) were charged of the issue without any further progress in the investigations.

The Environmental Crime Prevention Program (an intergovernmental organization chaired by US EPA and linked with UNEP, IMO and IAEA) is still monitoring the "radiological emergency on international scale" as the described issue was qualified in 1996 by the international community.