SEVENTH FRAMEWORK PROGRAMME

Monitoring and Evaluation of Spatially Managed Areas

Deliverable 3.3

Applicability of Framework

Part VI: 1st run application of Strait of Sicily Case Study

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What can the MESMA framework deliver for the case studies?

With the help of a few standardised questions each case study can assess how the MESMA framework is used for the particular case and what the expected outcomes are:

i) Give a brief (150 words) description of the case study highlighting the main issues regarding its spatial management

The Strait of Sicily is defined as the part of the Central Mediterranean Sea comprised between the international waters off the African coast, the southern coast of Sicily, and the waters surrounding the Maltese archipelago. It roughly coincides with the FAO GSAs 15 and 16, except in the fact that the Egadi Islands are completely incorporated in the study area for the MESMA purposes. Such definition embraces an area characterized by high seas with sprinkle small islands, unique oceanographic features, large habitat heterogeneity, huge (beta)diversity, exceptionally high productivity, and a massive cultural heritage. The entire area holds the homelands of very different human populations which heavily exploit a vast array of marine resources from ancient times. As a result of the lack of an unified policy among nations and sectors, Sicily inherits a complex composite of conflicts among different uses of the marine realm at several spatial and temporal scales.

ii) Describe the relative position of the case study within the scheme below (see detailed description in D2.1):

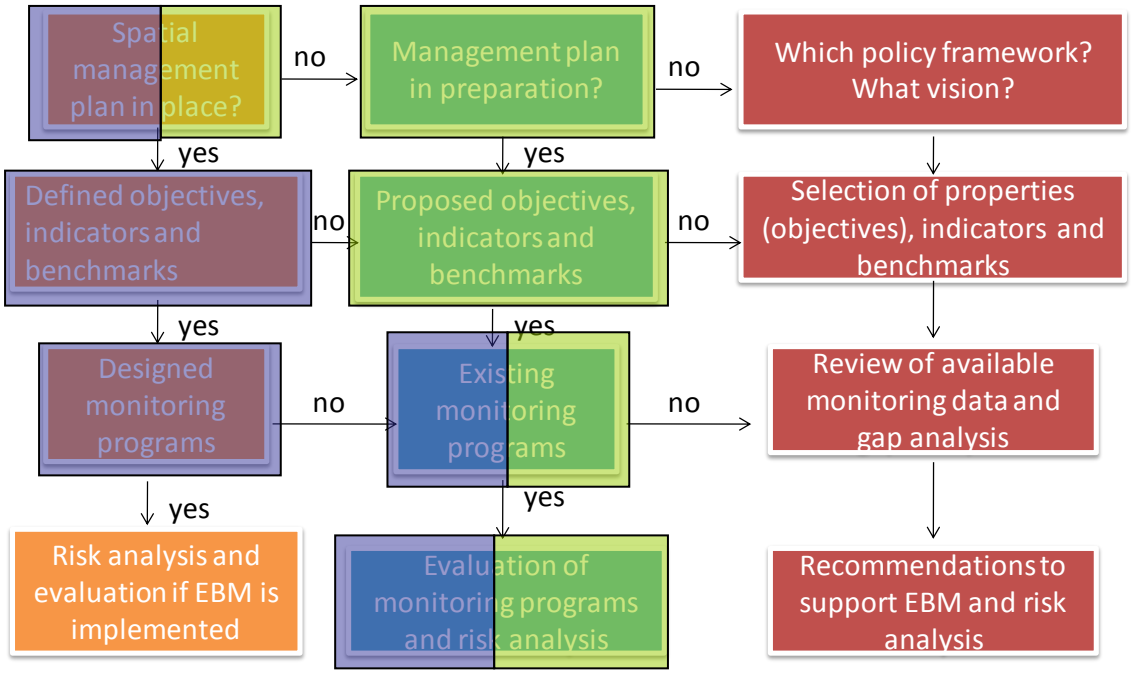


Figure 2: **Conceptual flow diagram which relates the maturity of a given spatial management in a SMA together with the available data to expected assessment outcomes. Blue boxes identify the position of the CS regarding conservation , whereas green boxes represent the position for fisheries.**

There is not any unified spatial management plan. There are, however, sectoral management plans at different level of development. For the MESMA purposes, this CS will focus on fisheries and conservation, since (1) these activities fully interact with any other use of the territory; (2) both CNR and MRRA held

data about these issues; and (3) these are the issues mainly tackled by the rest of CS within MESMA, which allow for inter-CS comparisons. While there is a defined management plan for fisheries, there is currently not a counterpart for conservation aspects. Therefore we will implement the MESMA framework at two levels of data definition (or reciprocally, data uncertainty).

Fisheries. Malta stands in the middle of the flow chart while Sicily is somewhat more to the right in some aspects.. For EU countries, there are national management plans in place with well defined objectives and indicators but lacking proper benchmarks [1], African countries can provide analogous or incongruous management measures [2]; some monitoring programs are already in place, covering the entire area since some years (e.g. Medits); we currently lack information about risk analysis in the study area. Gaps and recommendations are identified.

Conservation. Sicily is placed in the middle of the flow chart but goes quickly to the right. A management plan for Special Areas for Conservation (SACs) is in preparation, but operational objectives have not been defined. Monitoring programs are starting to be implemented in coastal waters around Sicily, but there are possible flaws regarding representativeness. Gaps and recommendations are identified.On the other hand, Malta is placed in the middle of the flow chart. A management plan for Special Areas for Conservation is in preparation for one of the SAC's and must be completed by 2014. Whereas for the other four proposed areas, this period has not yet commenced. There are some existing monitoring programs such as the Integrated Coastal Zone Management (ICZM) in two bays (Ghajn Tuffieha and Ramla Bay) where both are part of the SAC's. These are being managed by GAIA Foundation in collaboration with MEPA and MRRA. Moreover, there are also 'Conservation areas around wrecks' where fishing in prohibited all year round and also the 'Protection of Yelkouan Shearwater' located in the NE of Malta where fishing activities using strong lights are prohibited between the beginning of February and the end of July. These are being managed by Transport Malta and AFM.

[1] There is not a baseline or reference level for fisheries in the study area, since it is not possible to find a near-pristine status of the environment in relation with this activity in the whole Mediterranean Sea after millennia of traditional fishing. The situation is further confused after the industrialization of the fishing fleets in the '60s. It can be estimated that an entire trophic level has been removed from marine coastal food webs during the last decades (e.g. seals, groupers). Additionally there is mounting evidence of vanishing complexity within basal trophic levels (e.g. disappearance of *Cystoseira* species following coastal urbanization). An analogous trend seem to occur in pelagic food webs, were top predators (large tuna, swordfish, sharks, toothed cetaceans) are becoming rare and functionally extinct.

[2] African countries are present in pan-Mediterranean organizations giving advice on management like the FAO-GCFM. However, conflicting decisions still arise (e.g. Mamellone between Italy and Tunisia).

iii) How will the MESMA framework be used for the case study?

- The framework will allow to get a general view of the present activities, stakeholders and governance in the case study
- Its outcomes will help in the decision process for establishing the Marine Strategy Framework Directive.
- Will be useful when distributed among stakeholders in order to generate new links between them and stimulate a management plan

iv) What are the expected outcomes of the application of the MESMA framework?

- Better communication, cooperation and also better management of data between different government entities as these would have been consulted during the implementation of the framework
- Identification of all the existing measurements already in place in the Case study area
- Identification of all the conflicts between present activities and measurements and also identification of conflicts between different stakeholders,

- The results obtained from this framework will contribute to the design of the marine spatial plan
- convey specific recommendations from the local idiosyncrasy to policy makers

Step by step guidance on the application of the generic framework

Step 1 Context setting

Step 1a and 1b should be carried out together. Both steps take different pieces information from existing sources which are then filled out in the subsequent actions to set the context for the evaluation to be carried on throughout the manual.

Step 1a: Set temporal and spatial boundaries for SMA assessment

The aim of step 1 is to set the spatial and temporal context for the framework evaluation (1a) and to define the goals and operational objectives (1b). **Both steps are carried out in conjunction** and between them they should set the context for the physical area involved as well as the overarching aims of the SMA. Having decided which goal/objective will be the focus of the MESMA framework, the boundaries will often be specified in the relevant legal and policy documents and these should be the boundaries that are used in the MESMA case study research, recognising that these boundaries may themselves be a focus for disputes. The delimitation of these boundaries may be based on biogeographic or political boundaries and as such could influence disputes as well as influencing the potential to achieve conservation objectives. This way the case study research is based on actual, real policy initiatives and related conflicts, rather than hypothetical scenarios generated through stakeholder participation. Conflicting objectives such as conservation goal/objective and other local and sectoral objectives will be considered through the governance research analyses.

Thus step 1a begins by identifying and mapping existing management plans which have a spatial boundary, spatial management initiatives, the patterns of activities and the institutional landscape. This information is then used to finalise the spatial boundaries using a flow diagram which prioritises boundaries to ensure the best information available is used to aid decisions. For the MESMA case studies where the boundaries are already defined, in many cases this step can be used to evaluate the chosen boundaries and to suggest future changes. The output from step 1a is a finalised temporal scale and spatial boundary which alongside the output from step 1b will feed into step 2 to ensure that all information that is collated is at the relevant temporal and spatial scales.

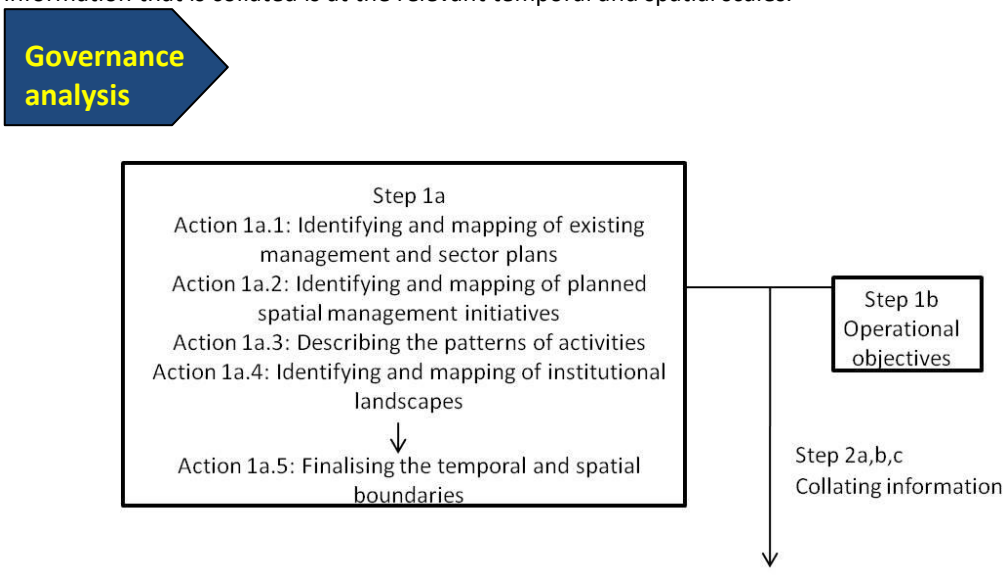


Figure 1a.1: Work flow for step 1a

Action 1a.1: Identifying and mapping of existing management plans

Is there an existing management plan in place?

Yes - Only if there is one existing management plan, covering the entire case study region and it is the management plan you want to evaluate and is either in place or in preparation.

Check the management plan for its temporal and spatial scale.
Fill out the table below:

Table 1a.1.1

Name of the plan	When was the management plan implemented/when is the management plan due to be implemented?	How often do audits or reviews take place?	What is the spatial boundary?

The spatial scale of the study should be mapped using GIS software. This may be a basic polygon of the area under management or may be a more complex map of the different managed areas.

Any sectors which are active in the area but which do not come under the existing management plan should be identified and listed below.

Table 1a.1.2

List of sectors active in the area but which are not included in the spatial management plan

No – Go to question below:

Are there one or more spatial management plans in place across the case study area whose spatial boundaries do not match the boundaries of your case study?

Yes- Fill out the tables below

Check the management plans for its/their proposed spatial and temporal limits.
Fill out the table below:

Table 1a.1.3

Spatial reference (local, national etc)	Name of plan	When was the management plan implemented?	How often will reviews to the management plan take place?	What is the spatial boundary? E.g. 500m offshore from coastline
Local	Integrated Coastal Zone Management (ICZM)	August 1997	Depending on the terms of agreement	Ghajn Tuffieha Bay (Malta)
	Integrated Coastal Zone Management (ICZM)	May 2001	Depending on the terms of agreement	Ramla Bay (Gozo).
	Grand Harbour Local	August 2006	Ten years	Grand Harbour

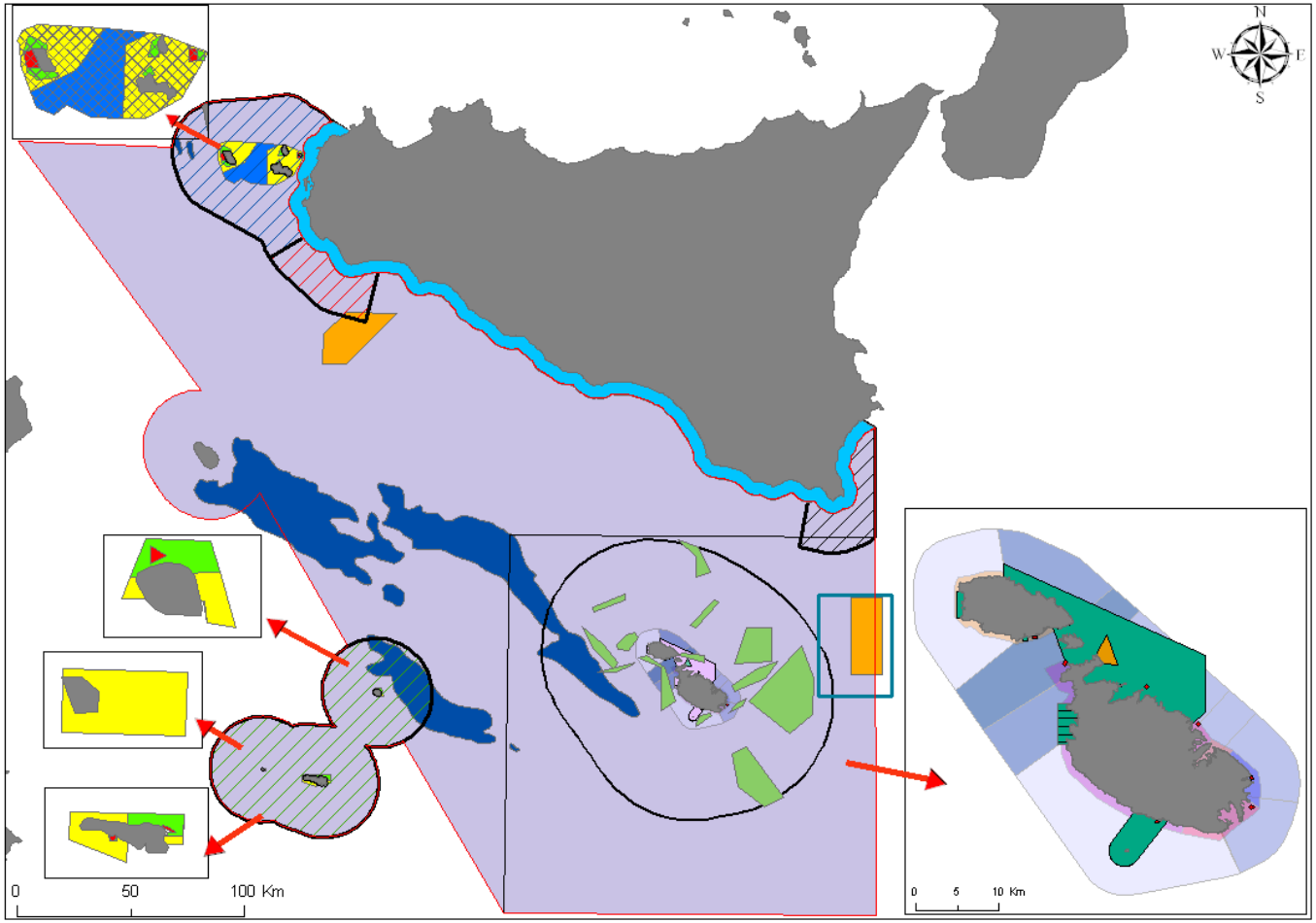
	Plan			area (malta)
	Central Malta Local Plan	August 2006	Ten years	Along the coast road of Malta
	Gozo and Comino Local Plan	August 2006	Ten years	The marine area around Gozo and Comino
	North Harbour Local Plan	August 2006	Ten years	North part of Malta
	North West Local Plan	August 2006	Ten years	North west part of Malta
	South Malta Local Plan	August 2006	Ten years	South part of Malta
	Marsaxlokk Bay Local Plan	Approved 1995	Ten years	South part of Malta
	Blue Flag Beach	2003	NA	Beach of Bugibba in St.Paul's Bay (Malta)
	Blue Flag Beach	2003	NA	Beach of Paceville in St. Julians (Malta)
	Yelkouan Shearwater	Notice to Mariners no 6 of 2008	NA	NE of Malta
National	Water Catchment Management Plan	22nd March 2011	Every six years with the first review to be held in 2013	Whole territory of the Maltese Islands up to 1NM
	Conservation area around wrecks	Notice to Mariners no 5 of 2008	NA	Maltese territorial waters
	Trawling areas as in EC 1967/2006	2006	?	Within 25Nm from Malta
	Waste Management Plan under Legal notice 278 of 2004	2004	Have to be prepared within 3 months of operation	Maltese territorial waters
	Malta's Fisheries Management Plan	2007	Every year	Maltese territorial waters
	National Operative Program for the fishery sector in Italy	12/2007	Whenever suggested by the reports carried out every 4 or 5 years	Italian territorial waters (generally but not always 12 nm from the coastline)
	National Strategic Program	07/2007	NA	Italian territorial waters (generally but not always 12 nm from the

				coastline)
	Management Plan GSA 10 Middle-South Tyrrenian Sea. Trawl	06/2010	Whenever suggested by the reports carried out every 6 months.	Italian territorial waters (generally but not always 12 nm from the coastline)
	Management Plan GSA 16 (Sicily Strait). Trawl > 18m	06/2010	Whenever suggested by annual reports (as defined in the National Operational Plan)	Italian territorial waters (generally but not always 12 nm from the coastline)
	Management Plan. Sicily lob < 18m	06/2010	Whenever suggested by annual reports (as defined in the National Operational Plan)	Italian territorial waters (generally but not always 12 nm from the coastline)
	National Management Plan for boat seines	14/01/2011	Whenever suggested by annual reports	Italian territorial waters (generally but not always 12 nm from the coastline)
	Management Plan of the Sicilian fleet - purse seines for small pelagic fishes	10/2008	Annual reports	Italian territorial waters (generally but not always 12 nm from the coastline)

The spatial scale of all management plans should be mapped using GIS software. This may be a basic polygon of the area under management or may be a more complex map of the different managed areas.

Any sectors which are active in the area but which do not come under the existing management plan should be identified and listed below.

Map 1: The different boundaries defined in conservation and fisheries management plans in the CS area.



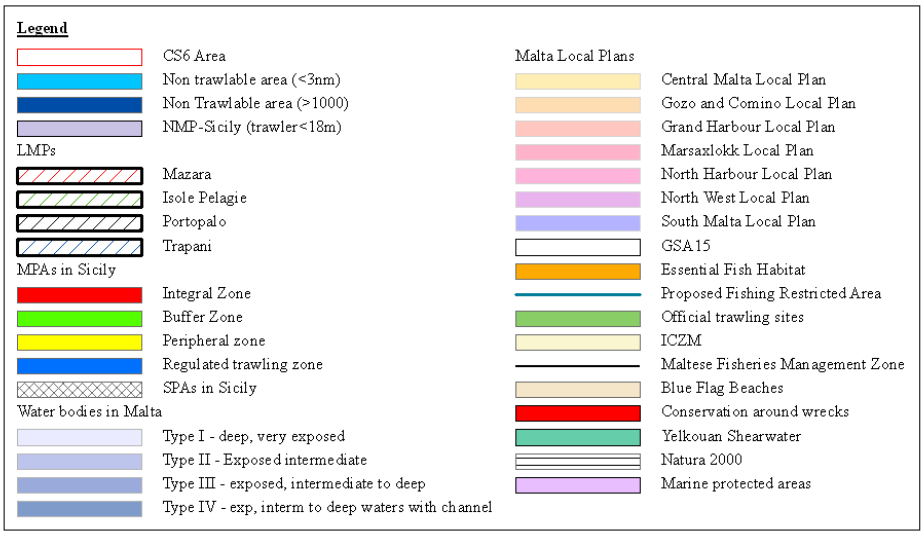


Table 1a.1.4

List of sectors active in the area but which are not included in the spatial management plan			
Sectors	**Sub-sectors**	**Activity**	**Sectors active? (Yes/No)**
Living Marine Resources	Fishing	Demersal fisheries	Yes
		Pelagic fisheries	yes
		Aquarium fish collection	Yes
		Illegal fisheries	Yes
		Traditional fisheries	Yes
		Recreational fisheries	Yes
	Aquaculture	Fish	yes
Navigation and Communications	Shipping		Yes
	Communications	Cables	Yes
	Shipbuilding		yes
Mineral, Water and Energy Resources	Oil / gas		Yes
	Water supply areas		Yes
	Beach nourishment		Yes
	Wave energy converters		Under study
Tourism and Recreation	Tourism		Yes
	Recreational activities	Sailing	Yes

		Diving	Yes
		Swimming	Yes
		Surfing	Yes
		Yacht racing	Yes
		Sea birds watching	Yes
Coastal Infrastructure Development	Harbours & Ports		Yes
	Coastal defence / Protection measures		Yes
	Bridges & other transportation infrastructures		Yes
Waste Disposal and Pollution	Dredged material disposal site		Yes
	Sewage disposal		Yes
	Waste water disposal		Yes
Ocean and Coastal Environmental Quality Protection	Marine Protected Areas		Yes
	Restoration Areas		Yes

No- Where there are no management plans in place or proposed do not fill out this action and move straight to action 1a.2.

Action 1a.2: Identifying and mapping of planned sectoral spatial initiatives

Good/ intermediate information

Using available literature, list the sectors active in the general area and indicate whether any of their activities have a spatial management initiative. Where less detailed data is available expert advice may be needed. Compile GIS layers as detailed as possible of the spatial scale of the different sectors.
Fill out the table below:

Table 1a.2.1

Spatial reference (local, national etc)	Sector	Spatial management initiative? Yes/no	Name of plan	Date of implementation	Length of initiative? E.g. 10 year plan
International	Conservation	Yes	MPA in international waters off Sicily [1]	NA	NA
International	Conservation	Yes	Mediterranean Common Dolphin Conservation Plan [2]	NA	NA
International	Conservation	Yes	Transnational MPA between Cape Feto and	NA	NA

			Cape Bon [3]		
International	Shipping	Yes	Sicilian navigation channel	In place	NA
International	Shipping	Yes	Malta navigation channel	In place	NA
International	Shipping	Yes	Marine Electronic Highway (MEH)	NA	NA
International	Energy - Gas pipelines	Yes	Greenstream area	2003	NA
International	Energy - Gas pipelines	Yes	Transmed area	1978	NA
International	Energy - Electricity cables	Yes	Malta-Sicily submarine electrical interconnection area	2012 - 2013	NA
International	Communication - Submarine cables	Yes	India-Middle East-Western Europe (I-ME-WE) submarine communication cable area	2009	NA
International	Communication - Submarine cables	Yes	Europe-India Gateway (EIG) submarine communication cable area	2010 (aprox.)	NA
International	Communication - Submarine cables	Yes	FLAG Europe Asia submarine communication cable area	1995 (aprox.)	NA
International	Communication - Submarine cables	Yes	SEA-ME-WE 3 submarine communication cable area	2000 (aprox.)	NA
International	Communication - Submarine cables	Yes	SEA-ME-WE 4 submarine communication cable area	2005 (aprox.)	NA
International	Communication - Submarine cables	Yes	LEV submarine communication cable submarine communication	1999 (aprox.)	NA

			cable area		
International	Communication - Submarine cables	Yes	Seacom submarine communication cable submarine communication cable area	2009 (aprox.)	25
National	Conservation	Yes	Marine Special Areas of Conservation	1 by 2014 and other 4 declared in 2010 but all awaiting conservations measures	NA
National	Shipping	yes	National Marine Pollution Contingency Plan	Set up in 2002 (close to adoption 2011)	NA
National	All sectors	yes	Marine Strategy Framework Directive	1st draft by 2012?	NA
National	Aquaculture	yes	Aquaculture Strategy for Malta	Prepared by June 2011	NA
Local	Energy – Wind mill farms	Yes	Talbot Bank West Concession area	NA	NA
Local	Energy – Wind mill farms	Yes	Talbot Bank Est Concession area	NA	NA
Local	Energy – Wind mill farms	Yes	Avventura Bank 1 Concession area	NA	NA
Local	Energy – Wind mill farms	Yes	Avventura Bank 2 Concession area	NA	NA
Local	Energy – Wind mill farms	Yes	Avventura Bank – Pantelleria side - West Concession area of restricted access and uses	NA	NA
Local	Energy – Wind mill farms	Yes	Avventura Bank – Pantelleria side - Est Concession area	NA	NA
Local	Energy – Wind mill farms	Yes	Pantelleria Bank	NA	NA

			Concession area		
Local	Energy – Wind mill farms	Yes	Concession area of the electrical network linking off-shore wind-mill farms and the shoreline	NA	NA
Local	Fisheries & Conservation	Yes	Piano di Gestione Locale dell'Unità Gestionale di Lampedusa [Local Management Plano of the Lampedusa Management Unit]	2012-2013 (estimated)	NA
Local	Fisheries & Conservation	Yes	Piano di Gestione Locale dell'Unità Gestionale di Pantelleria [Local Management Plano of the Pantelleria Management Unit]	2012-2013 (estimated)	NA
Local	Conservation	Yes	Zona di Protezione Speciale Pantelleria [Pantelleria Special Protection Zone]	NA	NA
Local	Conservation	Yes	Pantelleria MPA	NA	NA
Local	Aquaculture	Yes	Concession areas		
Local	Tourism	No		NA	NA
Local	Energy - Oil exploitation	Yes	Concession areas		

[1] Agreed by ACCOBAMS parties in October 2007.

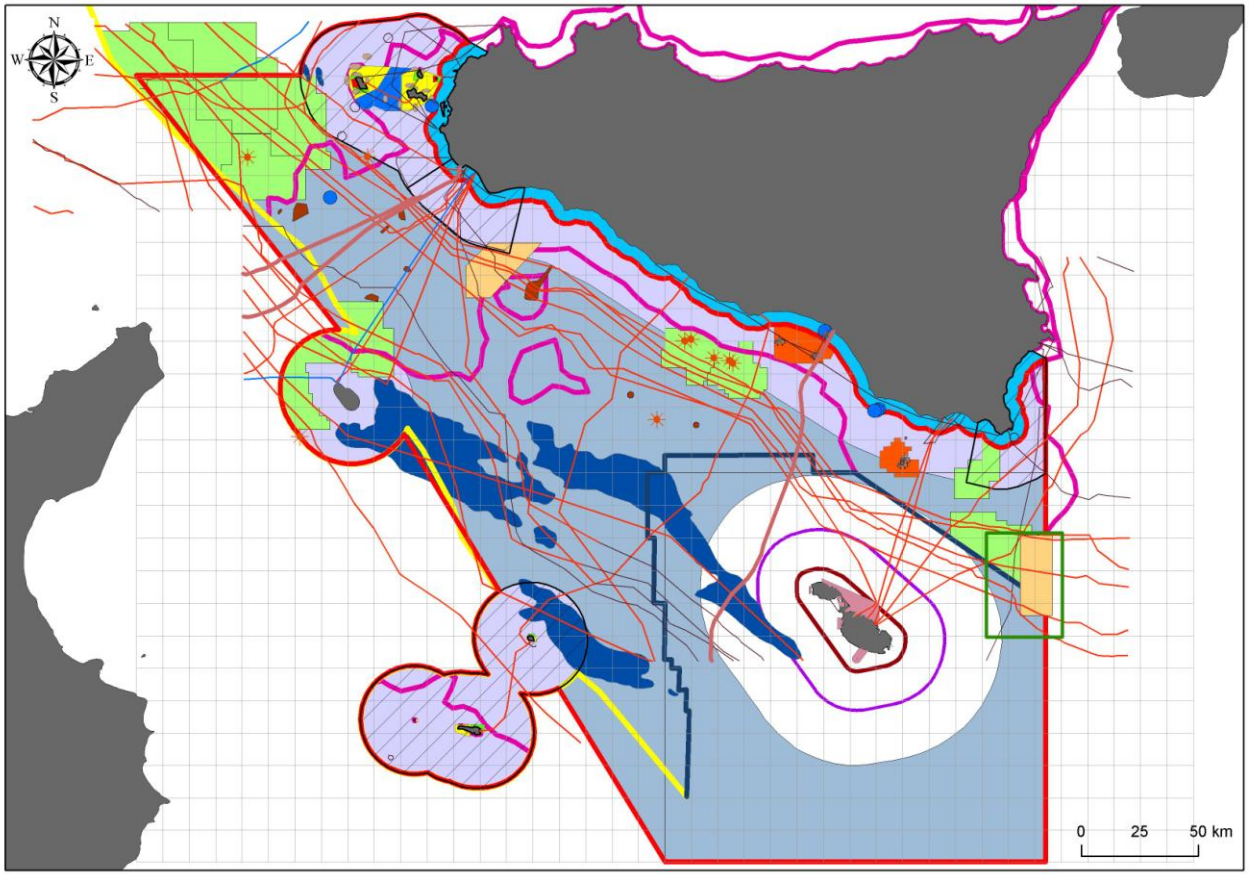
[2] Proposed by ACCOBAMS between and around Southeastern Sicily and Malta.

[3, 4] Proposed by Greenpeace as a part of the Mediterranean network of MPAs.

Poor/no information

If there is little or no information on sectors which have spatial management plans, leave this section out and move on to action 1a.3.

The spatial scale of the study should be mapped using GIS software. This may be a basic polygon of the area under management or may be a more complex map of the different managed areas.



Map 2: Partial representation of the spatial initiatives present in the CS area.

Action 1a.3: Describing the patterns of activities (existing, in progress and future planned)

Good information/ intermediate information

Using available data, or where less detailed information is available expert advice, fill out the table below regarding any activities that occur or will occur in the area and compile as detailed as possible GIS layers for where these activities occur.

Sectors	Sub-sectors	Activity	Sectors active? (Yes/No)	Whole region/certain location (specify)	Seasonal (specify) / year round	Is it an important activity in the area?	GIS layer available
Living Marine Resources	Fishing	Demersal fisheries (trawling)	Yes	Certain location	Year round	Yes	Good data
		Demersal fisheries (bottom long liners)	Yes	Whole region	Year round	Yes	Intermediate data
		Pelagic fisheries Dolphin fish	Yes	Certain location (rimja)	Seasonal	Yes	Intermediate data
		Pelagic fisheries (Others)	Yes	Certain location	Seasonal	Yes	Intermediate data
		Recreational fisheries	Yes	Whole region	Year around	Yes	Poor data
	Aquaculture		yes	Certain Location	Year round	Yes	Good data
Navigation and Communications	Shipping		Yes	Whole region	Year around	Yes	Poor data
	Marinas		yes	Certain location	Year around	Yes	Good data
	Bunkering Areas		yes	Certain location	Year around	Yes	Good data

	Communications	Cables	Yes	Certain location	Year around	Yes	Intermediate data
	Shipbuilding		Yes	Certain location	Year around	Yes	Poor data
Mineral, Water and Energy Resources	Oil and gas extraction		Yes	Certain location	Year around	Yes	Poor data
	Gas transport		Yes	Certain location	Year around	Yes	Good data
	Wave energy converters		Under study				
	Water supply areas		Yes	Certain location	Year around	Yes	Good data
Tourism and Recreation	Tourism and Recreational activities	Sailing	Yes	Whole region	Year around	Yes	Poor data
		Diving	Yes	Certain location (depth limitations)	Year around	Yes	Good data
		Swimming	Yes	Certain location (depends on distance to coast)	Year around	Yes	Good data
		Yacht racing	Yes	Whole region	Year around	Yes	Poor data
		Sea birds watching	Yes	Whole region	Year around	Yes	Poor data
Coastal Infrastructure Development	Harbours & Ports		Yes	Certain location	Year around	Yes	Good data
	Coastal defence / Protection measures		Yes	Certain location	Year around	Yes	Poor data
	Bridges & other transportation infrastructures		Yes	Certain location	Year around	Yes	Poor data
Waste Disposal	Dredged material		Yes	Certain location	Year around	Yes	Poor data

and Pollution	disposal site						
	Sewage disposal		Yes	Certain location	Year around	Yes	Intermediate data
	Waste water disposal		Yes	Certain location	Year around	Yes	Poor data
Ocean and Coastal Environmental Quality Protection	Marine Protected Areas		Yes	Certain location	Year around	Yes	Good data
	Restoration Areas	Archaeological remains	Yes	Certain locations	Year around	yes	Intermediate data
	Important Bird areas		yes	Certain location	Year around	yes	Good data

Poor/no information

Where there is little or no data available on existing activities then leave this section blank and move to action 1a.4.

Action 1a.4: Identifying and mapping of institutional landscapes

The identification and mapping of institutional landscapes will compile information on Regulatory bodies, Countries, Legislation and policies and Research institutes. This will be explored through WP6 governance research.

Using the information collated through WP6 compile GIS layers showing the relevant boundaries for each of the institutional landscapes identified.

List of the institutions identified in the institutional landscape.

1.REGULATORY BODIES

1.1.INTERNATIONAL

1.1.1 International Maritime Organization (IMO)
1.1.2 United Nations Development Assistance Framework (UNDAF)
1.1.3 The World Conservation Union – IUCN
1.1.4 World Wide Fund for Nature (WWF)
1.1.5 International Council for the Exploration of the Sea (ICES)
1.1.6 International Commission for the Conservation of Atlantic Tunas (ICCAT)
1.1.7 Convention on the Conservation of Migratory Species of Wild Animals (CMS)
1.1.8 Food and Agriculture Organization (FAO)
1.1.8.1General Fisheries Commission for the Mediterranean (GFCM)

1.2 REGIONAL (MEDITERRANEAN)

1.2.1 Marine Action Plan for the Mediterranean (MAP) Phase II Coordinating Unit (MEDU)
1.2.1.1 Mediterranean Sustainable Development Commission (MSDC)
1.2.1.2 Regional Activity Centres (RACs)
1.2.1.2.1 Regional Activity Centre for the Blue Plan/Plan Bleu - RAC/BP
1.2.1.2.2 Regional Activity Centre for the Priority Actions Programme - RAC/PAP
1.2.1.2.3 Mediterranean Regional Centre for Emergency Action against Accidental Pollution – REMPEC
1.2.1.2.4 Regional Activity Centre for Information and Communication - RAC/INFO

1.2.1.2.5 Regional Activity Centre for Cleaner Production - RAC/CP
1.2.1.2.6 Regional Activity Centre for Specially Protected Areas - RAC/SPA

1.3 EUROPEAN

1.3.1 European Council
1.3.2 European Science Foundation (ESF)
1.3.2.1 Marine Board
1.3.3 European Fisheries and Aquaculture Research Organization (EFARO)

1.4 NATIONAL

1.4.1.ITALY

1.4.1.1 Ministry of Agricultural and Fishery Policies (MIPAF)
1.4.1.2 Ministry of the Environment, Territory and Sea (Miistero dell'Ambiente e della tutela del Territorio e del Mare)
1.4.1.3 Comitato per le aree naturali protette

1.4.2 MALTA

1.4.2.1 Ministry for Resources and Rural Affiars (MRRA)
1.4.2.2 Malta Environment and Planning Authority (MEPA)
1.4.2.3 Office of the Prime Minister (OPM)
1.4.2.4 Ministry for Infrastructure,. Transport and Communications (MITC)
1.4.2.5 Ministry of Finance, the Economy and Investment
1.4.2.6 Ministry for Justice and Home Affairs (MJHA)

1.5 LOCAL

1.5.1 Siclily

1.5.1.a Assessorato Territorio e Ambiente (ARTA)
1.5.1.b Assessorato Regionale delle Risorse Agricole e Alimentari
1.5.1.b.1 Dipartimento degli interventi per la Pesca
1.5.1.c Consiglio Regionale della Pesca (CRP)

1.5.2 Sicilian provinces

1.5.2.a Trapani
1.5.2.a.1 Assessorato all'Ambiente Provincia di Trapani
1.5.2.b Agrigento
1.5.2.b.1 Assessorato all'Ambiente Provincia di Agrigento

1.5.3 Sicilian municipalities

1.5.3.a Comune di Favignana
1.5.3.b Comune di Lampedusa e Linosa

RESEARCH INSTITUTES

- IAMC-CNR
- University of Palermo
- University of Catania
- University of Messina
- ISPRA
- INGV
- MRRA-FCD

Action 1a.5: Finalising the temporal and spatial boundary for your SMA

Use the flow chart below to define the spatial boundary

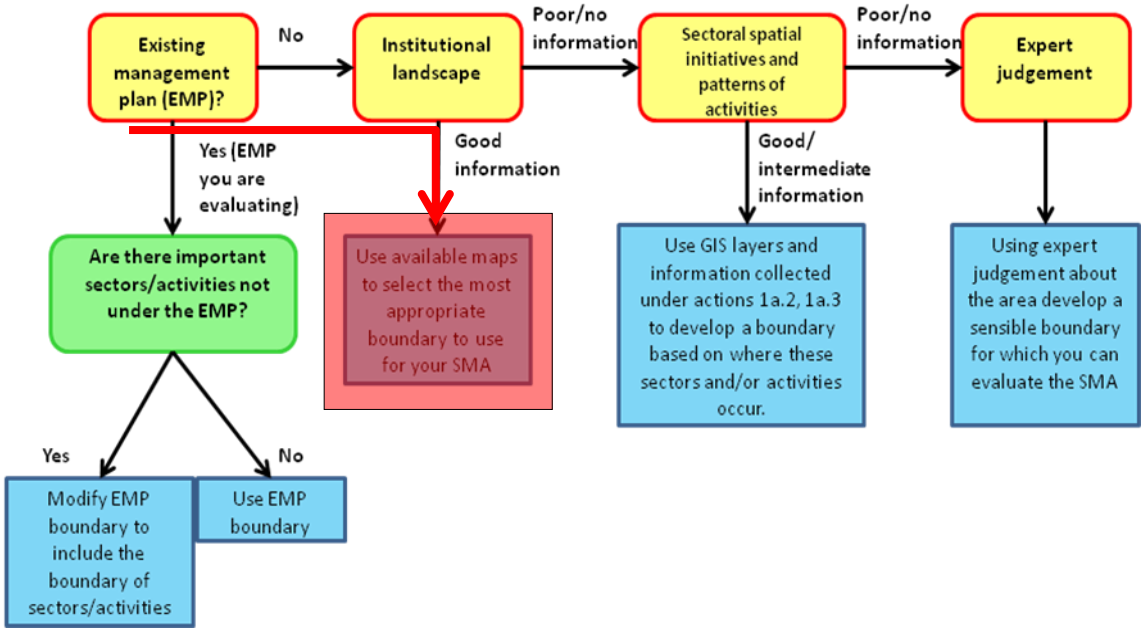


Figure 1a.2: Flow chart to define the spatial boundary. EMP (existing management plan).

The temporal boundary can be defined using the following rules:

- Where a time scale has been defined in the management plan this should be used
- If this is not officially defined then the time between reviews/ audits should be used
- If none of this information is available then a default time scale should be thought about and decided upon. Default time scale of 10 years (by 2020 according to MSFD)

Step 1b: Goals and operational objectives for SMA

This step aims to set the context of the SMA by defining the goals and operational objectives. **It is carried out alongside step 1a** together they provide details of the physical area as well as the overarching aims to be evaluated. Step 1b uses similar literature and approach to step 1a. The first actions are the identification of the existing or proposed management plan and collection of objectives which may come from legal obligations. Next looking at objectives and how they contribute to the ecosystem as well as ensuring that the ecological and socio-economic objectives are well balanced is important. In order to assess operational objectives they need to be SMART (Specific, Measurable, Achievable, Realistic and Time-bound). The validity of the goals and objectives and whether they are SMART will be evaluated from a scientific perspective through the MESMA framework, focusing on how well they address the need to contribute to a healthy and functioning ecosystem, for example, achieving good environmental status for the Marine Strategy Framework Directive. This evaluation will be complemented by the WP6 governance research, which will focus on the stakeholders' perspectives on the validity of the goals and objectives, potential/actual conflicts between different goals and objectives, and the potential for achieving a balance between high-level, top-down obligations and local priorities. Finally, the output is a list of clearly defined goals and operational objectives for the SMA and a paragraph describing any potential compliance issues to laws in the SMA. The list of goals and operational objectives is then used in step 3, to choose indicators, step 5 to assess if these objectives have been achieved or are likely to be achieved, step 6 to identify reasons why operational objectives were met or not, and finally in step 7 to identify adaptive management needs. The final important output from step 1b is a list of stakeholders in the SMA, identified through the WP6 governance research.

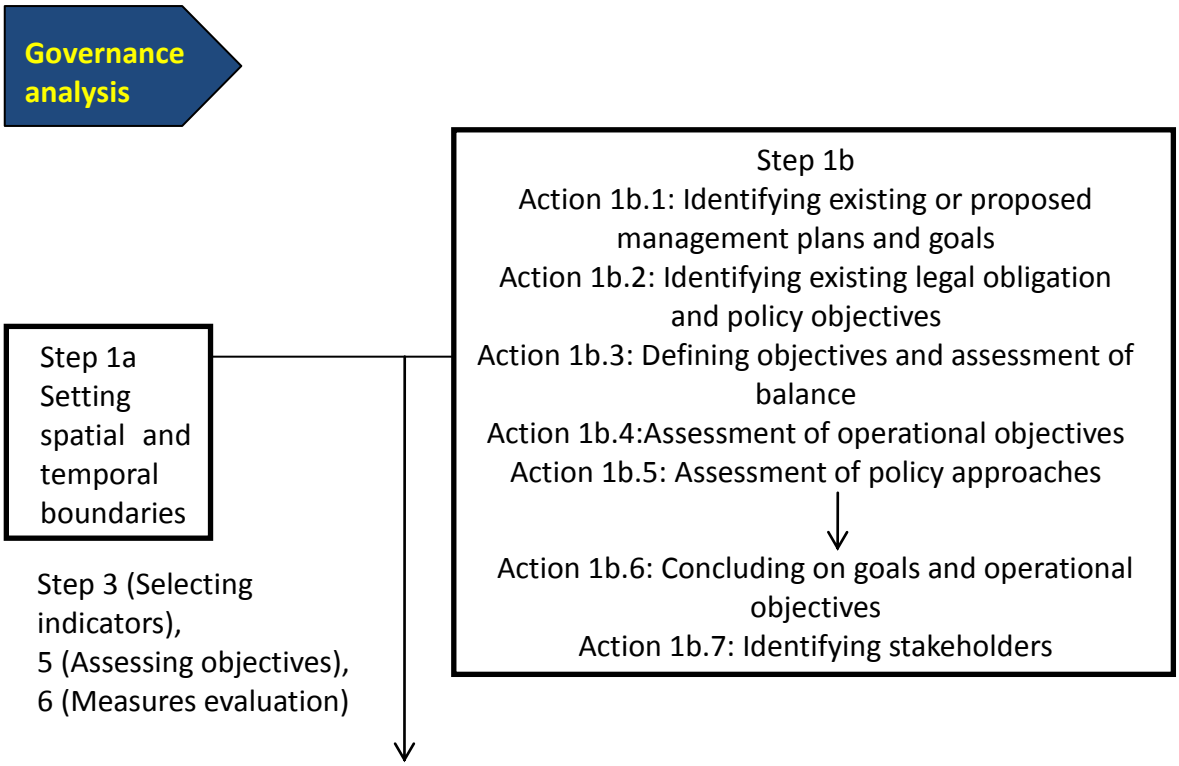


Figure 1b.1: Work flow for step 1b

Action 1b.1: Identifying existing or proposed management plan and its goals

Is there an existing management plan in place?

Yes - Only if there is one existing management plan which is the management plan you want to evaluate and is either in place or in preparation.

If there is an existing management plan in place or being proposed this plan should be checked for the goals and operational objectives. To give an overview of the goals fill out the table below:

Table 1b.1.1

Name of plan	Which (general) goals are addressed in the management/sectoral plan?	Define the area for which the goal is set (entire case study area, or just a specific part or specific habitat/species)	By which year should the goals be achieved?	How often are the management/sectoral plan and its goals reviewed?
Malta's Fisheries Management Plan 2011-2015	(1) Sustain Malta's Marine Fisheries Resources and the habitats and ecosystems upon which they depend. (2) Maintain a viable fishing industry as part of Malta's economic strategy (3) Improve public understanding of and involvement in fisheries management	Maltese territorial waters	2020(MSFD)	Annually
[1] National Operative Program for the fishery sector in Italy	(1) Enhancement of the conservation status of the environment and its resources through the reduction of the fishing effort; (2)	Italian waters in the entire case study area, which excludes the Maltese EEZ and international	2015	NA: Whenever suggested by indicators computed every 5 years (4 years after the initial implementation)

	reduction of the related socio-economic impact; (3) increase of the economic competitiveness	waters		
[2] National Strategic Program	(1) Reduction of fishing effort in terms of activity and capacity to allow for rebuilding of fish stocks; (2) recovery of competitiveness of fisheries, aquaculture and transformation of fish products, as well as enhancement of the sector organizzative effciency; (3) overcome of the sector social and economical exclusion, re-organization of the sector, modernization of structures and services; (4) sustainable development of fishery-based areas; (5) defence of long-termed job positions, maintenance of the workers' welfare also through supplementary work; (6) ecosystem restoration through protection of the fauna and flora, development of research activities and professional training; (7) reinforcement of controls on production structures, fishing and comercialization activities; and (8) strengthening and enhancement of national and regional management	Italian waters in the entire case study area, which excludes the Maltese EEZ and international waters	2013	NA

[3] Management Plan GSA 10 Middle-South Tyrrenian Sea. Trawl	(1 biological) preservation of the stocks capacity of recovering from fishing; (2 economic) enhancement of the workers' welfare; (3 social) increase of job opportunities in fishery-depending areas	Northern tip of the study area under the GSA 10 (excluding Malta)	2013	NA: Whenever suggested by indicators computed every 6 months
[4] Management Plan GSA 16 (Sicily Strait). Trawl > 18m	(1 biological) preservation of the stocks capacity of recovering from fishing; (2 economic) enhancement of the workers' welfare; (3 social) increase of job opportunities in fishery-depending areas	Italian waters in GSA 16, which represents a large portion of the study area but excludes the Maltese EEZ and international waters	2013	NA: Whenever suggested by indicators computed on a heterogeneous basis (from 1 month to 3 years)
[5] Management Plan. Sicily lob < 18m	(1 biological) preservation of the stocks capacity of recovering from fishing; (2 economic) enhancement of the workers' welfare; (3 social) increase of job opportunities in fishery-depending areas	Italian waters in the GSA 10 and 16 (a large part of the case study area excluding the Maltese EEZ and international waters)	2013	NA: Whenever suggested by indicators computed on a heterogeneous basis (from 1 month to 3 years)
[6] National Management Plan for boat seines	(1 bilogical) exploitation of biological resources within sustainable limits; (2 economic) fisheries economic sustainability; and (3 social) maintenance of job positions and adequate entry levels	All Italian waters in the study area, which excludes the Maltese EEZ and international waters	NA	NA: Whenever suggested by indicators computed yearly
[7] Management Plan of the Sicilian fleet - purse seines for small pelagic fishes	(1 biological) preservation of the stocks capacity of recovering from fishing; (2 economic) enhancement of the workers' welfare; (3 social) increase of job opportunities in fishery-depending	All Italian waters in the study area, which excludes the Maltese EEZ and international waters	2012	NA: Whenever suggested by indicators computed at undefined times

	areas			
[8] Local Management Plan of the Management Unit from Castellammare del Golfo to Marsala, including the Egadi Islands	(1 biological) preservation of the stocks capacity of recovering from fishing; (2 economic) enhancement of the workers' welfare; (3 social) increase of job opportunities in fishery-depending areas	Waters in the NW tip of the study area (basically the Egadi Islands) up to 12 nm from the shoreline (excluding Maltese territorial waters)	NA	NA: the intended peridiodicity remains undefined
[9] Local Management Plan of the Management Unit from Cape Passero to Siracusa	(1 biological) preservation of the stocks capacity of recovering from fishing and reduction of the fishing effort; (2 economic) enhancement of the workers' welfare; (3 social) increase of job opportunities in fishery-depending areas	The NE tip of the study area, up to 12 nm from the shoreline (excluding Maltese territorial waters)	NA (estimated 2013	NA: estimated to be annual from the monitoring program
[10] Local Management Plan of the Egadi Islands within Natura 2000 network	In preparation	In preparation	In preparation	In preparation
[11] Local Management Plan of the Lampedusa Management Unit	In preparation	In preparation	In preparation	In preparation
[12] Local Management Plan of the Pantelleria Management Unit	In preparation	In preparation	In preparation	In preparation

[13] Pantelleria Special Protection Zone	In preparation	In preparation	In preparation	In preparation
[14] Pantelleria MPA	In preparation	In preparation	In preparation	In preparation
[15] MPA in international waters off Sicily	Conservation of cetaceans	A large part of the study area: The strech of sea off the southern coast of Sicily (excluding Maltese territorial waters)	NA: Agreed by ACCOBAMS parties in october 2007, not established yet	NA
[16] Mediterranean Common Dolphin Conservation Plan	To ensure that Mediterranean common dolphins enjoy a favourable conservation status (i.e. stopped decline and facilitated recovery)	A large part of the study area: The strech of sea between southeastern Sicily and the waters around Malta	NA: Proposed to be immediate, not established yet	After 1 year of the proposal, inherently (expected results) after 5 years of implementation
[17] Transnational MPA between Cape Feto and Cape Bon	Protection of endangered, unique and rare habitats, as well as endangered, endemic and rare species; nursery and spawning grounds for species of economic interest; and diversity hotspots	A part of the study area: The strech of sea between Cape Feto (Italy), Cape Bon (Tunisia) and the Pelagie Islands (Italy)(excluding Maltese territorial waters)	NA: Proposed as high priority area at the CBD, not established yet	NA
[18] MPA around Malta	Protection of endangered, unique and rare habitats, as well as endangered, endemic and rare species	The waters arond Malta, roughly coincident with Maltese EEZ	NA: Proposed as a part of the Mediterranean network of MPAs, not established yet	NA

No – Go to question below:

Are there one or more spatial management plans in place across the case study area which you are not directly evaluating?

Yes- Fill out the tables below

Check these plans for their goals and objectives and fill out the table below:

Table 1b.1.2 summary of existing and proposed sectoral management plans regarding fisheries and conservation, which are being evaluated

Name of the plan	Is the management proposal complete?	When is it due to be implemented?	Which goals are addressed?	Define the area for which the goal is set (i.e. entire case study area?)	By which year should the goals be achieved?	How often will reviews take place?
Implementation of the Marine Strategy Framework Directive (MSFD) in Malta	no	1st draft by 2012 and implementation by 2014	Achieve good environmental status	Maltese Territorial waters	2020	Every 6 years after their initial establishment
Maltese Water Catchment Management Plan	Yes	March 2011	(1) Achieving good status for all water bodies, (2) prevention of the deterioration in the quality of aquatic ecosystem, their protection and the improvement of the ecological condition of all waters, (3) reduction and progressive removal of hazardous pollutants	Up to 1Nm from Malta	2015	Every six years with the first review to be held in 2013
Aquaculture Strategy for Malta	No	2011		Maltese Territorial waters		
Maltese National Marine Pollution Contingency Plan	No	2011	Prevent pollution from ships	Maltese Territorial waters	NA	NA
Maltese Integrated Coastal Zone Management (ICZM)	Yes	Ghajn Tuffieha – August 1997 Ramla Bay (Gozo) – May	(1) Protect coastal and marine habitats and biodiversity, (2) protect cultural heritage, (3) protect coastal uses that necessitate a coastal location, (4) promote and protect public access and use, (5) minimise existing and	Ghajn Tuffieha Bay, Ramla Bay (Malta)	NA	Depending on the terms of agreement

		2001	potential user conflict			
Grand Harbour Local Plan (Malta)	yes	August 2006	(1) to encourage further social and economic development of the Maltese Islands and to ensure as far as possible that sufficient land and support are available to accommodate it, (2) to use land and building efficiently and consequently to channel urban development into existing and planned development area, particularly through the rehabilitation and upgrading of existing fabric infrastructure thus constraining further inroads into undeveloped land and generally resulting in higher density development than at present, (3) to radically improve the quality of all aspects of the environment of both urban and rural areas	Grand Harbour area (Malta)	20years?	Ten years
Central Malta Local Plan	yes	August 2006		Along the coast road (Malta)		Ten years
Gozo and Comino Local Plan	yes	August 2006		The marine area around Gozo and Comino		Ten years
North Harbour Local Plan (Malta)	yes	August 2006		North part of Malta		Ten years
North West Local Plan (Malta)	yes	August 2006		North west part of Malta		Ten years
South Malta Local Plan	yes	August 2006		South part of Malta		Ten years
Marsaxlokk Bay Local Plan (Malta)	yes	Approved 1995		South part of Malta		Ten years
Blue Flag Beach (Malta)	yes	2006	(1) beach management, (2) health and safety on the beach, (3) bathing water quality standards, (4) environmental educational activities	Beach of Bugibba in St.Paul's Bay and beach of Paceville in St. Julians (Malta)	NA	NA
Yelkouan Shearwater (Malta)	yes	2008	Protection of birds and improve the protected site for wildlife and visitors	NE of Malta	2010	NA
Conservation area around	yes	2008	Protection of the environment	Maltese territorial	NA	NA

wrecks (Malta)				waters		
Trawling areas as in the Maltese EC 1967/2006	yes	2006	To limit severe environmental impact and to promote sustainable fisheries	Within 25Nm from Malta	NA	NA
Maltese Waste Management Plan	yes	2004	(1) achieving and maintaining an effective balance between economic development and protection of the environment, (2) encouraging open and flexible markets for waste management services, (3) intervening in these markets only where necessary, (4) using economic instrument in preference to legal instruments where possible	Maltese territorial waters	NA	Have to be prepared within 3 months of operation
Malta's Fisheries Management Plan	yes	2007	Describes the current situation in the fisheries sector and establishes the overall aims and objectives for the development of the Maltese fisheries sector	Maltese territorial waters	NA	Annually
[19] Concessions for aquaculture facilities	NA	NA	NA	NA	NA	NA
[20] Sicilian navigation channel	Yes	Already implemented	To provide secure routes for traffic of large oil tankers and bulk carriers through the Strait of Sicily	Two corridors along the Sicilian part of the study area	Already implemented	NA
[21] Malta navigation channel	Yes	Already implemented	To provide secure routes for traffic of large oil tankers and bulk carriers through the Strait of Sicily	Two corridors along the Maltese part of the study area	Already implemented	NA
[22] Marine Electronic Highway	NA	NA	To improve security in the routes for traffic of large oil tankers and bulk	An undefined band along	NA	NA

(MEH), not in place			carriers through the Strait of Sicily	the study area		
[23] Oil and gas exploitation concession C.C 3.AG	Yes	From 13/06/1980 to 13/06/2020	Exploitation of an estimated (currently NA) volume of oil and gas	A piece of 394,8 Km^2 off the southern coast of Sicily	2020	NA: Changes made every 10 years aprox.
[24] Oil exploitation concession C.C 6.EO	Yes	From 17/02/1984 to 28/12/2012	Exploitation of an estimated (currently NA) volume of oil and gas	A piece of 184,8 Km^2 off the southern coast of Sicily	28/12/2012	NA
[25] Oil exploration concession C.R146.NP	Yes	From 28/09/2004 to 24/05/2010 (time course suspended since then)	Seismic exploration of oil and gas fields under the sea bottom	A piece of 620,31 Km^2 off the southern coast of Sicily	28/09/2010 but the deadline is currently suspended	NA
[26] Oil exploration concession C.R147.NP	Yes	From 30/09/2004 to 24/05/2010 (time course suspended since then)	Seismic exploration of oil and gas fields under the sea bottom	A piece of 637,18 Km^2 off the southern coast of Sicily	30/09/2010 but the deadline is currently suspended	NA
[27] Oil exploration concession C.R148.VG	Yes	From 27/11/2006 to 25/02/2011 (time course suspended since then)	Seismic exploration of oil and gas fields under the sea bottom	A piece of 336,98 Km^2 off the southern coast of Sicily	27/11/2013 but the deadline is currently suspended	NA
[28] Oil exploration concession G.R 13.AG	Yes	From 09/11/1999 to 25/02/2011 (time	Seismic exploration of oil and gas fields under the sea bottom	A piece of 423,09 Km^2 off the southern coast of Sicily	21/05/2014	NA: Changes made on irregular basis from 1 to 3 years

		course suspended since then)				
[29] Oil exploration concession G.R 14.AG	Yes	From 08/11/1999 to 25/02/2011 (time course suspended since then)	Seismic exploration of oil and gas fields under the sea bottom	A piece of 408,78 Km^2 off the southern coast of Sicily	20/05/2014	NA
[30] Oil exploration concession G.R 20.NP	Yes	From 14/02/2007	Seismic exploration of oil and gas fields under the sea bottom	A piece of 743,81 Km^2 off the southern coast of Sicily	14/02/2013	NA
[31] Oil exploration concession G.R 22.NP	Yes	From 14/02/2007	Seismic exploration of oil and gas fields under the sea bottom	A piece of 726,90 Km^2 off the southern coast of Sicily	14/02/2013	NA
[32] Oil exploration concession C.R147.NP	Yes	From 30/09/2004 to 24/05/2010 (time course suspended since then)	Seismic exploration of oil and gas fields under the sea bottom	A piece of 637,18 Km^2 off the southern coast of Sicily	30/09/2010	NA
[33] Oil exploration concession G.R 13.AG	Yes	From 09/11/1999 to 25/02/2011 (time course suspended since then)	Seismic exploration of oil and gas fields under the sea bottom	A piece of 423,09 Km^2 off the southern coast of Sicily	21/05/2014	NA: Changes made on an irregular basis from 2 to 3 years
[34] Oil exploration concession G.R 14.AG	Yes	From 08/11/1999 to 25/02/2011 (time	Seismic exploration of oil and gas fields under the sea bottom	A piece of 408,78 Km^2 off the southern coast of Sicily	20/05/2014	NA: Changes made on an irregular basis from 2 to 4 years

		course suspended since then)				
[35] Oil exploration concession G.R 15.PU	Yes	From 12/11/2002 to 02/07/2008 (time course suspended since then)	Seismic exploration of oil and gas fields under the sea bottom	A piece of 657,19 Km^2 off the southern coast of Sicily	12/11/2008	NA
[36] Oil exploration concession G.R 17.NP	Yes	From 24/03/2005	Seismic exploration of oil and gas fields under the sea bottom	A piece of 708,62 Km^2 off the southern coast of Sicily	24/03/2011	NA
[37] Oil exploration concession G.R 18.NP	Yes	From 10/05/2005	Seismic exploration of oil and gas fields under the sea bottom	A piece of 736,88 Km^2 off the southern coast of Sicily	10/05/2011	NA
[38] Oil exploration concession G.R 19.NP	Yes	From 11/05/2005	Seismic exploration of oil and gas fields under the sea bottom	A piece of 709,61 Km^2 off the southern coast of Sicily	11/05/2011	NA
[39] Oil exploration concession G.R 20.NP	Yes	From 14/02/2007	Seismic exploration of oil and gas fields under the sea bottom	A piece of 743,81 Km^2 off the southern coast of Sicily	14/02/2013	NA
[40] Oil exploration concession G.R 21.NP	Yes	From 14/02/2007	Seismic exploration of oil and gas fields under the sea bottom	A piece of 742,70 Km^2 off the southern coast of Sicily	14/02/2013	NA
[41] Oil exploration concession G.R 22.NP	Yes	From 14/02/2007	Seismic exploration of oil and gas fields under the sea bottom	A piece of 726,90 Km^2 off the southern coast of Sicily	14/02/2013	NA

[42] Transmed gas pipeline concession area	Yes	1978 2005	To transport 12,3x10^9 m^3 gas/year, upgraded to 24 x10^9 m^3 gas/year in 1997, 27.2x10^9 m^3 gas/year in 2008 and 30.52x10^9 m^3 gas/year to be finished by 2012	A band across the study area, between Cape Feto (Sicily) and Cape Bon (Tunisia)	1983 NA	NA NA
[43] Greenstream gas pipeline concession area	Yes	From 2003 at least	To transport 12,3x10^9 m^3 gas/year	A band across the study area between Gela (Sicily) and Mellitah (Libya)	2004	NA
[44] Malta-Sicily submarine electrical interconnection area	Yes	2012	To ensure network integrity	A band between Pembroke (Malta) and the southern coast of Sicily	NA	NA
[45] India-Middle East-Western Europe (I-ME-WE) submarine communication cable area	Yes	Already implemented	To ensure cable integrity	A narrow band along the whole study area	NA	NA
[46] Europe-India Gateway (EIG) submarine communication cable area	Yes	Already implemented	To ensure cable integrity	A narrow band along the whole study area	NA	NA
[47] FLAG Europe Asia submarine communication cable area	Yes	Already implemented	To ensure cable integrity	A narrow band along the whole study area	NA	NA
[48] SEA-ME-WE 3 submarine	Yes	Already implemented	To ensure cable integrity	A narrow band along the whole	NA	

communication cable area				study area		
[49] SEA-ME-WE 4 submarine communication cable area	Yes	Already implemented	To ensure cable integrity	A narrow band along the whole study area	NA	
[50] LEV submarine communication cable area	Yes	Already implemented	To ensure cable integrity	A narrow band along the whole study area	NA	
[51] Seacom submarine communication cable area	Yes	Already implemented	To ensure cable integrity	A narrow band along the whole study area	NA	
[52] Wind-mill farm in the concession area of the Talbot Bank West	NA	NA	To ensure integrity to the wind-mill farm and safety for navigation in its neighbourhood	An area covering the whole Talbot bank down to the 20 m bathymetry	NA	
[53] Wind-mill farm in the concession area of the Talbot Bank Est	NA	NA	To ensure integrity to the wind-mill farm and safety for navigation in its neighbourhood	An area covering the whole Talbot bank down to the 20 m bathymetry	NA	
[54] Wind-mill farm in the concession area of the Avventura Bank 1	NA	NA	To ensure integrity to the wind-mill farm and safety for navigation in its neighbourhood	An area covering the whole Avventura bank down to the 20 m bathymetry	NA	
[55] Wind-mill farm in the concession area of the Avventura Bank 2	NA	NA	To ensure integrity to the wind-mill farm and safety for navigation in its neighbourhood	An area covering the whole Avventura bank down to the 20 m bathymetry	NA	
[56] Wind-mill farm in	NA	NA	To ensure integrity to the wind-mill farm and	An area covering	NA	

the concession area of the Avventura Bank – Pantelleria side - West			safety for navigation in its neighbourhood	the whole Avventura bank down to the 20 m bathymetry		
[57] Wind-mill farm in the concession area of the Avventura Bank – Pantelleria side - East	NA	NA	To ensure integrity to the wind-mill farm and safety for navigation in its neighbourhood	An area covering the whole Avventura bank down to the 20 m bathymetry	NA	
[58] Wind-mill farm in the concession area of the Pantelleria Bank	NA	NA	To ensure integrity to the wind-mill farm and safety for navigation in its neighbourhood	An area covering the whole Pantelleria bank down to the 20 m bathymetry	NA	
[59] Electrical network between off-shore wind-mill farms and the shoreline	NA	NA	To ensure integrity to the electrical network	An area within the banks to hold the network and a band between the network and the shoreline at Sciacca (Sicily)	NA	

In the case of several management plans in one case study area:

- fill the table above for each management plan.
- check for any overlapping or conflicting goals between the management plans (in order to get a complete overview of all goals stated).

CONSERVATION. Navigation channels, seismic exploration, oil platforms and off-shore wind-mill farms are in conflict with conservation initiatives. In particular, navigation channels impact cetaceans populations through disturbances caused by noise and pollution, as well as collisions. Navigation channels, although located at high depths, also claim for space that it is potentially used as fishing grounds. This is particularly the case near capes.

Off-shore wind-mill farms are proposed to be placed onto off-shore banks that are biodiversity hotspots. They represent places with high level of naturality (near pristine state) and hold many endangered, rare and characteristic species and habitats.

Proposals for oil exploitation concessions in Sicily have been submitted to Italian authorities, summing up more than 8000 Km^2 in the study area. Submarine air guns used during bottom surveys are thought to heavily impact toothed wales, large squids and demersal fishes. Fracking technology for gas and oil exploitation from shales has unforeseen environmental impacts on the environment. Areas of restricted uses claim for space in a heavily fished area. Chronic leaking of oil from facilities is a major source of pollution to the environment and trophic web. Off-shore facilities also serve as stepping stones for coastal invasive species.

No- Where there are no management plans in place or proposed do not fill out this action and move straight to action 1b.2.

Action 1b.2: Identifying existing legal obligations and policy objectives

Legal obligations are clearly defined and recorded information, using available sources list the laws, statutes and regulations applicable to the area including domestic legislation transposing international and European obligations and local byelaws. Expert legal opinion should be obtained to ensure that all obligations have been identified and recorded in table 1b.2.
Identify related policy objectives and guidance and fill out table 1b.2 below.

Table 1b.2

Spatial reference (local, national etc)	Statute - title and reference	Implementing department or agency	Key regulations and byelaws - reference	Related policy objectives and guidance - reference	GIS layers availability? Yes/no
[69] Global 2004	[69] International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention), adopted 2004, not in force	It will enter into force 12 months after ratification by 30 States, representing 35% of world merchant shipping tonnage	Sets out provisions on facilities for the reception of sediments, on scientific and technical research and monitoring, on survey certification and inspection, and on technical assistance and cooperation. The annexes carry provisions on management and control requirements for ships, standards for ballast water management, and survey and certification requirements for ballast water management	To prevent, minimize and ultimately eliminate the transfer of harmful aquatic organisms and pathogens through the control and management of ships´ ballast water and sediments	
[83] Global 2004	[83] UN General Assembly		Compliance with UN General Assembly resolution 46/215	To avoid large-scale pelagic drift-net fishing and unauthorized fishing in zones of	

	resolution 58/14, 2004			national jurisdiction; and to limit fisheries by-catch and discards	
[82] Global 2003	[82] UN General Assembly resolution 57/142, 2003		Compliance with UN General Assembly resolution 46/215	To avoid large-scale pelagic drift-net fishing and unauthorized fishing in zones of national jurisdiction; and to limit fisheries by-catch and discards	
[81] Global 2001	[81] UN General Assembly resolution 55/8, 2001		Compliance with UN General Assembly resolution 46/215	To avoid large-scale pelagic drift-net fishing and unauthorized fishing in zones of national jurisdiction; and to limit fisheries by-catch and discards	
[72] Global 2001	[72] Voluntary instrument - FAO International Plan of Action to Prevent, Deter and Eliminate Illegal, Unreported and Unregulated Fishing, adopted 2001		Actions for States including port States and market States, to overcome illegal, unreported and unregulated fishing	(1) To achieve world-wide preferably by 2003, but not later than 2005, an efficient, equitable and transparent management of fishing capacity; (2) to exercise caution to avoid growth in capacity undermining long-term sustainability objectives	
[80] Global 1999	[80] UN General Assembly resolution 53/33, 1999		Compliance with UN General Assembly resolution 46/215	To avoid large-scale pelagic drift-net fishing and unauthorized fishing in zones of national jurisdiction; and to limit fisheries by-catch and discards	
[79] Global 1998	[79] UN General Assembly resolution 52/29, 1998		Compliance with UN General Assembly resolution 46/215	To avoid large-scale pelagic drift-net fishing and unauthorized fishing in zones of national jurisdiction; and to limit fisheries by-catch and discards	
[61] Global 1996	[61] Protocol to the Convention on the Prevention of Marine Pollution by Dumping of		Regulates dumping in the marine environment	To control pollution of the sea by dumping and to encourage regional agreements supplementary to the Convention	

	Wastes and Other Matter, 7 November 1996				
[78] Global 1996	[78] UN General Assembly resolution 51/36, 1996		Compliance with UN General Assembly resolution 46/215	To avoid large-scale pelagic drift-net fishing and unauthorized fishing in zones of national jurisdiction; and to limit fisheries by-catch and discards	
[77] Global 1995	[77] UN General Assembly resolution 50/25, 1995		Compliance with UN General Assembly resolution 46/215	To avoid large-scale pelagic drift-net fishing and unauthorized fishing in zones of national jurisdiction; and to limit fisheries by-catch and discards	
[62] Global 1995	[62] Voluntary instrument - Washington Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities, adopted 1995			Aim: To prevent the degradation of the marine environment from land-based activities	
[84] Global 1995	[84] Agreement for the Implementation of the Provisions of the UNCLOS of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, adopted 1995, in force		Conservation and management of straddling and highly migratory fish stocks in areas beyond national jurisdiction, mainly through the establishment of regional and sub-regional fisheries management organisations	Conservation and management of straddling and highly migratory fish stocks in areas beyond national jurisdiction	
[71] Global	[71] Voluntary instrument -		States should ensure compliance with, and	To establish principles, in accordance with the	

1995	FAO Code of Conduct for Responsible Fisheries, adopted 31 October 1995, enforcement NOT applicable		enforcement of, conservation and management measures (including through use of monitoring, control and surveillance, and appropriate sanctions); ensure conservation of target species but also of species belonging to the same ecosystem or associated with or dependent upon the target species; and apply a precautionary approach widely in order to preserve the aquatic environment, taking into account uncertainties regarding the impact of fisheries on non-target and associated or dependent species	relevant rules of international law, for responsible fishing and fisheries activities, taking into account all their relevant biological, technological, economic, social, environmental and commercial aspects; (2) establish principles and criteria for the elaboration and implementation of national policies for responsible conservation of fisheries resources and fisheries management and development; (3) serve as an instrument of reference to help States to establish or to improve the legal and institutional framework required for the exercise of responsible fisheries and in the formulation and implementation of appropriate measures; (4) provide guidance which may be used where appropriate in the formulation and implementation of international agreements and other legal instruments, both binding and voluntary; (5) facilitate and promote technical, financial and other cooperation in conservation of fisheries resources and fisheries management and development; (6) promote the contribution of fisheries to food security and food	

				quality, giving priority to the nutritional needs of local communities; (7) promote protection of living aquatic resources and their environments and coastal areas; (8) promote the trade of fish and fishery products in conformity with relevant international rules and avoid the use of measures that constitute hidden barriers to such trade; (9) promote research on fisheries as well as on associated ecosystems and relevant environmental factors; and (10) provide standards of conduct for all persons involved in the fisheries sector	
[85] Global 1993	[85] Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, adopted November 1993, in force since 24 April 2003		Improve compliance by fishing vessels with high seas international conservation and management measures. Set rules for dispute resolution between different bodies with competence on the high seas (e.g. ICCAT and GFCM)	High seas environmental conservation	
[66] Global 1992	[66] Treaty - United Nations Convention on Biological Diversity, adopted 1992, in force		In the case of components of biodiversity applies within the limits of national jurisdiction. In the case of processes and activities carried out under a party's	(1) Conservation of biological diversity; (2) sustainable use of its components; (3) fair and equitable sharing of the benefits arising out of the utilisation of genetic resources	

			jurisdiction or control applies within or outside the limits of national jurisdiction		
[76] Global 1991	[76] UN General Assembly resolution 46/215, 1991		Implementation of a global moratorium on all large-scale pelagic drift-net fishing on the high seas by 31 December 1992	Ask for measures to avoid large-scale pelagic drift-net fishing and unauthorized fishing in zones of national jurisdiction; and to limit fisheries by-catch and discards. Recommends international cooperation to get sound scientific knowledge on the matter	
[75] Global 1990	[75] UN General Assembly resolution 45/197, 1990		Regards large-scale pelagic drift-net fishing on the high seas	Worldwide moratorium on all driftnet fishing	
[74] Global 1989	[74] UN General Assembly resolution 44/225, 1989		Concern about the size of the fleets, the length of the nets, their mode of operation, their potential impact on anadromous and highly migratory species, their by-catch and the concern of coastal countries on the state of resources close to their exclusive economic zones	To cease large-scale high seas driftnet fishing elsewhere in the world by 30 June 1992 at the latest	
[63] Global 1989	[63] Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, adopted 1989, in force		Regulates transboundary movements of hazardous wastes, including by maritime ways. Promotes Environmentally Sound Management (ESM) means addressing the issue through an “integrated life-cycle approach”, which involves strong controls from the generation of a hazardous waste to its	To achieve Environmentally Sound Management (ESM) in order to (1) protect human health and (2) the environment by minimizing hazardous waste production whenever possible	

			storage, transport, treatment, reuse, recycling, recovery and final disposal		
[67] Global 1982	[67] United Nations Convention on the Law Of the Sea (UNCLOS), adopted on 10 Dec 1982, in force since 16 Nov 1994 (1833 UNTS 31363)	States, directly or through competent international organizations	Regimes for territorial seas, exclusive economic zones, continental shelf, high seas, areas (i.e. the seabed and subsoil beyond national jurisdiction). Regimes regarding protection and preservation of the marine environment, marine scientific research, and dispute resolution	(1) The acquisition, evaluation and dissemination of marine technological knowledge and facilitate access to such information and data; (2) the development of appropriate marine technology; (3) the development of the necessary technological infrastructure to facilitate the transfer of marine technology; (4) the development of human resources through training and education of nationals of developing States and countries and especially the nationals of the least developed among them; (5) international co-operation at all levels, particularly at the regional, sub-regional and bilateral levels	
[64] Global 1982	[64] Voluntary instrument - UNEP Conclusions of the study of the legal aspects concerning the environment related to offshore mining and drilling within the limits of national jurisdiction, adopted 1982		Regulates pollution (both substances and energy) and other adverse effects from “offshore exploration for and exploitation of hydrocarbons and other minerals, and related activities, within the limits of national jurisdiction	(1) To improve environmental management; and (2) to protect the marine environment	

[86] Global 1979	[86] Convention on the Conservation of Migratory Species of Wild Animals (CMS) adopted 23 June 1979, in force since 1 November 1983		To conserve and restore habitats of importance in removing the species from danger of extinction, to act in relation to activities or obstacles that seriously impede or prevent transboundary migration, to act in relation to factors that endanger or are likely to further endanger the species	To conserve and restore habitats of importance for endangered migratory species; to allow migratory species transboundary movements; to avoid further endangering of migratory species	
[68] Global 1973	[68] International Convention for the Prevention of Pollution From Ships (MARPOL), adopted 2 Nov 1973, adopted 1973, in force since 2 Oct 1983 as amended by the London Protocol of 1 Jun 1978 (1340 UNTS 61)		Prevents pollution of the marine environment by the discharge of harmful substances or effluents containing such substances in contravention of the treaty. Applies to ships, fixed and floating platforms	(1) Safety at sea to protect passengers and crew members; and (2) also to protect the marine environment and coastal regions	
[87] Global 1973	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), adopted 1973, in force		Trade of endangered species of fauna and flora	To avoid threatening wild fauna and flora by international trade in specimens	
[60] Global 1972	[60] Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention, LC) of 29 December		It covers the deliberate disposal at sea of wastes or other matter from vessels, aircraft, and platforms. It does not cover discharges from land-based sources such as pipes and outfalls, wastes generated incidental to normal operation of vessels,	To control pollution of the sea by dumping and to encourage regional agreements supplementary to the Convention	

	1972, in force since 30 Aug 1975 (11 ILM 1294)		or placement of materials for purposes other than mere disposal		
[73] Global 1969	[73] Treaty for the establishment of the International Convention for the Conservation of Atlantic Tunas (ICCAT), adopted 1969, in force, 1992 protocol not yet in force		The ICCAT make binding recommendations to maintain the populations of tuna and tuna-like species at levels that will permit the maximum sustainable catch	To cooperate in maintaining the populations of tuna and tuna-like fish found in the Atlantic Ocean at levels which permit the for food and other purposes	
[59c] Global 1958	Convention on the High Seas of 29 April 1958 (UNTS 450, p. 11-82), in force since 27 Jan 1980		Guarantees both for coastal and non-coastal States freedom of certain activities: navigation, fishing and deployment of submarine cables and pipelines over the high seas	(1) Freedom of navigation; (2) Freedom of fishing; (3) Freedom to lay submarine cables and pipelines	
[89] Global 1946	[89] International Convention for the Regulation of Whaling of 2 December 1946 (62 Stat. 1716, 161 UNTS 72), adopted in 1946, in force		Establishes the International Whaling Commission (IWC) and regulations on whaling. There is currently a moratorium on all commercial whaling under the treaty, with few exceptions	(1) Protection of whales from overhunting; (2) regulation of whale fisheries to ensure proper conservation; and (3) development of whale stocks, and safeguarding for future generations the great natural resources represented by whale stocks	
[70] Global 1902	[70] ICES Convention, 22 July 1902. It produces recommendations which are not legally binding to its members (UK but not Italy)		The ICES Mission includes: (1) Focusing on the North Atlantic and adjacent seas, with due consideration for global concerns; (2) Investing in both short- and long-term interdisciplinary research, including physical, chemical, biological, and social sciences; (3)	(1) Develop a challenging core science programme to fulfil the ICES Mission; (2) Provide sound, credible, timely, and understandable advice that is relevant to today's and future societal needs; (3) Provide members of the ICES scientific community, efficiently	

			Establishing partnerships with other organizations that share a common interest; (4) Being responsive to emerging issues; (5) Creating effective arrangements to provide scientific advice; and (6) Informing the public objectively and effectively about marine ecosystem issues	and effectively, with the support they need to meet the scientific goals; (4) Establish and maintain partnerships that are mutually beneficial in fulfilling the ICES Vision; and (5) Raise public understanding of marine ecosystems and their relevance to society	
[M1] Global	Regulation 19 of Solas Chapter V: AIS				no
[102] Mediterranean 2011	Protocol on Integrated Coastal Zone Management (ICZM) in force since 24 Mar 2011 in Sicily		Seventh of the seven protocols of the UNEP Mediterranean Action Plan for the Barcelona Convention (BC) legal framework. Promotes the integrated management of the coastal zones, taking into account the protection of areas of ecological and landscape interest and the rational use of natural resources	(1) To facilitate, through the rational planning of activities, the sustainable development of coastal zones by ensuring that the environment and landscapes are taken into account in harmony with economic, social and cultural development; (2) to preserve coastal zones for the benefit of current and future generations; (3) to ensure the sustainable use of natural resources, particularly with regard to water use; (4) to ensure preservation of the integrity of coastal ecosystems, landscapes and geomorphology; (5) to prevent and reduce the effects of natural hazards and in particular of climate change, which can be	

				induced by natural or human activities; (6) achieve coherence between public and private initiatives and between all decisions by the public authorities, at the national, regional and local levels, which affect the use of the coastal zone	
[92] Mediterranean 1997	[92] Agreement for the Establishment of the General Fisheries Commission for the Mediterranean, in force since 29 April 2004 as amended in 1997		The Commission adopt binding measures for the conservation and rational management of living marine resources	(1) To promote the development, conservation, rational management and best utilization of living marine resources; (2) to promote the sustainable development of aquaculture in the Mediterranean, Black Sea and connecting waters	
[91] Mediterranean 1996	[91] Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area, adopted 24 November 1996, in force since 1 June 2001 (only Malta)		General prohibition of deliberate taking of cetaceans. General duty regarding the creation and maintenance of a network of specially protected areas. Other specific duties	(1) To reduce threats to all cetaceans; (2) to promote closer cooperation among Parties; (3) to enforce legislation to prevent the deliberate taking of cetaceans in fisheries by vessels under the Parties' flag or within their jurisdiction; and (4) to minimise incidental catches	
[100] Mediterranean 1996	Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal, 1996, not yet in force		Sixth of the seven protocols of the UNEP Mediterranean Action Plan (MAP) for the Barcelona Convention (BC) legal framework. Prevents, abates and eliminates pollution by transboundary movements and disposal of hazardous wastes in the Mediterranean	To prevent, reduce, combat and, as far as possible, eliminate pollution in the Zone of the Mediterranean Sea	

[97] Mediterranean 1995	Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (an amended version of the BC) 1995		Creation of a legal and institutional framework that promotes the adoption of detailed (seven) Protocols and facilitates their implementation (e.g. by establishing provisions on monitoring, reporting, public participation, compliance control and dispute resolution)	(1) To assess and control marine pollution to ensure sustainable management of natural marine and coastal resources; (2) to integrate the environment in social and economic development; (3) to protect the marine environment and coastal zones through prevention and reduction of pollution, and as far as possible, elimination of pollution, whether land or sea-based; (4) to protect the natural and cultural heritage; (5) to strengthen solidarity among Mediterranean coastal States; (6) to contribute to improvement of the quality of life	
[90] Mediterranean 1995	Specially Protected Areas and Biological Diversity Protocol (SPA protocol), adopted 10 June 1995, in force since 12 December 1999		Establishment of specially protected areas (SPAs) and specially protected areas of Mediterranean importance (SPAMIs)	To safeguard: (1) representative types of coastal and marine ecosystems of adequate size to ensure their long-term viability and to maintain their biological diversity; (2) habitats which are in danger of disappearing in their natural area of distribution in the Mediterranean or which have a reduced natural area of distribution as a consequence of their regression or on account of their intrinsically restricted area; (3) habitats critical to the survival,	

				reproduction and recovery of endangered, threatened or endemic species of flora or fauna; and (4) sites of particular importance because of their scientific, aesthetic, cultural or educational interest	
[101] Mediterranean 1995	Protocol Concerning Mediterranean Specially Protected Areas (SPA protocol) adopted on 2 April 1982, in force since 1986; revised as the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA and Biodiversity Protocol) on 10 June 1995		Forth of the seven protocols of the UNEP Mediterranean Action Plan (MAP) for the Barcelona Convention (BC) legal framework	To safeguard (1) representative types of coastal and marine ecosystems of adequate size to ensure their long-term viability and to maintain their biological diversity; (2) habitats which are in danger of disappearing in their natural area of distribution in the Mediterranean or which have a reduced natural area of distribution as a consequence of their regression or on account of their intrinsically restricted area; (3) habitats critical to the survival, reproduction and recovery of endangered, threatened or endemic species of flora or fauna; (4) sites of particular importance because of their scientific, aesthetic, cultural or educational interest	
[99] Mediterranean 1994	Protocol for the Protection of the Mediterranean Sea against		Fifth of the seven protocols of the UNEP Mediterranean Action Plan (MAP) for the Barcelona Convention	To prevent, reduce, combat and, as far as possible, eliminate pollution in the Zone of the Mediterranean	

	Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil, adopted 1994, not in force as 2004		(BC) legal framework. Establishes duties related to activities of scientific research on the resources of the seabed and its subsoil, exploration (i.e. seismological, surveys of the seabed and its subsoil, sample taking, exploration drilling), and exploitation activities	Sea. See [99; 149; 151; 152; 168; 206; 213; 214]	
[98] Mediterranean 1980	[96] Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities, adopted 17 May 1980, in force since 17 June 1983		Third of the seven protocols of the UNEP Mediterranean Action Plan (MAP) for the Barcelona Convention (BC) legal framework. Eliminates the inputs of Annex I toxic, persistent and bio-accumulating substances, through the use of regional plans and programmes; and regulates regimes for point source discharges and releases into water or air	To prevent, reduce, combat and, as far as possible, eliminate pollution in the Mediterranean Sea	
[94] Mediterranean 1976	Protocol for the Prevention and Elimination of Pollution in the Mediterranean Sea by Dumping from Ships and Aircraft, adopted in 1976; in force, but 1995 amendments not yet in force		First of the seven protocols of the UNEP Mediterranean Action Plan (MAP) for the Barcelona Convention (BC) legal framework	To reduce pollution in the Mediterranean Sea and protect and improve the marine environment in the area, thereby contributing to its sustainable development	
[95] Mediterranean 1976	Protocol Concerning Cooperation in Combating Pollution of the Mediterranean		Second of the seven protocols of the UNEP Mediterranean Action Plan (MAP) for the Barcelona Convention (BC) legal framework	To reduce pollution in the Mediterranean Sea and protect and improve the marine environment in the area, thereby	

	Sea by Oil and other Harmful Substances in Cases of Emergency (Emergency Protocol); adopted on 16 February 1976, in force since 12 February 1978			contributing to its sustainable development	
[96] Mediterranean 1976	[95] Barcelona Convention (BC), adopted 16 February 1976, in force since 12 February 1978		Institutional framework that promotes the adoption of detailed Protocols and facilitates their implementation (e.g. by establishing provisions on monitoring, reporting, public participation, compliance control and dispute resolution)	Overarching goal: To reduce pollution in the Mediterranean Sea and protect and improve the marine environment in the area, thereby contributing to its sustainable development. Specific goals (protocols): (1) To prevent, reduce, combat and, as far as possible, eliminate pollution in the Zone of the Mediterranean Sea; (2) to attain the objective of sustainable development; (3) To protect the environment and to contribute to sustainable development; (4) To promote the integrated management of coastal zones, taking into account the protection of zones of ecological and landscape interest and the rational use of natural resources; (5) To apply the Convention and its Protocols; (6) To formulate and adopt Protocols that prescribe agreed	

				measures, procedures and regulations to apply the Convention; (7) To promote, within the relevant international bodies, measures relating to the application of sustainable development programmes and environmental protection, conservation and rehabilitation and the natural resources of the Mediterranean Sea	
[86b] Mediterranean 1976	Convention for the Protection Of The Mediterranean Sea Against Pollution - Barcelona Convention of 16 Feb 1976, in force since 12 Feb 1978 (revised on 10 Jun 1995 as the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean)			(1) To prevent, abate, combat and to the fullest possible extent eliminate pollution of the Mediterranean Sea Area; (2) to protect the marine environment and the natural resources of the Mediterranean Sea Area as a part of sustainable development	
[M2] Mediterranean	Fisheries Mediterranean Regulation				Some topics (legal trawl sites)
[103a] European	Biodiversity Strategy 2020		Encompasses the Directive 2009/147/EC (Birds Directive) (OJ L 20, 26 Gen 2010, p. 7–25)	Protection of biodiversity and halt of biodiversity loss within the EU by 2020	
[103b] European	Directive 2009/147/EC (Birds Directive) (OJ L		Under the Biodiversity Strategy 2020, it protects and restores the habitats of the bird	(1) Bans activities that directly threaten birds, such as the deliberate killing or capture of	

2009	20, 26 Gen 2010, p. 7–25)		species listed in the annexes	birds, the destruction of their nests and taking of their eggs, and associated activities such as trading in live or dead birds, with a few exceptions; (2) Manages (legitimate) hunting of some species, provided that this practice is sustainable; (3) Requires Member States to outlaw all forms of non-selective and large scale killing of birds; and (4) promotes research to underpin the protection, management and use of all species of birds covered by the Directive	
[104] European 2009	Resolution 2009/89/CE of 4 Dec 2008 (OJ L 34 of 4 Feb 2009 p. 17-18)	European Council	Signature of the protocol about ICZM in the Mediterranean by the EU, in line with the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (revised text of the Barcelona Convention)	(1) To assess and control marine pollution to ensure sustainable management of natural marine and coastal resources; (2) to integrate the environment in social and economic development; (3) to protect the marine environment and coastal zones through prevention and reduction of pollution, and as far as possible, elimination of pollution, whether land or sea-based; (4) to protect the natural and cultural heritage; (5) to strengthen solidarity among Mediterranean coastal States; (6) to contribute to	

				improvement of the quality of life	
[105] European 2008	Council Regulation (EC) no. 1005/2008 of 29 Sep 2008 (OJ L 286 , 29/10/2008 p. 0001–0032)		Under the Common Fisheries Policy (CFP), it establishes a Community system to prevent, deter and eliminate illegal, unreported and unregulated fishing, amending Regulations (EEC) No 2847/93, (EC) No 1936/2001 and (EC) No 601/2004 and repealing Regulations (EC) No 1093/94 and (EC) No 1447/1999	To prevent, deter and eliminate illegal, unreported and unregulated fishing	
[106] European 2008	Commission Decision 2008/949/EC of 6 Nov 2008 (OJ L 346 of 23/12/2008 p. 0037–0088)		Under the Common Fisheries Policy (CFP) , it adopts a multiannual Community programme pursuant to Council Regulation (EC) No 199/2008 establishing a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the CFP	(1) To establishing a Community framework for the collection, management and use of data in the fisheries sector; and (2) to support for scientific advice regarding the CFP	
[107] European 2008	Resolution 2008/335/CE of the Commission of 28 Mar 2008 (OJ L 123, of 8 May 2008, p. 76-153)		Adoption of the first list of SACs for the Mediterranean biogeographic region, in line with Directive no. 92/43/CEE (notified as no. C(2008) 1148)	Protection of biodiversity and halt of biodiversity loss within the EU (actually by 2020)	
[108] European 2008	Council Regulation (EC) No 199/2008 of 25 Feb 2008 (OJ L 060 , 05/03/2008 p. 0001–0012)		Under the Common Fisheries Policy (CFP), it concerns the establishment of a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the CFP	(1) Collection, management and use of data in the fisheries sector; and (2) support for scientific advice regarding the CFP	

[109] European 2008	Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 (Marine Strategy Framework Directive, MSFD) (OJ L 164, 25 Jun 2008, p. 19–40)		Establishes a framework within which Member States shall take the necessary measures to achieve or maintain good environmental status in the marine environment by the year 2020 at the latest. Each Member State shall develop a strategy for its marine waters consisting of preparation (initial assessment, determination of good environmental status, establishment of environmental targets and monitoring programmes) and programmes of measures	(1) To protect and preserve the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they have been adversely affected; and (2) to prevent and reduce inputs in the marine environment, with a view to phasing out pollution as defined in Article 3(8), so as to ensure that there are no significant impacts on or risks to marine biodiversity, marine ecosystems, human health or legitimate uses of the sea	
[109b] 2007	Commission Recommendation of 13 June 2007, notified under document number C(2007) 2551 (OJ L 159, 20/06/2007, p. 45-47)		Identifies a set of actions for the enforcement of Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade in these species by establishing conditions for their importation, exportation or re-exportation and on their movement within the European Union (EU), in accordance with the CITES Convention	To ensure the protection and conservation of endangered species of wild fauna and flora	
[110] European 2007	Council Regulation (EC) No 708/2007 of 11 June 2007 (OJ L 168 , 28/06/2007 p. 0001–0017)		Under the Common Fisheries Policy (CFP), it concerns use of alien and locally absent species in aquaculture	(1) To regulate the use of alien and locally absent species in aquaculture	
[111] European	Commission Regulation (EC) No 498/2007 of 26 March 2007		Under the Common Fisheries Policy (CFP), it lays down detailed rules for the	To implement the European Fisheries Fund	

2007	(OJ L 120 , 10/05/2007 p. 0001-0080)		implementation of Council Regulation (EC) No 1198/2006 on the European Fisheries Fund		
[111b] European 2007	Commission Recommendation No 2007/425/EC		Identifies a set of actions for the enforcement of Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein (CITES)	See [87]	
[111c] 2006	Council Regulation (EC) No. 1967/2006 of 21 Dec 2006 (OJ L 409, 30/12/2006 p. 11-85)		Management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea, amending Regulation (EEC) No. 2847/93 and repealing Regulation (EC) No. 1626/94. Extends its provisions to the Mediterranean High Sea for vessels under EU flags and EU citizens, including protection of species included in the Habitat Directive 92/43/EEC of 21 May 1992	(1) Protection of areas of aggregation of juveniles; (2) prohibition or strict regulation of harmful fishing gear; (3) reduction of the amount of discards; (4) management of fishing effort as the key to deliver sustainable fisheries; (5) protection of nursery and sensitive habitats; (6) enhance the social sustainability of Mediterranean fisheries; and (7) to ensure that leisure fishing does not interfere with commercial fishing and sustainable exploitation of fisheries; (8) establishes fishing protected areas within and beyond territorial seas	
[112] European 2006	Council Regulation (EC) No 1198/2006 of 27 July 2006 (OJ L 223 , 15/08/2006 p. 0001–0044)		Under the Common Fisheries Policy (CFP), it concerns the European Fisheries Fund	To implement the European Fisheries Fund	
[112b]	1083/2006 of 11 July 2006 repealing		Lays down general provisions on the European Regional	Convergence, Regional Competitiveness and Employment and	

	Regulation (EC) No 1260/1999		Development Fund, the European Social Fund and the Cohesion Fund. This Regulation: defines the context for cohesion policy (including cohesion, growth and employment); defines the objectives to which the Structural Funds and the Cohesion Fund are to contribute; defines the criteria Member States and regions must meet to be eligible for the Funds; defines the financial resources available and the criteria for allocating them; defines the principles and lays down the rules on partnership, programming, evaluation, management, monitoring and inspection	Territorial Cooperation: To strengthen economic and social cohesion in order to promote the harmonious, balanced and sustainable development of the European Union (EU) regions for the period 2007-2013. European cohesion policy aims to respond to the challenges linked to economic, social and territorial inequalities, the acceleration of economic restructuring and the ageing of the population	
[112b] 2006	Commission Regulation (EC) No 865/2006 of 4 May 2006 (OJ L 166, 19/06/2006, p. 1-69)		It lays down detailed rules concerning the implementation of Council Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade (CITES implementation)	See [87]	
[113] European 2006	Council Regulation (EC) No 861/2006 of 22 May 2006 (OJ L 160 , 14/06/2006 p. 0001-0011; Official Journal L 294 , 25/10/2006 p. 0201-0211)		Under the Common Fisheries Policy (CFP), it establishes Community financial measures for the implementation of the common fisheries policy and in the area of the Law of the Sea	To implement financial measures to promote the Common Fisheries Policy	
[114a]	Resolution of	European	It carries into effect	To establish a list of	

European 2006	the EU Commission 2006/613/CE of 19 Jul 2006 (OJ L259 of 21 Sep 2006)	Commission	the Directive 92/43/CEE and therefore adopts the list of SACs for the Mediterranean biogeographic region (notified as no. C(2006) 3261)	Specially Protected Areas in the Mediterranean biogeographic region	
[115a] European 2005	Council Regulation (EC) No 768/2005 of 26 April 2005 (OJ L 128 , 21/05/2005 p. 0001-0014; Official Journal L 164 , 16/06/2006 p. 0036-0049)		Under the Common Fisheries Policy (CFP), it establishes a Community Fisheries Control Agency and amending Regulation (EEC) No 2847/93 establishing a control system applicable to the common fisheries policy	To establish a control system for the Common Fisheries Policy	
[115b] 2005	Council Framework Decision 2005/667/JHA of 12 July 2005 (OJ L 255, 30.9.2005, p. 164–167)		Strengths the criminal-law framework for the enforcement of the law against ship-source pollution	Legal enforcement of environmental protection	
[115c] European 2005	Commission Decision 2005/629/EC of 26 August 2005 (OJ L 225 , 31/08/2005 p. 0018-0022)		Under the Common Fisheries Policy (CFP), it establishes a Scientific, Technical and Economic Committee for Fisheries	To establish a control system for the Common Fisheries Policy	
[115d] 2005	Directive 2005/35/EC of the European Parliament and of the Council of 7 September 2005 (OJ L 255, 30/09/2005, p. 11-21)		On ship-source pollution and on the introduction of penalties for infringements	To ensure a high level of safety and environmental protection in relation to maritime transport	
[116] European 2004	Council Regulation (EC) No 1415/2004 of 19 July 2004 (OJ L 258 , 05/08/2004 p. 0001-0005; OJ L 142 , 30/05/2006 p.		Under the Common Fisheries Policy (CFP), it fixes the maximum annual fishing effort for certain fishing areas and fisheries	To fix the maximum annual fishing effort for certain fishing areas and fisheries	

	0185-0189)				
[116b] 2004	Council Decision 2004/815/EC of 19 November 2004 (OJ L 357, 2 Dec 2004 p. 30)		Amends the Declaration 98/416/EC of 16 June 1998 (OJ L 190, 04/07/1998 p. 34-35) on the exercise of competence and voting rights submitted to the General Fisheries Commission for the Mediterranean	To adopt GFCM recommendations as binding principles	
[117] European 2004	Council Regulation (EC) No 812/2004 of 26 April 2004 , in force (OJ L 150, 30 Apr 2004, p. 12-31)		Requires pelagic trawl (single and pair) fisheries to be monitored from 1 January 2005 and keep record of incidental catches of cetaceans, it amends Regulation (EC) No 88/98	To establish monitoring of pelagic trawl and tracking of incidental catches of cetaceans	
[118] European 2004	Council Decision 2004/585/EC of 19 July 2004 (OJ L 256 , 03/08/2004 p. 0017-0022; Official Journal L 142 , 30/05/2006 p. 0176-0181)		Under the Common Fisheries Policy (CFP), it establishes Regional Advisory Councils under the Common Fisheries Policy	To establish an advisor system for the Common Fisheries Policy	
[119] European 2004	Council Decision 2004/575/EC of 29 April 2004 (OJ L 261, 6 Aug 2004, p. 40–40)		Conclusion (adoption as law), on behalf of the European Community, of the Protocol to the Barcelona Convention for the Protection of the Mediterranean Sea against Pollution, concerning cooperation in preventing pollution from ships and, in cases of emergency, combating pollution of the Mediterranean Sea	To reduce pollution in the Mediterranean Sea and protect and improve the marine environment in the area, thereby contributing to its sustainable development	
[120] European 2004	Council decision 2004/465/EC of 29 Apr 2004 (OJ L 157 ,		Under the Common Fisheries Policy (CFP), it regards a Community financial contribution towards	To establish a control system for the Common Fisheries Policy	

	30/04/2004 p. 0114-0135)		Member States fisheries control programmes		
[121] European 2004	Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 (Official Journal L 143 , 30 Apr 2004, p. 0056–0075)		Establishment of a framework of environmental liability based on the 'polluter-pays' principle, aimed to prevent and remedy environmental damage, including damage to protected species and natural habitats	To prevent and remedy environmental damage, including damage to protected species and natural habitats	
[122] European 2002	Council regulation (EC) No. 2371/2002 of 20 Dec 2002 (OJ L 358, 31 Dec 2002, p. 59-80)		Under the Common Fisheries Policy (CFP), it concerns the conservation and sustainable exploitation of fisheries resources. Powers and duties to EC institutions regarding fisheries conservation (coupled with integration of environmental protection requirements) as well as to Member States (coupled with the access restriction in the case of waters within 12 nm of coastal Member States' baselines)	(1) Conservation of fisheries; (2) sustainable exploitation of fisheries resources; (3) environmental protection; and (4) access restriction in the case of waters within 12 nm of coastal Member States' baselines	
[122b] 2002	Regulation (EC) No. 2099/2002 of the European Parliament and of the Council of 5 November 2002 (OJ L 324, 29/11/2002, p. 1-5)		Establishes a Committee on Safe Seas and the Prevention of Pollution from Ships (COSS) and amending the Regulations on maritime safety and the prevention of pollution from ships	(1) To ensure human safety on board; and (2) to prevent marine pollution from ships	
[123] European 2002	Rec. 2002/413 CE of 30 May 2002 (OJ L 148/24 of 6 Jun 2002)	European Parliament & European Council	It calls to carry into effect ICZM in Europe	To carry into effect ICZM in Europe	
[124]	Council Decision		Under the Common Fisheries Policy (CFP),	To implement control, inspection and	

European 2001	2001/431/EC of 28 May 2001 (OJ L 154, 09/06/2001 p. 0022-0040)		on a financial contribution by the Community to certain expenditure incurred by the Member States in implementing the control, inspection and surveillance systems applicable to the common fisheries policy	surveillance systems applicable to the common fisheries policy	
[125] European 2001	Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 (Strategic Environmental Assessment Directive, SEAD) (OJ L 197, 21 Jul 2001, p. 30–37)		To ensure that plans, programmes and projects likely to have significant effects on the environment are made subject to an environmental assessment, prior to their approval or authorisation	(1) To provide a high level of protection of the environment; and (2) to reduce the environmental impact of projects, plans and programmes	
[125b] European 2000	Decision No. 2850/2000/EC of the European Parliament and of the Council of 20 December 2000 (OJ L 332, 28/12/2000, p. 1-6)		Set up a Community framework for cooperation in the field of accidental or deliberate marine pollution, but excluding authorised discharges and continuous streams of pollution originating from land-based sources	(1) Protection of the marine environment, coastlines and human health against the risks of accidental or deliberate pollution at sea, excluding continuous streams of pollution originating from land-based sources; (2) to improve response in case of incidents involving spills or imminent threats of spills of oil or other harmful substances at sea and also to contribute to the prevention of the risks; (3) to strengthen the mutual assistance and cooperation between Member States in this field; and (4) to promote cooperation between Member States in order to provide for	

				compensation for damage in accordance with the polluter-pays principle	
[125c] European 2000	Regulation (EC) No 1655/2000 of the European Parliament and of the Council of 17 July 2000 (OJ L 192, 28/07/2000, p. 1-10)		Concerns the Financial Instrument for the Environment (LIFE) to contribute to the implementation of Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds, Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora and, in particular, the Natura 2000 European network established by the latter Directive	To contribute to the implementation, updating and development of Community environment policy and of environmental legislation, in particular as regards the integration of the environment into other policies, and to sustainable development in the Community through funding of nature conservation projects	
[126] European 2000	Council Regulation (EC) No 1543/2000 of 29 Jun 2000 (OJ L 176 , 15/07/2000 p. 0001-0016)		Under the Common Fisheries Policy (CFP) , it establishes a Community framework for the collection and management of the data needed to conduct the common fisheries policy	Collection and management of the data needed to conduct the common fisheries policy	
[127] European 2000	Council Regulation (EC) No 657/2000 of 27 March 2000 (OJ L 080 , 31/03/2000 p. 0007-0008)		Under the Common Fisheries Policy (CFP), on closer dialogue with the fishing sector and groups affected by the common fisheries policy	Enhance communication with the fishing sector and groups affected by the common fisheries policy	
[128] European 2000	Council Regulation (EC) No 104/2000 of 17 December 1999 (OJ L 017 , 21/01/2000 p. 0022-0052)		Under the Common Fisheries Policy (CFP), on the common organisation of the markets in fishery and aquaculture products	To establish a common organisation of the markets in fishery and aquaculture products	
[129] European 2000	Directive 2000/60/EC (Water Framework Directive, WFD) (OJ L 327,		Establishes a Community framework for water protection and management. Member States must identify	Overarching goal: To achieve “good ecological and chemical status” for all Community waters by 2015. Specific	

	22/12/2000, p. 1-72)		and analyse European waters, on the basis of individual river basin and district. Then they shall then adopt management plans and programmes of measures adapted to each body of water (including coastal waters)	objectives: (1) preventing and reducing pollution; (2) promoting sustainable water usage; (3) environmental protection; (4) improving aquatic ecosystems ; and (5) mitigating the effects of floods and droughts	
[130] European 1999	Council Decision 1999/802/EC of 22 October 1999 (OJ L 322, 14.12.1999, p. 32–33)		Acceptance of amendments to the Convention for the Protection of the Mediterranean Sea against Pollution and to the Protocol for the Prevention of Pollution by Dumping from Ships and Aircraft (Barcelona Convention)	To reduce pollution in the Mediterranean Sea and protect and improve the marine environment in the area, thereby contributing to its sustainable development	
[131] European 1999	Council Decision 1999/801/EC of 22 October 1999 (OJ L 322, 14.12.1999, p. 18–31)		Accepts the amendments to the Protocol for the protection of the Mediterranean Sea against pollution from land-based sources (Barcelona Convention)	To reduce pollution from land-based sources in the Mediterranean Sea and protect and improve the marine environment in the area, thereby contributing to its sustainable development	
[132] European 1999	Council Decision 1999/800/EC of 22 October 1999 (OJ L 322, 14.12.1999, p. 1–2)		Concludes (adopts as law) the Protocol concerning specially protected areas and biological diversity in the Mediterranean, and on accepting the annexes to that Protocol (Barcelona Convention)	To halt and reverse biodiversity loss in the Mediterranean Sea and protect and improve the marine environment in the area, thereby contributing to its sustainable development	
[132b] European 1999	Protocol concerning specially protected areas and biological diversity in the Mediterranean (OJ L 322,			(1) To protect, preserve and manage in a sustainable and environmentally sound way areas of particular natural or cultural value, notably by the establishment of specially protected	

	14.12.1999, p. 3–17)			areas (SPAs); (2) To protect, preserve and manage threatened or endangered species of flora and fauna. SPAs are aimed (2.1) to safeguard representative types of coastal and marine ecosystems of adequate size to ensure their long-term viability and to maintain their biological diversity; (2.2) to safeguard habitats which are in danger of disappearing in their natural area of distribution in the Mediterranean or which have a reduced natural area of distribution as a consequence of their regression or on account of their intrinsically restricted area; (2.3) to safeguard habitats critical to the survival, reproduction and recovery of endangered, threatened or endemic species of flora or fauna; (2.4) to safeguard sites of particular importance because of their scientific, aesthetic, cultural or educational interest	
[133] Europea n 1999	Commission Decision 1999/478/EC of 14 July 1999 (OJ L 187 , 20/07/1999, p. 0070-0073)		Under the Common Fisheries Policy (CFP), it renews the Advisory Committee on Fisheries and Aquaculture (notified under document number C(1999) 2042)	Renovation of the Advisory Committee on Fisheries and Aquaculture	
[134]	Council		Concerns the approval,	To promote	

European 1998	Decision of 21 December 1998 (OJ L 358, 31.12.1998)		on behalf of the Community, of amendments to Appendices II and III to the Bern Convention on the conservation of European wildlife and natural habitats adopted at the 17th meeting of the Convention's Standing Committee	cooperation between the signatory States in order to conserve wild flora and fauna and their natural habitats and to protect endangered migratory species	
[134b] European 1998	Council Decision 98/416/EC of 16 June 1998 (OJ L 190, 04/07/1998 p. 34-35) as amended by Council Decision 2004/815/EC of 19 November 2004 (OJ L 357, 2 Dec 2004 p. 30)		Accession of the European Community to the General Fisheries Commission for the Mediterranean	To adopt GFCM recommendations as binding principles	
[134c] European 1998	Council Decision 98/392/EC of 23 March 1998 (OJ L 179, 23/06/1998 p. 1-2)		Concerns the conclusion by the European Community of the United Nations Convention of 10 December 1982 on the Law of the Sea (UNCLOS) and the Agreement of 28 July 1994 relating to the implementation of Part XI thereof	Conservation and management of the living resources of the high seas	
[134e] European 1997	Council Directive 97/11/EC of 3 March 1997 (OJ L 73, 14/03/1997, p. 5-15)		Amends Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment	To the assessment of the environmental effects of those public and private projects which are likely to have significant effects on the environment	
[134d] European 1996	Council Regulation (EC) No 338/97 of 9 December 1996 (OJ L 061,		On the protection of species of wild fauna and flora by regulating trade therein	See [87]	

	03/03/1997 p. 1-69)				
[134f] European 1996	Council Decision 96/428/EC of 25 June 1996 (OJ L 177, 16/07/1996, p. 24-25)		On acceptance by the Community of the Agreement to promote compliance with international conservation and management measures by fishing vessels on the high seas	To promote compliance with international conservation and management measures by fishing vessels on the high seas	
[135] European 1994	Council Regulation (EC) No 1627/94 of 27 June 1994 (OJ L 171 , 06/07/1994 p. 0007-0013)		Under the Common Fisheries Policy (CFP), it Lays down general provisions concerning special fishing permits	To regulate special fishing permits	
[136] European 1994	Council Regulation (EC) No 1626/94 of 27 June 1994 (OJ L 171, 06/07/1994, p. 1–6)		Technical measures for the conservation of fishery resources in the Mediterranean	Conservation of fishery resources in the Mediterranean	
[137] European 1993	Council Regulation (EEC) No 2847/93 of 12 October 1993 (OJ L 261 , 20/10/1993 p. 0001-0016)		Under the Common Fisheries Policy (CFP), it establishes a control system applicable to the common fisheries policy	To implement control, inspection and surveillance systems applicable to the common fisheries policy	
[137c] European 1993	Council Decision 93/626/EEC of 25 October 1993 (OJ L 309, 13/12/1993, p. 1-2)		Conclusion of the Convention on Biological Diversity	(1) Conservation of biological diversity; (2) sustainable use of its components; and (3) fair and equitable sharing of the benefits arising out of the utilization of genetic resources	
[137f] European 1992	Council Regulation (EEC) No 3760/92 of 20 December 1992 (OJ L 389, 31.12.1992, p. 1–14)		Establishes a Community system for fisheries and aquaculture	To establish a framework for the conservation and protection of fishing resources	
[137d]	Council Regulation		Establishes a financial instrument for the	To contribute to the implementation,	

European 1992	(EEC) No 1973/92 of 21 May 1992 (OJ L 206, 22/07/1992, p. 1-6) as amended by EC Regulation 1655/200		environment (LIFE)	development and enhancement of Community environmental policy and legislation	
[137e] European 1992	Council Regulation (EEC) No 345/92 of 27 January 1992 (OJ L 42, 18.2.1992, p. 15–23)		Lays down certain technical measures for the conservation of fishery resources, amending for the eleventh time Regulation (EEC) No 3094/86	To regulate the use and the length of driftnets (limited to 2.5 km) in EEC waters	
[138] European 1992	Directive 92/43/CEE (Habitats Directive) of 21 May 1992 (OJ L 206, 22 Jul 1992, p. 7-50)	European Council	Under the Biodiversity Strategy 2020, it concerns the conservation of habitats listed in Annex I, and wild fauna and flora species listed in Annex II, as well as any marine special protection areas established under the EC Birds Directive	(1) Conservation of habitats listed in Annex I; (2) conservation of wild fauna and flora species listed in Annex II; and (3) to conservation of any marine special protection areas established under the EC Birds Directive	
[138b] European	Treaty establishing the European Community, consolidated text (OJ C 325, 24/12/2002, p. 1-331)		Protection of the environment constitutes one of the essential objectives of the Community under the Treaty; in particular arts. 174 to 176 EC define the framework within which Community environmental policy must be carried out	(1) Preserving, protecting and improving the quality of the environment; (2) protecting human health; (3) prudent and rational utilisation of natural resources; and (4) promoting measures at international level to deal with regional or worldwide environmental problems	
[138c] European 1991	Council Regulation 563/91/EEC of 4 March 1991 (OJ L 332, 03/12/1991)		On the Community Action for the Protection of the Environment in the Mediterranean (MEDSPA). Start date:1991-03-09; end date:1992-07-23. This	(1) To intensify efforts to protect and improve the quality of the Mediterranean environment; (2) to increase the effectiveness of Community	

			programme is repealed by Council Regulation (EEC) No 1973/92 of 21.5.1992 establishing the LIFE financial instrument	environment policy and measures in the region; (3) to integrate cooperation and coordination at regional, national, Community and international level; (4) to encourage the transfer of appropriate technologies; (5) and to help make the environmental dimension a more integral part of Community policies	
[139] European 1989	Council Decision 89/631/EEC of 27 November 1989 (OJ L 364 , 14/12/1989 p. 0064-0067)		Under the Common Fisheries Policy (CFP), on a Community financial contribution towards expenditure incurred by Member States for the purpose of ensuring compliance with the Community system for the conservation and management of fishery resources	To support economically the Common Fishery Policy for the conservation and management of fishery resources	
[140] European 1985	Directive 85/337/EEC of 27 June 1985, as amended (Environmental Impact Assessment Directive, EIAD) (OJ NO. L 175 , 05 Jul 1985 p. 0040–0048)		To ensure that plans, programmes and projects likely to have significant effects on the environment are made subject to an environmental assessment, prior to their approval or authorisation	To provide a high level of protection of the environment; and (2) to reduce the environmental impact of projects, plans and programmes	
[140b] European 1984	Council Directive 84/631/EEC of 6 December 1984 (OJ L 326, 13.12.1984, p. 31–41)		On the supervision and control within the European Community of the transfrontier shipment of hazardous waste	(1) Protection of human health; and (2) protection of the environment	
[141] European 1984	Council Decision 84/132/EEC of 1 March 1984 (OJ L 68, 10.3.1984, p.		Concludes (adopts as law) the Protocol concerning Mediterranean specially protected areas	To safeguard: (1) representative types of coastal and marine ecosystems of adequate size to ensure their long-term	

	36–37)			viability and to maintain their biological diversity; (2) habitats which are in danger of disappearing in their natural area of distribution in the Mediterranean or which have a reduced natural area of distribution as a consequence of their regression or on account of their intrinsically restricted area; (3) habitats critical to the survival, reproduction and recovery of endangered, threatened or endemic species of flora or fauna; and (4) sites of particular importance because of their scientific, aesthetic, cultural or educational interest	
[141b] European 1983	Commission Regulation (EEC) No 3418/83 of 28 November 1983 (OJ L 344, 07/12/1983 p. 1-27)		Lays down provisions for the uniform issue and use of the documents required for the implementation in the Community of the Convention on international trade in endangered species of wild fauna and flora	See [87]	
[142] European 1983	Council Decision 83/101/EEC of 28 February 1983 (OJ L 67, 12.3.1983, p. 1–2)		Concludes (adopts as law) the Protocol for the protection of the Mediterranean Sea against pollution from land-based sources	Aim: to reduce pollution from land-based sources in the Mediterranean Sea and protect and improve the marine environment in the area, thereby contributing to its sustainable development	
[142b]	Council		On the	See [87]	

European 1982	Regulation (EEC) No 3626/82 of 3 December 1982 (OJ L 384, 31/12/1982, p. 1-61)		implementation in the Community of the Convention on international trade in endangered species of wild fauna and flora		
[142c] European 1982	Council Decision 82/461/EEC of 24 June 1982 (OJ L 210, 19/07/1982 p. 10-22)		On the conclusion of the Convention on the conservation of migratory species of wild animals	See [87]	
[143b] European 1981	Council Decision 81/971/EEC of 3 December 1981 (OJ L 355, 10.12.1981, p. 52–55)		Establishes a Community information system for the control and reduction of pollution caused by hydrocarbons discharged at sea	Reduction of pollution caused by hydrocarbons discharged at sea	
[144] European 1981	Council Decision 81/420/EEC of 19 May 1981 (OJ L 162, 19.6.1981, p. 4–13)		Concludes (adopts as law) the Protocol concerning cooperation in combating pollution of the Mediterranean Sea by oil and other harmful substances in cases of emergency	Aim: to reduce pollution in the Mediterranean Sea and protect and improve the marine environment in the area, thereby contributing to its sustainable development	
[144b] European 1981	Council Regulation (EEC) No 348/81 of 20 January 1981 (Cetaceans) (OJ L 39, 12.2.1981, p. 1–3)		Requires a licence for imports of whale parts and products and prohibited the issue of such a licence for products used for commercial purposes after January 1982	Protection of cetaceans	
[145] European 1980	Council declaration of 30 May 1980 (OJ C 158 , 27/06/1980 p. 0002-0002)		On the Common Fisheries Policy (CFP)	Specific objectives of CFP are: (1) protection of stocks against over-fishing; (2) guaranteed incomes for fishermen; (3) regular supply at reasonable prices for consumers and the processing industry; and (4) sustainable biological, environmental and	

				economic exploitation of living aquatic resources	
[143] European 1979	Council Decision 82/72/EEC of 3 December 1981 (Convention on the Conservation of European Wildlife and Natural Habitats, Bern Convention of 19 September 1979) in force since 1 June 1982 (OJ L 38, 10.02.1982, p. 1-2)		Conclusion by the Community of the Bern Convention on the Convention on the Conservation of European Wildlife and Natural Habitats	To ensure the conservation of European wildlife and natural habitats by means of cooperation between States. (1) Conservation of wild flora and fauna, and their natural habitats; (2) to plan and develop policies, and measures against pollution; (3) education and dissemination of general information on the need to conserve species of wild flora and fauna and their habitats; (4) co-ordination of research related to the purposes of the Convention; (5)international co-operation to enhance the effectiveness of these measures	
[146] European 1979	Directive 79/409/CEE (Conservation of wild birds) of 2 Apr 1979 (OJ L 103, 25/04/1979 p. 1-18)	European Council	Establishment of protection zones, maintenance of habitats, restoration of lost biotopes, generation of biotopes. Habitats of species in Annex I are subjected to special protection measures. General protection status for all bird species	(1) Conservation of bird species; (2) conservation of natural habitats; (3) restoration of biotopes; and (4) generation of biotopes	
[147] European 1977	Council Decision 77/585/EEC of 25 July 1977 (OJ L 240, 19.9.1977, p. 1–2)		Concludes (adopts as law) the Convention for the protection of the Mediterranean Sea against pollution and the Protocol for the prevention of the pollution of the Mediterranean Sea by	To reduce pollution in the Mediterranean Sea and protect and improve the marine environment in the area, thereby contributing to its sustainable development	

			dumping from ships and aircraft		
[147b] European 1976	Council Directive 76/464/EEC of 4 May 1976 (OJ L 129, 18.5.1976, p. 23–29)		On pollution caused by certain dangerous substances discharged into the aquatic environment of the Community. Introduces the concept of list I and list II substances. The purpose is to eliminate pollution from list I substances and to reduce pollution from list II substances	To regulate potential aquatic pollution chemicals produced in Europe, including coastal waters	
[147c] European 1975	Council Directive 76/160/EEC of 8 December 1975 (OJ L 031 , 05/02/1976 p. 1-7)		Concerns the quality of bathing water	(1) To reduce the pollution of bathing water; and (2) to protect such water against further deterioration	
[M3] European	European Convention on the Protection of the Archaeological Heritage				NA
[M4] European	EC/1224/2009 Regulation about VMS				For Maltese VMS
[148] National: Italy 2010	Decree (DM) no. 10988 of 6 Dec 2010		Concludes the Council Regulation (EC) No. 1967/2006 of 21 Dec 2006 with respect to sport and recreational fishing	Monitoring the entity of leisure fishing	
[149] National: Italy 2010	Decree (DL) no. 128 of 20 June 2010	Italian Ministry for the Environment(off-shore platforms), Regional authorities	Conservation issues related to oil exploitation. Defines environmental conservation as goal of the State; introduces sustainable development as an objective for environmental conservation; recall for taking into account	(1) Environmental conservation in the face of oil exploitation; and (2) sustainable development. See [99; 151; 152; 168; 206; 213; 214]	

			international law; regulates Environmental Impact Assessment, Integrated IA and Strategic IA; defines limits for public consultation, diffusion and participation; establish the Italian Ministry of the Environment as authority regarding off-shore platforms		
[150] National : Italy 2010	Decree (DM) no. 715 of 1 Jun 2010 (GU n. 145 of 23 Jun 2010)	Ministry of the environment	Executive regulations of the Egadi MPA	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	Yes
[151] National : Italy 2010	Decree (DM) 29 March 2010	Ministry of economic development – Department of energy – general direction for mineral and energetic resources	Expand the boundaries of the Zone G in the Italian continental shelf off southern Sicily	To extend the area of sea bottom where Italian and European policies about environmental protection from oil apply. See [99; 149; 152; 168; 206; 213; 214]	
[152] National : Italy 2009	Law no. 69 (art. 12) of 18 June 2009	Ministry of the environment	Conservation issues related to oil exploitation	To extend the area of sea bottom where Italian and European policies about environmental protection from oil apply. See [99; 149; 151; 168; 206; 213; 214]	
[153] National : Italy 2009	Decree of 30 Mar 2009 (GU no. 95 of 24 Apr 2009 ordinary suppl. no. 61)	Ministry of the environment and the protection of the territory and the sea	Second list of the SACs for the Mediterranean biogeographic region in Italy, carrying into effect the Directive 92/43/CEE	See [138]	
[154] National : Italy 2009	Decree of 22 Jan 2009 (GU no. 33 of 10 Feb 2009)	Ministry of the environment and the protection of the territory	Modification of the Decree 17 Oct 2007 on the minimum standards for the definition of SACs and	See [138]	

		and the sea	SPAs		
[155] National : Italy 2008	Decree of 3 Jul 2008 (GU no. 184 of 7 Aug 2008)	Ministry of the environment and the protection of the territory and the sea	First list of the SACs for the Mediterranean biogeographic region in Italy, carrying into effect the Directive 92/43/CEE	See [138]	
[156] National : Italy 2008	Resolution of 26 Mar 2008 (GU no. 137 of 13 Jun 2008)	Permanent conference of the relationships between the State and the regions and the autonomous provinces of Trento and Bolzano	Modification of the resolution of 2 Dec 1996 of the Ministry of the environment on the classification of protected areas	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	
[157] National : Italy 2008	Communicatio n (GU no. 68 of 20 Mar 2008)	Ministry of the environment and protection of the territory and the sea	Notification of a government issue dedicated to the managers of the MPAs (and other protected areas as defined in the L. 394/1991 and the fifth update of the list of protected areas) for the realization of projects on the use of “green” energy within protected areas, carrying into effect the DM no. 94 of 22 Feb 2008	(1)Use of removable energies within MPAs	
[158] National : Italy 2008	Communicatio n (GU no. 61 of 12 Mar 2008)	Ministry of the environment and protection of the territory and the sea	Notification of a government issue dedicated to municipalities of minor islands holding MPAs (both projected or in act) as well as municipalities in any other type of protected areas that extend over the sea	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	
[159] National : Italy 2008	Decree (DM) no. 85 of 4 Feb 2008 (GU n. 129 of 4 Jun 2008)	Ministry of the environment and protection of the territory and the sea	Executive regulations of the Pelagie MPA	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138;	Yes

				146]	
[160] National : Italy 2007	Decree 17 Oct 2007 (GU no. 258 of 6 Nov 2007)	Ministry of the environment and protection of the territory and the sea	Standard criteria for the definition of the conservation measures to apply in SACs and SPAs	See [138; 146]	
[161] National : Italy 2007	Decree 5 Jul 2007 (GU no. 170 of 24 Jul 2007 ordinary suppl. no. 167)	Ministry of the environment and protection of the territory and the sea	List of the Italian SACs for the Mediterranean Biogeographic area. It carries into act the Directive 92/43/CEE	See [138]	
[162] National : Italy 2007	Decree 5 Jul 2007 (GU no. 170 of 24 Jul 2007 ordinary suppl. no. 167)	Ministry of the environment and protection of the territory and the sea	List of the Italian SPAs for the Mediterranean Biogeographic area. It carries into act the Directive 79/409/CEE	See [146]	
[163] National : Italy	Government issue - Communicatio n	Ministry of Justice	Lack of turning of the Decree (DL) no. 251 of 16 Aug 2006 into law	See [146]	
[164] National : Italy 2006	Decree (DL) no. 251 of 16 Aug 2006		Urgent dispositions to ensure the alignment of the national law to the European Directive 79/409/CEE for the conservation of the wild fauna. It helps transposition of the European Directive 79/409/CEE (Conservation of wild birds) of 2 Apr 1979	See [146]	
[165] National : Italy 2006	Law no. 248 of 4 Aug 2006		Conversion into law (after modifications) of the DL no. 223 of 4 Jul 2006, which in art. 22 determines a reduction of 10% of the funds dedicated to the management bodies of protected areas	Reduction of 10% of the funds dedicated to the management bodies of protected areas	
[166] National : Italy 2006	Law no. 61 of 8 Feb 2006 (GU no. 52 of 3 Mar 2006)		Establishment of zones of ecological protection off the territorial seas	(1) Environmental conservation in the international high seas; (2) sustainable fisheries in the international high seas	
[167] National : Italy 2005	Decree (DL) no. 203 of 30 Sep 2005 (GU no. 230 of 3 Oct		Provisions against fiscal evasion as well as urgent financial measures. Art 11	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species	

	2005) coordinated with conversion Law no. 248 of 2 Dec 2005 (GU no. 281 of 2 Dec 2005 ordinary suppl. no. 195)		contains modifies to L no. 394 of 6 Dec 1991 about the framework for the establishment and management of natural reserves	protection; (4) environmental education and research. See [138; 146]	
[168] National : Italy 2005	Agreement of 14 Jul 2005 (GU no. 174 of 28 Jul 2005 inventory no. 863/CU)		Agreement (as stated in L. 5 Jun 2003 art 8) on the concession of maritime State properties and zones of sea within MPAs	Concession of maritime State properties and zones of sea within MPAs. See [99; 149; 151; 152; 206; 213; 214]	
[170] National : Italy 2005	Decree of 25 Mar 2005 (GU no. 168 of 21 Jul 2005)	Ministry of the environment and protection of the territory and the sea	List of the Italian SPAs for the Mediterranean Biogeographic area to carry into act the Directive 79/409/CEE (Conservation of wild birds) of 2 Apr 1979. Transposition of the Directive 79/409/EEC: Conservation of birds and their habitats	See [146]	
[169] National : Italy 2005	Decree of 25 Mar 2005 (GU no. 157 of 8 Jul 2005)	Ministry of the environment and protection of the territory and the sea	List of the Italian proposed SACs for the Mediterranean Biogeographic area to carry into act the Directive 92/43/CEE. Transposition of the Directive 92/43/EEC (Habitats Directive) of 21 May 1992	See [138]	
[171] National : Italy 2005	Decree 25 Mar 2005 (GU no. 155 of 6 Jul 2005)	Ministry of the environment and protection of the territory and the sea	Annulation of the communication of the Commission for the natural protected areas of 2 Dec 1996 (published GU no. 139 of 17 Jun 1997): management and conservation of SACs and SPAs	See [138; 146]	
[172] National : Italy 2003	Measure of 24 Jul 2003 (GU no. 205 of 4 Sep 2003 ordinary suppl. no. 144)	Permanent conference for the relationships between the State and the	Fifth update of the official list of protected areas, in line with L. no. 394 of 6 Dec 1991 (art. 3) and D.L. no. 281 of 28 Aug	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental	

		regions and the autonomous provinces of Trento and Bolzano	1997 (art 7)	education and research. See [138; 146]	
[173] National : Italy 2003	Decree (DPR) no. 120 of 12 Mar 2003 (GU no. 124 of 30 May 2003)		Modifies DPR no. 357 of 8 Sep 1997 (GU no. 284 of 23 Oct 1997 ordinary suppl. no. 219/L). Regulations that carry into effect the Directive 92/43/EEC (Habitats Directive) of 21 May 1992. The Sicilian Region is charged to designate sites (special protection zones and special conservation zones) of the Natura 2000 network, as well as to apply conservation and protection measures, including sectoral or integrated management plans	See [138; 146]	
[175] National : Italy 2002	Resolution of 28 Nov 2002 (GU no. 294 of 16 Dec 2002)	Permanent conference for the relationships between the State and the regions and the autonomous provinces of Trento and Bolzano	Adoption of the amendment to the forth update of the official list of natural protected areas, approved by the Conference on 25 Jul 2002 in line with L. no. 394 of 6 Dec 1991 (art. 3) and DL no. 281 of 28 Aug 1997 (art. 7)	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	
[174] National : Italy 2002	Decree (DM) of 21 Oct 2002 (GU n. 14 of 18 Jan 2003)	Ministry of the environment and protection of the territory and the sea	Establishment of the Pelagie MPA	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	Yes
[176] National : Italy 2002	Decree (DM) of 3 Sep 2002	Ministry of the environment and protection of the territory	Framework of main principles for the management of the sites within the Natura 2000 network (which incorporates the Birds	See [138; 146]	

			Directive and the Habitats Directive). It transposes the Directive 92/43/EEC (Habitats Directive) of 21 May 1992		
[177] National : Italy 2002	Law no. 179 of 31 Jul 2002 (GU no. 189 of 13 Aug 2002)		Measures for environmental protection	To allow for changes in the organization of the management bodies of MPAs and institution of a dedicated environmental branch within the Coast Guard, among many other heterogeneous issues	
[178] National : Italy 2002	Resolution no. 1500 of 25 Jul 2002 (GU no. 214 of 12 Sep 2002 ordinary suppl. no. 183)	Permanent conference for the relationships between the State and the regions and the autonomous provinces of Trento and Bolzano	Approbation of the forth list of natural protected areas, approved by the Conference on 25 Jul 2002 in line with L. no. 394 of 6 Dec 1991 (art. 3) and DL no. 281 of 28 Aug 1997 (art. 7)	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	
[179] National : Italy 2002	Government issue - Communicatio n (GU no. 156 of 5 Jul 2002)	Ministry of the environment and protection of the territory	Call for applications for public contributions to fund projects aimed to develop removable energies, energy efficiency and sustainable mobility within Italian protected areas	(1)Use of removable energies; (2) energy efficiency; (3) and sustainable mobility within MPAs	
[180] National : Italy 2001	Decree (DD) no. 982 of 21 Dec 2001 (GU no. 91 of 18 Apr 2002)	Ministry of the environment and protection of the territory	Plan for the diffusion of removable energies, energy efficiency and sustainable mobility within protected areas	(1)Use of removable energies; (2) energy efficiency; (3) and sustainable mobility within MPAs	
[181] National : Italy 2001	Decree (DL) no. 226 of 18 May 2001 (GU no. 137 of 15 Jun 2001, Suppl. Ord. no. 149)		Orientation and modernization of the fisheries and aquaculture sectors, in line with L no. 57 of 5 Mar 2001 (art 5).	(1) To establish management units that are homogeneous from ecological, social and economical points of view; (2) to promote sustainable ways of fisheries exploitation; (3) to increase job opportunities; (4) to conclude the	

				Regulations CEE 4028/86 and CEE n. 2080/93 on the decrease of fishing capacity within 30 Jun 2002; and (5) to facilitate access to credit of the fisheries sector	
[184] National : Italy 2001	Decree of 3 Apr 2000 (GU no. 95 of 22 Apr 200 ordinary suppl. no. 65)		List of the SACs and SPAs. It transposes the Directives 92/43/CEE and 79/409/CEE	See [138; 146]	
[187] National : Italy 2001	Decree (DL) no. 112 of 31 Mar 1998 (GU no. 92 of 21 Apr 1998, Suppl. Ord. no. 77, corrected by GU no. 116 of 21 May 1997 and updated by and coordinated with Decree (DL) no. 343 of 7 Sep 2001		Passage of competences and administrative functions from the State to the Regions and other local bodies, to carry into effect the L. no. 57 of 15 Mar 1997	The local (Sicilian) government is charged with competences to produce management plans regarding nature conservation, environmental protection, water quality and preservation of the natural heritage (except for national parks and reserves)	
[182] National : Italy 2001	Law no. 93 of 23 Mar 2001 (GU no. 79 of 4 Apr 2001)		Updates L. no. 426 of 9 Dec 1998	(1) Establishment of a standard for environmental surveys; (2) To ensure the development of regional agencies for the environment; (3) to update the equipments of environmental laboratories; and (4) to coordinate the environmental information system with the geological information system to produce hydrological risk maps	
[183] National : Italy 2001	Law no. 57 of 5 Mar 2001 (GU no. 66 of 20 Mar 2001)		Provisions on the fisheries and other sectors	(1) To promote the social and economic development of fisheries ensuring the protection of nature, biodiversity and	

				cultural heritage; (2) to develop marine resources including management and protection of the environment, including new economic incomes; (3) to update fishing structures and techniques with low environmental impact, keeping pace with market demand and the protection of the consumer and the environment; (4) to enhance environmental protection; and (5) to promote job occupation in the fisheries sector	
[188] National : Italy 1999	Decree (DL) no. 490 of 29 Oct 1999		Update of and coordination with L no. 431 of 8 Aug 1985 (aka Galasso law) about urgent measures for the protection of areas of particularly high environmental value	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	
[188c] National : Italy 1999	Decree (DM) 14 Sep 1999 (GU n. 31 del 8 Feb 2000)		Regulation of artisanal fishing	To subsidize the artisanal fishing fleet (within 12 nm from the coastline)	
[188b] National : Italy 1999	Decree (DM) no. 293 of 13 Apr 1999 (GU no. 197 of 23 Aug 199) in force since 7 Sep 1999		Regulations on touristic fishing, carrying into effect art. 27bis of L no. 41 of 17 Feb 1982 as amended	See [185e]	
[185] National : Italy 1999	Decree (DM) of 20 Jan 1999		It modifies Annexes I and II in the transposition of the European Directive no. 92/43/CEE (Habitats Directive) of 21 May 1992	See [138]	
[186] National	Law no. 426 of 9 Dec 1998 (GU		New measures for environmental	(1) Institution of a technical department	

: Italy 1998	no. 291 of 14 Dec 1998), updated by and coordinated with Law no. 93 of 23 Mar 2001		protection	for the establishment and update of MPAs within the Ministry of the Environment ; (2) institution of a national program on Posidonia oceanica of 3 years; and (3) management of MPAs endorsed to public entities, research institutions and environmental associations	
[185b] National : Italy 1998	Decree (DPR) no. 445/1998 of 19 Nov 1998 (GU no. 299 of 23 Dec 1998)		Regulations on administrative details in the fisheries sector	To simplify administrative issues regarding fisheries	
[185d] 1998	Decree (DM) of 14 Oct 1998 (GU no. 281 of 1 Dec 1998)		Technical issues for the “ferrettara” gear (a particular type of drifting net for small pelagic fishes)	To regulate and limit the use of a particular type of drifting net for small pelagic fishes	
[185c] 1998	Decree (DM) of 27 Jul 1998 (GU no. 232 of 5 Oct 1998)		On the use of the “totanara” gear	To regulate and limit the use of a particular type of gear for squid Todarodes sagittatus	
[189] National : Italy 1998	Law no. 164 of 21 May 1998 (GU no. 124 of 30 May 1998)		Measures about fishing and aquaculture	To subsidize the fisheries sector during the 1998-2000 period	
[189b] National : Italy 1998	Decree (DM) 16 Jun 1998 (GU no. 156 of 7 Jun 1998)		Regulation to carry into effect short-term stop of fishing activities for trawlers and purse-seiners during 1998	To achieve a temporal reduction of fishing effort in trawlers and purse-seiners during 1998	
[185e] National : Italy 1998	Decree (DM) no. 293 of 13 Apr 1998 (GU no. 131 of 8 Jun 1998)		Modifies decree (DM) of 19 Jun 1992 on regulations to carry into effect L no. 41 of 17 Feb 1982 about touristic fishing	To regulate touristic fishing	
[190] National : Italy 1997	Decree (DPR) no. 357 of 8 Sep 1997 (GU no. 284 of 23 Oct 1997 ordinary suppl. no. 219/L) coordinated		Regulations that carry into effect the European Directives no. 92/43/CEE (Habitats Directive) and no. 79/409/CEE (conservation of wild birds)	See [138; 146]	

	with Decree (DPR) no. 120 of 12 Mar 2003 (GU no. 124 of 30 May 2003)				
[191] National : Italy 1997	Decree (DL) no. 281 of 28 Aug 1997		Suppression of the Commission for the natural protected areas, whose attributions are passed to the Permanent Conference for the relationships between State, the Regions and the autonomous Provinces of Trento and Bolzano. Transposition of the Directive 92/43/EEC (Habitats Directive) of 21 May 1992: Definition of the competent body for conservation of natural habitats and of wild fauna and flora	See [138]	
[191b] National : Italy 1997	Decree (DM) of 31 July 1997 (GU no. 237 of 10 Oct 1997)		On fishing licenses	Establishes a process to authorize or deny the existing fishing gears and places the Ministry to establish a framework of regulations within 31 Jan 1998	
[192] National : Italy 1997	Decree (DL) no. 143 of 4 Jun 1997 (GU no. 129 of 5 Jun 1997)		Passage of administrative functions in agriculture and fisheries from the State to the Regions, as well as reorganization of the central administration	To move administrative powers in fisheries from the central government to local ones (Sicily)	
[193] National : Italy 1996	Communicatio n of the Commission for the natural protected areas of 2 Dec 1996 (published GU no. 139 of 17 Jun 1997)		Includes both zones of special protection and zones of special conservation as types of protected areas. Transposition of the Directive 92/43/EEC (Habitats Directive) of 21 May 1992: Definition of the	See [138]	

			competent body for conservation of natural habitats and of wild fauna and flora		
[193b] National : Italy 1996	Decree (DM) of 28 Aug 1996 (GU no. 237 of 9 Oct 1996)		Regulation of fisheries of fish-fry and transparent goby (Aphia minuta)	To authorize, regulate and limit the fisheries of fish-fry and transparent goby (Aphia minuta)	
[194] National : Italy 1996	Decree (DM) of 17 May 1996 (GU no. 263 of 9 Nov 1996)	Ministry of the environment	Modification of the Egadi MPA	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	Yes
[195] National : Italy 1995	Decree (DM) 26 Jul 1995 (GU no. 203 of 31 Aug 1995)		Regulations for the release of the fishing license	(1) To limit fishing effort; (2) to regulate authorized fishing gears; (3) to diversify fishing effort; (4) to promote the passage from trawling to other fishing methods; (5) to apply Regs. CEE 2930/86 and CEE 2104/93	
[196] National : Italy 1995	Decree (DM) of 15 Jun 1995 (GU no. 209 of 7 Sep 1995)	Ministry of the environment	Annulation of D.M. of 26.07.1994 (G.U. n. 180 of 03.08.1994)	See [138; 146]	No
[197] National : Italy 1994	Decree (DM) of 26 Jul 1994 (GU no. 180 of 3 Aug 1994)	Ministry of the environment	Modification of the Egadi MPA	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	Yes
[198] National : Italy 1994	Law no. 124 of 14 Feb 1994		Ratification and fulfilment of the Biodiversity Convention, with annexes, of Rio de Janeiro on 5 Jul 1992	[See 96]	
[199] National : Italy	Decree (DM) of 6 Aug 1993 (GU no. 199 of 25 Aug 1993	Ministry of the environment	Modification of the Egadi MPA	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species	Yes

1993				protection; (4) environmental education and research. See [138; 146]	
[200] National : Italy 1992	Law 381 of 25 Aug 1992 (GU no. 205 of 1 Sep 1988)		Modifications to the L no. 963 of 14 Jul 1965 about regulations for maritime fishing	See [212; 216]	
[200b] National : Italy 1992	Decree (DM) of 19 Jun 1992 (GU no. 120 of 27 Jun 1992)		Regulations for putting into effect art. 27bis of L no. 41 of 17 Feb 1982 on touristic fishing	See [212]	
[201] National : Italy 1992	Law no. 165 of 10 Feb 1992 (GU no. 48 of 27 Feb 1992)		Modifications and supplements to the L no. 41 of 17 Feb 1982 about the plan for rationalization and development of maritime fishing	See [212]	
[202] National : Italy 1992	Law no. 157 of 11 Feb 1992 (GU no. 46 of 25 Feb 1992 ordinary suppl. no. 41) updated by the Communicatio n of the Ministry of Justice (GU no. 243 of 18 Oct 2006)		Regulates hunting and contains some protection measures for homeothermic species. It partially transposes the European Directive 79/409/CEE (Conservation of wild birds) of 2 Apr 1979	Partial protection measures for homeothermic species. See [146]	
[203] National : Italy 1991	Decree (DI) of 27 Dec 1991	Ministry of the environment	Establishment of the Egadi MPA	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	Yes
[204] National : Italy 1991	Law no. 394 of 6 Dec 1991 (GU of 13 Dec 1991 ordinary suppl. no. 292) coordinated with Law 426 of 9 Dec 1998 and Law no. 93		Framework for the establishment and management of natural reserves; also establish the Commission for the natural protected areas. It transposes the European Directive	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]. See [146]	

	of 23 Mar 2001		79/409/CEE (Conservation of wild birds) of 2 Apr 1979		
[205] National : Italy 1991	Decree (DM) 10 May 1991 (GU no. 136 of 12 Jun 1991)		Establishment of the registry of Italian protected areas	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	
[206] National : Italy 1991	Law no. 9 (art. 4) of 9 January 1991	Ministry of economic development – Department of energy – general direction for mineral and energetic resources; Ministry of the environment	Prohibits extractive activities within 12 nm from the shorelines of the Egadi Islands	Environmental protection from oil extraction. See [99; 149; 151; 152; 168; 213; 214]	
[206b] National : Italy 1988	Law no. 381 of 25 Aug 1988 (GU no. 205 of 1 Sep 1988)	Modifications to the law 963 of 14 Jul 1965 on regulation of maritime fishing		(1) Establishment of the division of the fishing areas in homogeneous management subareas (districts); (2) promotion of educational courses for fishermen on new technologies, aquaculture and environmental issues; and (3) enumerates a number of prohibited fishing behaviours See also [216]	
[207] National : Italy 1987	Decree (DM) no. 250 of 5 Jun 1987 (GU no. 149 of 29 Jun 1987)		Supplement to the art. 87 of the DPR no. 1639 of 2 Oct 1968, which approves the regulations that carry into effect the L no. 963 of 14 Jul 1965, about maritime fisheries	See [216]	
[208] National : Italy	Law no. 431 of 8 Aug 1985 (aka Galasso law) (GU no.		Conversion into law, with modifications, of the DL no. 312 of 27 Jun 1985, about urgent	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species	

1985	197 of 22 Aug 1985) updated by and coordinated with Decree (DL) no. 490 of 29 Oct 1999		dispositions for the protection of areas of particularly high environmental value	protection; (4) environmental education and research. See [138; 146]	
[209] National : Italy 1983	Decree (DM) 21 Apr 1983 (GU no. 116 of 29 Apr 1983)		Modification to the regulations that carry into effect the L no. 963 of 14 Jul 1965 about maritime fisheries	See [216]	
[210] National : Italy 1982	Law no. 979 (art. 31) of 31 Dec 1982 (GU no. 16 of 18 Jan 1983 ordinary suppl.)	Ministry of the environment	Provisions for the defence of the sea. Art. 31 identifies the Egadi MPA and Pelagie MPA	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	Yes
[212] National : Italy 1982	Law no. 41 of 17 Feb 1982 (GU no. 73 of 17 Feb 1982) modified and supplemented by Law 165 of 10 Feb 1992		Plan for rationalization and development of maritime fishing	(1) Establishment of a national fisheries plan; (2) Rational management of maritime biological resources; (3) increase of biological productivity and value of massively fished species; (4) diversification of the demand, rationalization of the market and increase of consumes; (5) increase of the value of fishing products; (6) enhancement of the fishermen's welfare and working conditions; enhancement of the commercial balance of the sector	
[213] National : Italy 1981	Decree (DI) of 26 Jun 1981	Ministry of economic development – Department of energy – general direction for	Defines the boundaries of the Zone G in the Italian continental shelf off southern Sicily	Defines the area of sea bottom where Italian and European policies apply. See [99; 149; 151; 152; 168; 206; 214]	

		mineral and energetic resources			
[214] National : Italy 1978	Law no. 347 of 3 June 1978	Ministry of economic development – Department of energy – general direction for mineral and energetic resources	Execution of the Italy-Tunisia bilateral agreement on the sovereignty of the continental shelf	Defines the area of sea bottom where Italian and European policies apply. See [99; 149; 151; 152; 168; 206; 213]	
[215] National : Italy 1968	Decree (DPR) no. 1639 of 2 Oct 1968 supplemented by DM of 3 Aug 1982 (GU no. 230 of 21 Aug 1982)		Regulations to carry into effect the L no. 963 of 14 July 1965 about maritime fishing	See [216]	
[216] National : Italy 1965	Law no. 963 of 14 Jul 1965 (GU no. 203 of 14 Aug 1965) carried into effect by DPR no. 1639 of 2 Oct 1968 supplemented by DM of 3 Aug 1982		General framework of regulations for maritime fishing	Regulation of maritime fishing	
[M5] National : Malta	Fish Farming Policy Guidelines	MEPA, MAR		Provide advice on applications for the development of aquaculture units	For the fish farms
[M6] National : Malta	Development Planning Act	MEPA	Chapter 356 – any development in aquaculture must have a development permit		No
[M7] National : Malta	Flora, Fauna and Natural Habitats Protection Regulation	MEPA		Habitats and Birds Directive	For some topics
[M8] National : Malta	Antiquities Protection Act	MEPA, Superintendence of Cultural Heritage			no
[M9] National : Malta	Maltese Legal Act: Fisheries Conservation	AFRD, AFM	Legal Notice no 407 of 2004	operations and registration of the fishing fleet	no

	and Management Act				
[M10] National : Malta	Maltese Legal Act: Fisheries Conservation and Management Act	AFRD, AFM	Government Notice 206 of 1934	fishing restricted to certain areas	some
[M11] National : Malta	Government Notice 173 of 1990 (Filfla)	MEPA, AFM			NA
[M12] National : Malta	Environment Protection Act				no
[M13] National : Malta	EC 813/2004 Regulation and EC 1976/2006	MEPA, TM, AFRD, EU?	Maltese Fisheries Management Zone	25NM management zone	yes
[M14] National : Malta	EC 813/2004 Regulation and EC 1976/2006	AFRD, AFM	Trawling zones	Trawlers are only allowed to trawl in specified zones within the 25 NM zone	yes
[M15] National : Malta	Notice to Mariners no 67 of 2004	AFM	Conservation Area off il-Merkanti shoals	Only surface fishing is allowed	Yes
[M16] National : Malta	Notice to Mariners no 5 of 2008	VAFD	Conservation area around wrecks	No stopping areas	Yes
[M17] National : Malta	Notice to Mariners no 6 of 2008	AFM	Protection of Yelkouan Shearwaters	No stopping areas	yes
[M18] National : Malta	Malta travel and tourism services act	MTA, MEPA	Legal Notice 357 of 2010	regarding the licence for diving services	no
[M19] National : Malta	Legal notice 410 of 2007: licence to retain submarine cables and pipelines				no
[M20] National : Malta	Bathing Water Directive and UN Barcelona Convention on the quality of water under LN 380/2003	TM, MTA			Swimming zones yes
[217]	Decree (DA)	Regional office	Establishment of the	See [138; 146]	Yes

Local: Sicily 2010	no. 221 of 31 Dec 2010	of the territory and the environment	Egadi and Pelagie marine SACs [Albeit maps and management plans NA yet]. Makes the regulations of the Natura 2000 network executive in the Egadi and Pelagie SACs		(in correspondence with the boundaries of the MPAs)
[218] Local: Sicily 2007	Law (LR) no. 13 of 8 May 2007 (GURS no. 22 of 11 May 2007)		Promotion of economic activities within SACs and SPAs. Regulations on popular and cooperative building. Measures on the tourism sector. Modifications to the LR no. 10 of 2007	Promotion of economic activities within SACs and SPAs	
[219] Local: Sicily 2007	Decree (Decreto Assessoriale) of 3 Apr 2007	Regional office of the territory and the environment	Transposition of European directives no. 79/409/CEE & no. 92/43/CEE. Extension of the Italian DPR no. 357/97 to include SPAs and SACs as areas subjected to protection. List of the SACs and SPZs within the Sicilian territory.	See [138; 146]	Yes
[220] Local: Sicily 2005	Decree (Decreto Assessoriale) of 21 Feb 2005 (GURS no. 42 of 7 Oct 2005)	Regional office of the territory and the environment	Summary of SACs and SPAs: Egadi MPA; and Linosa, Pantelleria and Lampedusa islands within the study area. It transposes European directives no. 79/409/CEE & no. 92/43/CEE	See [138; 146]	Yes
[221] Local: Sicily 2004	Decree (DD) of 23 Jan 2004 (GU no. 58 of 10 Mar 2004)		Temporal ban of modifiability relative to the Egadi Islands, ex art. 5 of LR no. 15 of 1991	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	
[222] Local: Sicily 2003	Decree 20 Mar 2003 (GU no. 110 of 14 May 2003)		Extension of the temporal ban of modifiability relative to the Egadi Islands	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4)	

				environmental education and research. See [138; 146]	
[223] Local: Sicily 2000	(GURS no. 57 15 Dec 2000)		List of the SACs and SPAs, in line with Directives 92/43/CEE and 79/409/CEE	See [138; 146]	
[224] Local: Sicily 2000	Law (LR) no. 32 of 23 Dec 2000 (GURS no. 61 of 23 Dec 2000)		Provisions to carry into effect the National Operative Plan 2000-2006 and for the reorganization of the system of financial aids to companies	To carry into effect the Reg. CE 1260/1998, implementing the management of funds through the national operative program (PON) 2000-2006	
[225] Local: Sicily 2000	Decree 18 Apr 2000		Establishment of the Linosa and Lampione MPA	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	
[226] Local: Sicily 2000	Decree 3 April 2000 (GURI no. 95 of 22 Apr 2000 ordinary suppl. no. 65)		List of the SACs and SPAs, in line with Directives 92/43/CEE and 79/409/CEE	See [138; 146]	
[227] Local: Sicily 1999	Decree of 30 Dec 1999	Regional office of the territory	Update of the L.R. no. 98 of 6 May 1981: Regulations for the establishment of natural reserves	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	
[228] Local: Sicily 1999	Law (LR) no. 10 of 27 Apr 1999		Update of and coordination with LR no. 71 of 3 Oct 1995: Urgent dispositions about territory and environment	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	
[229] Local: Sicily 1998	Law (LR) no. 33 of 9 Dec 1998 (GURS no. 62 of 12 Dec 1998)		Urgent measures for the fisheries sector	To provide subsides in the fisheries sector for (1) disasters not covered by insurances; (2) unemployment; (3)	

				"consorzi"; (4) families of shipwrecked person; and one fishing vessel identified as "orchidea"	
[229b] Local: Sicily 1998	Law (LR) no. 30 of 26 Oct 1998 (GURS no. 55 of 28 Oct 1998, p. 5)		Legislative measures for pauses and limitations in the fishery sector	To provide subsides for temporal stop (more than 30 days) of fishing units 1998 only (una tantum)	
[230b] Local: Sicily 1996	Law (LR) no. 33 of 18 May 1996 (GURS no. 26 of 21 May 1996)		Urgent legislative measures for the economy. Regulations about business, agriculture, handicraft, job, tourism and fishing. Legislative measures about other matters, modifications and abrogation of regulations	(1) To enlarge the beneficiaries of some subsidies; and (2) to exclude the duty of demolition of some fishing vessels [See 236]	
[231] Local: Sicily 1995	Law (LR) no. 71 of 3 Oct 1995 (GURS no. 51 of 5 Oct 1995)		Urgent measures regarding the territory and the environment	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	
[232] Local: Sicily 1995	Law (LR) no. 71 of 3 Oct 1995 (GURS no. 51 of 5 Oct 1995) updated by and coordinated with LR 10 of 27 Apr 1999		Urgent dispositions about territory and environment	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	
[234] Local: Sicily 1993	Law (LR) no. 15 of 11 May 1993 (GURS no. 24 of 13 May 1993)		Provisions for the production compartments, as well as other dispositions of financial nature and regulations for the reduction rationalization and acceleration of the expenditure	To provide funds for enforcement and monitoring of the fisheries sector	
[235] Local:	Law (LR) no. 25 of 7 August 1990 (GURS no.	Regional office for the cooperation,	Bonus for the construction of non-trawler fishing vessels	Rational management of the biological resources; decrease of	No

Sicily 1990	38 of 11 Aug 1990)	commerce, handicraft and fishing	(art. 1) as well as large trawlers (art. 3); bonus for demolition of fishing vessels (art. 4); indemnities (art. 5); bonus for local governance structures (consorzi) (art. 7); construction of artificial structures aimed at fish production (art. 8); enforcement (art. 10); communication (art. 11); stakeholder engagement (art. 15).	fishing effort; increase of biological production and its economical value; diversification and enhancement of the fish market; enhancement of fishermen conditions; increase of job opportunities in fisheries and aquaculture. In practice, it encourages the passage from small trawling vessels to large trawling vessels as well as other types of fishing and aquaculture activities	
[236] Local: Sicily 1987	Law (LR) no. 26 of 27 May 1987 (GURS no. 22 of 30 May 1987)	Assesorato regionale per la cooperazione, il commercio , l'artigianato e la pesca	Credit facilities and bonus for the construction of non-trawling vessels (art. 2); bonus for the construction and enhancement of non-trawler fishing vessels as well as large trawlers, also reconstruction of previously demolished or wrecked vessels (art. 3); bonus for the demolition of vessels (art. 4); credit facilities and bonus for fishermen cooperatives (art.5, 24, 25); aquaculture and fisheries research (art. 6); decrease of fishing effort and enforcement (art. 8); bonus for the transformation of fishing products; bonus for tuna aquaculture and fishing through fixed nets (tonnare) (art. 12); formation of	Rational management of the biological resources; decrease of fishing effort; increase of biological production and its economical value; diversification and enhancement of the fish market; enhancement of fishermen conditions; increase of job opportunities in fisheries and aquaculture	No

			aquaculture technicians (art. 13); temporal cessation of fishing (art. 14, 15); communication (art. 20); bonus for local governance structures (consorzi) (art. 21);credit facilities and bonus for aquaculture facilities (art. 22, 23); construction of fish markets and port facilities (art. 27, 28) . In practice, it encourages renovation of vessels and the passage from small trawling vessels to large trawling vessels as well as other types of fishing and aquaculture activities		
[239] Local: Sicily 1981	Law (LR) no. 98 of 6 May 1981 (GURS no. 23 of 9 May 1981 ordinary suppl.) updated by and coordinated with Decree of 30 Dec 1999)		Regulations for the establishment of natural reserves	(1) Conservation of natural and cultural heritage; (2) habitat protection; (3) species protection; (4) environmental education and research. See [138; 146]	
[240] Local: Sicily 1980	Law (LR) no. 1 of 4 Jan 1980 (GURS no. 2 of 12 Jan 1980)		Provisions for the rationalization of fishing in Sicily, updated by subsequent laws	General legal framework for the fisheries sector	

Action 1b.3: Defining objectives and assessment of balance

Categorise objectives saying whether it is a socio-economic objective or an ecological objective. It is important that the ecological and socio-economic operational objectives that are chosen for evaluation are considered for how they contribute to a healthy and functioning ecosystem. Fill out table 1b.3 considering this for each goal or operational objective.

(A) Bottom otter trawlers
(B) Dolphinfish Purse Seiners
(C) Lampara Fishery
(D) Tartarun Fishery

Table 1b.3 focusing on fisheries only for malta

Operational objective	Type (socio-economic or ecological?)	Does it contribute to a healthy and functioning ecosystem? Yes/no
[A1] Assessment of the stocks for the most important commercial species	ecological	Yes
[A2] Identification of 'essential fish habitats' for the most important stocks	ecological	Yes
[A3] Identification of current trawling grounds both spatially and temporally	Ecological	Yes
[A4] Using fishing effort as an indicator of trawling pressure	Ecological	Yes
[A5] Identifying the impacts of trawling on the fishing grounds, including the commercial species, non-commercial species and habitats and its relationship to trawling pressure	Ecological	Yes
[A6] Possibility of the relocation of fishing effort and the current authorized trawling grounds	Ecological	Yes
[A7] The supply of continuous information of the state of demersal resources	Ecological	Yes
[A8] Identification and characterization of the biogenesis in territorial waters	Ecological	Yes
[A9] Identification and characterization of habitats listed in the habitats directive especially in trawling grounds	Ecological	Yes
[A10] Characterization of the discards from the trawl fishery in terms of species composition, biomass and density indices	Ecological	Yes
[A11] Identification of incidental captures of any protected species especially in trawling grounds	Ecological	Yes
[A12] Identification of critical habitats for species of bird fauna	Ecological	Yes
[A13] Possibility of introducing mitigating measures for the protection of habitats protected species and reduction of discards	Ecological	Yes
[A14] Development of a monitoring program to monitor the evaluation of the protection measures	Ecological	Yes

[A15] Assess current socio-economic situation of fishery	Socio-economic	No
[A16] Assess likely socio-economic impacts of management measures proposed to manage fishery	Socio-economic	No
[B1] Characterization of the associated species caught together with the dolphinfish in terms of species composition abundance and biomass and collection of biological stock related parameters	Ecological	Yes
[B2] Assessment of the dolphinfish stocks	Ecological	Yes
[B3] Monitoring of the dolphinfish stocks	Ecological	Yes
[B4] Identification of the impact of the fish aggregating devices (FADs) and seine nets on non-commercial species caught in the fishery	Ecological	Yes
[B5] Identification of the impact of the limestone slabs and nylon ropes used for the FADs on the benthic environment	Ecological	Yes
[B6] Research activities to identify alternative materials to construct FADs	Ecological	Yes
[B7] Possibility of introducing mitigating measures for the protection of any negative impacts resulting from B4 and B5	Ecological	Yes
[B8] Assess current socio-economic situation of fishery	Socio-economic	No
[B9] Assess likely socio-economic impacts of management measures proposed to mange fishery	Socio-economic	No
[C1] Characterization of the associated species caught together with the target purse seine catch in terms of species composition abundance and biomass and collection of biological stock related parameters	Ecological	Yes
[C2] Assessment of the small pelagic stocks`	Ecological	Yes
[C3] Monitoring of the small pelagic stocks	Ecological	Yes

[C4] Identification of the impact of the purse seine nets on non-commercial species caught in the fishery	Ecological	Yes
[C5] Possibility of introducing mitigating measures for the protection of any negative impacts resulting from C4.	Ecological	Yes
[C6] Assess current socio-economic situation of fishery	Socio-economic	No
[C7] Assess likely socio-economic impacts of management measures proposed to manage fishery	Socio-economic	No
[D1] Characterization of the associated species caught together with target seine catch in terms of species composition abundance and biomass and collection of biological stock related parameters	Ecological	Yes
[D2] Assessment of target stock *Aphia minuta*	Ecological	Yes
[D3] Monitoring of the target stock	Ecological	Yes
[D4] Identification of the impact of the seine nets on non-commercial species caught in the fishery	Ecological	Yes
[D5] Possibility of introducing mitigating measures for the protection of any negative imapctsm resulting from D4	Ecological	Yes
[D6] Assess current socio-economic situation of fishery	Socio-economic	No
[D7] Assess likely socio-economic impacts of management measures proposed to manage fishery	Socio-economic	No
[1_1] Enhancement of the conservation status of the environment and its resources through the reduction of the fishing effort	Ecological	Yes
[1_2] Reduction of the related socio-economic impact	Socio-economic	No
[1_3] Increase of the economic competitiveness	Socio-economic	No
[2_1] Reduction of fishing effort in terms of activity and capacity to allow for rebuilding of fish stocks	Ecological Socio-economic	Yes

[2_2] Recovery of competitiveness of fisheries, aquaculture and transformation of fish products, as well as enhancement of the sector organization efficiency	Socio-economic	No
[2_3] Overcome of the sector social and economical exclusion, re-organization of the sector, modernization of structures and services	Socio-economic	No
[2_4] Sustainable development of fishery-based areas	Socio-economic	Yes
[2_5] Defence of long-termed job positions, maintenance of the workers' welfare also through supplementary work	Socio-economic	No
[2_6] Ecosystem restoration through protection of the fauna and flora, development of research activities and professional training	Ecological	Yes
[2_7] Reinforcement of controls on production structures, fishing and commercialization activities	Socio-economic	No
[2_8] Strengthening and enhancement of national and regional management	Ecological Socio-economic	Yes
[3_1; 4_1; 5_1; 7_1; 8_1] Preservation of the stocks capacity of recovering from fishing	Ecological Socio-economic	Yes
[3_2; 4_2; 5_2; 7_2; 8_2; 10_2] Enhancement of the workers' welfare	Socio-economic	No
[3_3; 4_3; 5_3; 7_3; 8_3; 10_3] Increase of job opportunities in fishery-depending areas	Socio-economic	No
[6_1] Exploitation of biological resources within sustainable limits	Socio-economic	Yes
[6_2] Fisheries economic sustainability	Socio-economic	No
[6_3] Maintenance of job positions and adequate entry levels	Socio-economic	No
[10_1] Preservation of the stocks capacity of recovering from fishing and reduction of the fishing effort	Socio-economic	Yes
[15] Conservation of cetaceans	Ecological	Yes
[16] To ensure that	Ecological	Yes

Mediterranean common dolphins enjoy a favourable conservation status (i.e. stopped decline and facilitated recovery)		
[17] Protection of endangered, unique and rare habitats, as well as endangered, endemic and rare species; nursery and spawning grounds for species of economic interest; and diversity hotspots	Ecological	Yes
[18] Protection of endangered, unique and rare habitats, as well as endangered, endemic and rare species	Ecological	Yes
[59c] To ensure freedom of navigation, fishing and laying submarine cables and pipelines	Socio-economic	No
[60; 61] To control pollution of the sea by dumping	Ecological	Yes
[63_1] To achieve Environmentally Sound Management (ESM) in order to protect human health	Ecological Socio-economic	Yes
[63_1] To achieve Environmentally Sound Management (ESM) in order to protect the environment by minimizing hazardous waste production whenever possible	Ecological	Yes
[66_1] Conservation of biological diversity	Ecological	Yes
[66_2] Sustainable use of the biodiversity components	Socio-economic	Yes
[66_3] Fair and equitable sharing of the benefits arising out of the utilisation of genetic resources	Socio-economic	No
[67] Protection and preservation of the marine environment, including high seas	Ecological	Yes
[67_2] Dispute resolution regarding territorial sovereignty at sea	Socio-economic	No
[67_3] To promote international co-operation at all levels, particularly at the regional, sub-regional and bilateral levels	Ecological Socio-economic	Yes
[68_1] Prevention of the pollution of the marine environment from ships to protect crews and passengers	Socio-economic	Yes
[68_2] Prevention of the pollution of the marine	Ecological	Yes

environment from ships to protect the marine environment and coastal regions		
[69] To prevent, minimize and ultimately eliminate the transfer of harmful aquatic organisms and pathogens through the control and management of ships´ ballast water and sediments	Ecological	Yes
[70] Raise public understanding of marine ecosystems and their relevance to society	Ecological	Yes
[73] To cooperate in maintaining the populations of tuna and tuna-like fish found in the Atlantic Ocean at levels which permit the maximum sustainable catch for food and other purposes	Socio-economic	No
[74; 75; 76; 77; 78; 79; 80; 81; 82; 83] To limit and cease large-scale high seas driftnet fishing	Ecological	Yes
[76; 74; 75; 76; 77; 78; 79; 80; 81; 82; 83] To limit fisheries by-catch and discards	Ecological	Yes
[84] Conservation and management of straddling and highly migratory fish stocks in areas beyond national jurisdiction	Ecological	Yes
[85] High seas environmental conservation	Ecological	Yes
[86_1] To conserve and restore habitats of importance for endangered migratory species	Ecological	Yes
[86_2] To allow migratory species transboundary movements	Ecological	Yes
[86_3] To avoid further endangering of migratory species	Ecological	Yes
[86b_1] To prevent, abate, combat and to the fullest possible extent eliminate pollution of the Mediterranean Sea Area	Ecological	Yes
[86b_2] To protect the marine environment and the natural resources of the Mediterranean Sea Area as a part of sustainable development	Socio-economic Ecological	Yes
[87; 111b; 134d; 141b; 142b;	Ecological	Yes

142c] To avoid threatening wild fauna and flora by international trade in specimens		
[89_1] Protection of whales from overhunting	Socio-economic	Yes
[89_2] Regulation of whale fisheries	Socio-economic	No
[89_3] Development of whale stocks	Socio-economic	No
[90_1; 101_1; 141_1] To safeguard representative types of coastal and marine ecosystems of adequate size to ensure their long-term viability and to maintain their biological diversity	Ecological	Yes
[90_2; 101_2; 141_2] To safeguard habitats which are in danger of disappearing in their natural area of distribution in the Mediterranean or which have a reduced natural area of distribution as a consequence of their regression or on account of their intrinsically restricted area	Ecological	Yes
[90_3; 101_3; 141_3] To safeguard habitats critical to the survival, reproduction and recovery of endangered, threatened or endemic species of flora or fauna	Ecological	Yes
[90_4; 101_4; 141_4] To safeguard sites of particular importance because of their scientific, aesthetic, cultural or educational interest	Socio-economic	No
[91_1] To reduce threats to all cetaceans	Ecological	Yes
[91_2] To promote closer cooperation among Parties	Ecological	Yes
[91_3] To enforce legislation to prevent the deliberate taking of cetaceans in fisheries by vessels under the Parties' flag or within their jurisdiction	Ecological	Yes
[91_4] To minimise incidental catches	Ecological	Yes
[92_1] To promote the development, conservation, rational management and best utilization of living marine resources	Socio-economic	Yes
[92_2] To promote the	Socio-economic	No

sustainable development of aquaculture in the Mediterranean, Black Sea and connecting waters		
[93] To cooperate in maintaining the populations of tuna and tuna-like fish found in the Atlantic Ocean at levels which permit the maximum sustainable catch for food and other purposes	Socio-economic	No
[94; 95; 96; 119; 130; 144; 147] To reduce pollution in the Mediterranean Sea and protect and improve the marine environment in the area, thereby contributing to its sustainable development	Ecological	Yes
[96_1; 198] To prevent, reduce, combat and, as far as possible, eliminate pollution in the Zone of the Mediterranean Sea	Ecological	Yes
[96_2; 198] To attain the objective of sustainable development	Socio-economic	Yes
[96_3; 198] To protect the environment and to contribute to sustainable development	Ecological	Yes
[96_4; 198] To promote the integrated management of coastal zones, taking into account the protection of zones of ecological and landscape interest and the rational use of natural resources	Ecological Socio-economic	Yes
[96_5; 198] To apply the Convention and its Protocols	Ecological	Yes
[96_6; 198] To formulate and adopt Protocols that prescribe agreed measures, procedures and regulations to apply the Convention	Ecological	Yes
[96_7; 198] To promote, within the relevant international bodies, measures relating to the application of sustainable development programmes and environmental protection, conservation and rehabilitation and the natural resources of the Mediterranean Sea	Ecological Socio-economic	Yes
[97_1] To assess and control marine pollution to ensure	Ecological	Yes

sustainable management of natural marine and coastal resources		
[97_2] To integrate the environment in social and economic development	Ecological Socio-economic	Yes
[97_3] To protect the marine environment and coastal zones through prevention and reduction of pollution, and as far as possible, elimination of pollution, whether land or sea-based	Ecological	Yes
[97_4] To protect the natural and cultural heritage	Ecological Socio-economic	Yes
[97_5; 134] To strengthen solidarity among Mediterranean coastal States	Ecological Socio-economic	Yes
[97_6] To contribute to improvement of the quality of life	Socio-economic	Yes
[98; 142] To prevent, reduce, combat and, as far as possible, eliminate pollution from land-based sources in the Mediterranean Sea	Ecological	Yes
[99; 149; 151; 152; 168; 206; 213; 214] To prevent, reduce, combat and, as far as possible, eliminate pollution from oil exploitation	Ecological	Yes
[100] To prevent, reduce, combat and, as far as possible, eliminate pollution (from transport and dumping) in the Mediterranean Sea	Ecological	Yes
[101_1] To safeguard representative types of coastal and marine ecosystems of adequate size to ensure their long-term viability and to maintain their biological diversity	Ecological	Yes
[101_2] To safeguard habitats which are in danger of disappearing in their natural area of distribution in the Mediterranean or which have a reduced natural area of distribution as a consequence of their regression or on account of their intrinsically restricted area	Ecological	Yes
[101_3] To safeguard habitats	Ecological	Yes

critical to the survival, reproduction and recovery of endangered, threatened or endemic species of flora or fauna		
[101_4] To safeguard sites of particular importance because of their scientific, aesthetic, cultural or educational interest	Socio-economic	No
[102_1; 123] To facilitate, through the rational planning of activities, the sustainable development of coastal zones by ensuring that the environment and landscapes are taken into account in harmony with economic, social and cultural development	Socio-economic Ecological	Yes
[102_2; 123] To preserve coastal zones for the benefit of current and future generations	Ecological Socio-economic	Yes
[102_3; 123] To ensure the sustainable use of natural resources, particularly with regard to water use	Socio-economic	Yes
[102_4; 123] To ensure preservation of the integrity of coastal ecosystems, landscapes and geomorphology	Ecological	Yes
[102_5; 123] To prevent and reduce the effects of natural hazards and in particular of climate change, which can be induced by natural or human activities	Socio-economic Ecological	Yes
[102_6; 123] To achieve coherence between public and private initiatives and between all decisions by the public authorities, at the national, regional and local levels, which affect the use of the coastal zone	Managerial	Yes
[103a] Protection of biodiversity and halt of biodiversity loss within the EU by 2020	Ecological	Yes
[103b] To eliminate activities that directly threaten birds, such as the deliberate killing or capture of birds, the destruction of their nests and taking of their eggs, and associated activities such as trading in live or dead birds, with a few exceptions	Ecological	Yes

[103b] To manage (legitimate) hunting of some species, provided that this practice is sustainable	Ecological	No
[103b] To outlaw all forms of non-selective and large scale killing of birds	Ecological	Yes
[103b] To promotes research to underpin the protection, management and use of all species of birds covered by the Directive	Ecological	Yes
[104_1] To assess and control marine pollution to ensure sustainable management of natural marine and coastal resources	Socio-economic Ecological	Yes
[104_2] To integrate the environment in social and economic development	Socio-economic Ecological	Yes
[104_3] To protect the marine environment and coastal zones through prevention and reduction of pollution, and as far as possible, elimination of pollution, whether land or sea-based	Ecological	Yes
[104_4] To protect the natural and cultural heritage	Ecological Socio-economic	Yes
[104_5] To strengthen solidarity among Mediterranean coastal States	Managerial	Yes
[104_6] To contribute to improvement of the quality of life	Socio-economic	Yes
[105] To prevent, deter and eliminate illegal, unreported and unregulated fishing	Socio-economic Ecological	Yes
[106_1] To establishing a Community framework for the collection, management and use of data in the fisheries sector	Socio-economic	Yes
[106_2] To support for scientific advice regarding the Common Fisheries Policy	Socio-economic	Yes
[107] Protection of biodiversity and halt of biodiversity loss within the EU (actually by 2020)	Ecological	Yes
[108_1] Collection, management and use of data in the fisheries sector	Socio-economic	Yes
[108_2] To support scientific advice regarding the Common	Socio-economic	Yes

Fisheries Policy		
[109_1] To protect and preserve the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they have been adversely affected	Ecological	Yes
[109_2] To prevent and reduce inputs in the marine environment, with a view to phasing out pollution, so as to ensure that there are no significant impacts on or risks to marine biodiversity, marine ecosystems, human health or legitimate uses of the sea	Ecological	Yes
[109b_1] To prevent, abate, combat and to the fullest possible extent eliminate pollution of the Mediterranean Sea Area	Ecological	Yes
[109b_2] To protect the marine environment and the natural resources of the Mediterranean Sea Area as a part of sustainable development	Socio-economic Ecological	Yes
[110] To regulate the use of alien and locally absent species in aquaculture	Ecological Socio-economic	Yes
[111; 112] To implement the European Fisheries Fund	Socio-economic	No
[111c_1] Protection of areas of aggregation of juveniles, including the high seas	Ecological	Yes
[111c_2] Prohibition or strict regulation of harmful fishing gear, including the high seas	Ecological	Yes
[111c_3] Reduction of the amount of discards, including the high seas	Ecological	Yes
[111c_4] Management of fishing effort as the key to deliver sustainable fisheries, including the high seas	Socio-economic	Yes
[111c_5] Protection of nursery and sensitive habitats, including the high seas	Ecological Socio-economic	Yes
[111c_6] To enhance the social sustainability of Mediterranean fisheries, including the high seas	Socio-economic	No
[111c_7] To ensure that leisure fishing does not interfere with	Socio-economic	Yes

commercial fishing and sustainable exploitation of fisheries, including the high seas		
[111c_8] To establishes fishing protected areas within and beyond territorial seas, including the high seas	Ecological Socio-economic	Yes
[112b] To strengthen economic and social cohesion in order to promote the harmonious, balanced and sustainable development of the European Union (EU) regions for the period 2007-2013	Socio-economic	No
[113] To implement financial measures to promote the Common Fisheries Policy	Socio-economic	No
[114] To establish a list of Specially Protected Areas in the Mediterranean biogeographic region	Ecological	Yes
[115a; 120; 124; 137] To implement control, inspection and surveillance systems for the common fisheries policy	Socio-economic	No
[115b] Legal enforcement of environmental protection	Ecological	Yes
[115d] To ensure a high level of safety and environmental protection in relation to maritime transport	Ecological	Yes
[116] To fix the maximum annual fishing effort for certain fishing areas and fisheries	Socio-economic	No
[116b] To adopt GFCM recommendations as binding principles	Socio-economic	NJo
[117] To establish monitoring of pelagic trawl and tracking of incidental catches of cetaceans	Ecological Socio-economic	Yes
[118, 133] To establish an advisor system for the Common Fisheries Policy	Socio-economic	No
[121] To prevent and remedy environmental damage, including damage to protected species and natural habitats	Ecological	Yes
[122_1] Conservation of fisheries	Socio-economic	No
[122_2] Sustainable exploitation of fisheries resources	Socio-economic	Yes
[122_3] Environmental protection	Ecological	Yes

[122_4] Access restriction in the case of waters within 12 nm of coastal Member States' baselines	Socio-economic	No
[122b_1] To ensure human safety on board	Socio-economic	No
[122b_2] To prevent marine pollution from ships	Ecological	Yes
[125_1; 140_1; 149_1] To provide a high level of protection of the environment	Ecological	Yes
[125_2; 140_2; 149_2] To reduce the environmental impact of projects, plans and programmes	Ecological	Yes
[125b_1] Protection of the marine environment, coastlines and human health against the risks of accidental or deliberate pollution at sea, excluding continuous streams of pollution originating from land-based sources	Ecological	Yes
[125b_2] To improve response in case of incidents involving spills or imminent threats of spills of oil or other harmful substances at sea and also to contribute to the prevention of the risks	Ecological	Yes
[125b_3] To strengthen the mutual assistance and cooperation between Member States in this field	Managerial	Yes
[125b_4] To promote cooperation between Member States in order to provide for compensation for damage in accordance with the polluter-pays principle	Socio-economic	No
[125c] To contribute to the implementation, updating and development of Community environment policy and of environmental legislation, in particular as regards the integration of the environment into other policies, and to sustainable development in the Community through funding of nature conservation projects	Ecological	Yes
[126] Collection and management of the data needed to conduct the common fisheries policy	Socio-economic	No

[127] Enhance communication with the fishing sector and groups affected by the common fisheries policy	Socio-economic	No
[128] To establish a common organisation of the markets in fishery and aquaculture products	Socio-economic	No
[129_1] To prevent and reduce pollution in order to achieve "good ecological and chemical status" for all Community waters by 2015	Ecological	Yes
[129_2] To promote sustainable water usage in order to achieve "good ecological and chemical status" for all Community waters by 2015	Ecological	Yes
[129_3] To protect environment in order to achieve "good ecological and chemical status" for all Community waters by 2015	Ecological	Yes
[129_4] To improve aquatic ecosystems in order to achieve "good ecological and chemical status" for all Community waters by 2015	Ecological	Yes
[129_5] To mitigate the effects of floods and droughts in order to achieve "good ecological and chemical status" for all Community waters by 2015	Ecological	Yes
[229b] To provide subsides for temporal stop (more than 30 days) of fishing units during 1998 only (*una tantum*)	Socio-economic	No
[131] To reduce pollution from land-based sources in the Mediterranean Sea and protect and improve the marine environment in the area, thereby contributing to its sustainable development	Ecological	Yes
[132b_1] To protect, preserve and manage in a sustainable and environmentally sound way areas of particular natural or cultural value, notably by the establishment of specially protected areas (SPAs)	Ecological	Yes
[132b_2] To protect, preserve and manage threatened or endangered species of flora and	Ecological	Yes

fauna		
[132b_2.1] To safeguard representative types of coastal and marine ecosystems of adequate size to ensure their long-term viability and to maintain their biological diversity	Ecological	Yes
[132b_2.2] To safeguard habitats which are in danger of disappearing in their natural area of distribution in the Mediterranean or which have a reduced natural area of distribution as a consequence of their regression or on account of their intrinsically restricted area	Ecological	Yes
[132b_2.3] To safeguard habitats critical to the survival, reproduction and recovery of endangered, threatened or endemic species of flora or fauna	Ecological	Yes
[132b_2.4] To safeguard sites of particular importance because of their scientific, aesthetic, cultural or educational interest	Socio-economic	No
[134] To promote cooperation between the signatory States in order to conserve wild flora and fauna and their natural habitats and to protect endangered migratory species	Ecological	Yes
[134b] To adopt GFCM recommendations as binding principles	Socio-economic	No
[134c] Conservation and management of the living resources of the high seas	Ecological	Yes
[134e] To the assessment of the environmental effects of those public and private projects which are likely to have significant effects on the environment	Ecological	Yes
[134f] To promote compliance with international conservation and management measures by fishing vessels on the high seas	Ecological	Yes
[135] To regulate special fishing permits	Socio-economic	No
[136] Conservation of fishery resources in the Mediterranean	Socio-economic	Yes

[137c_1] Conservation of biological diversity	Ecological	Yes
[137c_2] Sustainable use of its [diversity] components	Socio-economic	Yes
[137c_3] Fair and equitable sharing of the benefits arising out of the utilization of genetic resources	Socio-economic	No
[137f] To establish a framework for the conservation and protection of fishing resources	Ecological	Yes
[137d] To contribute to the implementation, development and enhancement of Community environmental policy and legislation	Ecological	Yes
[137e] To regulate the use and the length of driftnets (limited to 2.5 km)	Ecological	Yes
[138_1; 169; 176; 153; 154; 155; 160; 161; 169; 171; 173; 176; 184; 185; 190; 191; 193; 217; 219; 220; 223; 226] Conservation of habitats listed in Annex I of the EC Habitats Directive	Ecological	Yes
[138_2; 169; 176; 153; 154; 155; 160; 161; 169; 171; 173; 176; 184; 185; 190; 191; 193; 217; 219; 220; 223; 226] Conservation of wild fauna and flora species listed in Annex II of the EC Habitats Directive	Ecological	Yes
[138_3; 169; 176; 153; 154; 155; 160; 161; 169; 171; 173; 176; 184; 185; 190; 191; 193; 217; 219; 220; 223; 226] Conservation of any marine special protection areas established under the EC Birds Directive	Ecological	Yes
[138b_1] Preserving, protecting and improving the quality of the environment	Ecological	Yes
[138b_2] Protecting human health	Socio-economic	No
[138b_3] Prudent and rational utilisation of natural resources	Ecological Socio-economic	Yes
[138b_4] Promoting measures at international level to deal with regional or worldwide environmental problems	Ecological Managerial	Yes
[138c_1] To help make the environmental dimension a more integral part of Community	Ecological	Yes

policies		
[138c_2] To increase the effectiveness of Community environment policy and measures in the region	Ecological	Yes
[138c_3] To integrate cooperation and coordination at regional, national, Community and international level	Ecological Socio-economic	Yes
[138c_4] To encourage the transfer of appropriate technologies	Socio-economic	No
[138c_5] To help make the environmental dimension a more integral part of Community policies	Ecological	Yes
[139] To support economically the Common Fishery Policy for the conservation and management of fishery resources	Socio-economic	Yes
[140b_1] Protection of human health	Socio-economic	No
[140b_2] Protection of the environment	Ecological	Yes
[143] To ensure the conservation of European wildlife and natural habitats by means of cooperation between States	Ecological	Yes
[143_1] Conservation of wild flora and fauna, and their natural habitats	Ecological	Yes
[143_2] To plan and develop policies, and measures against pollution	Ecological	Yes
[143_3] Education and dissemination of general information on the need to conserve species of wild flora and fauna and their habitats	Ecological	Yes
[143_4] Co-ordination of research related to the purposes of the Convention	Ecological	Yes
[143_5] To enhance the effectiveness of these measures through international co-operation	Ecological Managerial	Yes
[143b] Reduction of pollution caused by hydrocarbons discharged at sea	Ecological	Yes
[144b] Protection of cetaceans	Ecological	Yes
[145_1] Protection of stocks	Socio-economic	Yes

against over-fishing		
[145_2] Guaranteed incomes for fishermen	Socio-economic	No
[145_3] Regular supply at reasonable prices for consumers and the processing industry	Socio-economic	No
[145_4] Sustainable biological, environmental and economic exploitation of living aquatic resources	Socio-economic	No
[146_1; 160; 162; 163; 164; 170; 171; 173; 176; 184; 190; 202; 204; 217; 219; 220; 223; 226] Conservation of bird species	Ecological	Yes
[146_2; 160; 162; 163; 164; 170; 171; 173; 176; 184; 190; 202; 204; 217; 219; 220; 223; 226] Conservation of natural habitats	Ecological	Yes
[146_3; 160; 162; 163; 164; 170; 171; 173; 176; 184; 190; 202; 204; 217; 219; 220; 223; 226] Restoration of birds' biotopes	Ecological	Yes
[146_4; 160; 162; 163; 164; 170; 171; 173; 176; 184; 190; 202; 204; 217; 219; 220; 223; 226] Generation of birds' biotopes	Ecological	Yes
[147b] To regulate potential aquatic pollution chemicals produced in Europe, including coastal waters	Ecological	Yes
[147c_1] To reduce the pollution of bathing water	Ecological	Yes
[147c_2] To protect such water against further deterioration	Ecological	Yes
[148] Monitoring the entity of leisure fishing	Socio-economic	No
[149_1] Overarching goal: environmental conservation	Ecological	Yes
[149_2; 168] Sustainable development	Socio-economic	No
[150_1; 156; 158; 159; 167; 172; 174; 175; 178; 188; 194; 196; 197; 199; 203; 205; 208; 210; 221; 222; 225; 227; 228; 231; 232; 239 – but see 165; 168] Conservation of natural and cultural heritage	Ecological Socio-economic	Yes
[150_2; 156; 158; 159; 167; 172; 174; 175; 178; 188; 194; 196; 197; 199; 203; 205; 208; 210; 221; 222; 225; 227; 228; 231; 232; 239 – but see 165; 168]	Ecological	Yes

Habitats protection		
[150_3; 156; 158; 159; 167; 172; 174; 175; 178; 188; 194; 196; 197; 199; 203; 205; 208; 210; 221; 222; 225; 227; 228; 231; 232; 239 – but see 165; 168] Species protection; environmental education and research	Ecological	Yes
[150_4; 156; 158; 159; 167; 172; 174; 175; 178; 188; 194; 196; 197; 199; 203; 205; 208; 210; 221; 222; 225; 227; 228; 231; 232; 239 – but see 165; 168] Environmental education and research	Ecological	Yes
[166_1] Environmental conservation in the international high seas	Ecological	Yes
[166_2] Sustainable fisheries in the international high seas	Socio-economic	Yes
[157; 179_1; 180] To promote the use of renewable energies within MPAs	Ecological	Yes
[177] To allow for changes in the organization of the management bodies of MPAs and institution of a dedicated environmental branch within the Coast Guard	Ecological	No
[179_2; 180] To promote energy efficiency within MPAs	Ecological	Yes
[179_3; 180] To promote sustainable mobility within MPAs	Ecological	Yes
[186_1] Institution of a technical department for the establishment and update of MPAs within the Ministry of the Environment	Ecological	No
[181_1] To establish management units that are homogeneous from ecological, social and economical points of view	Ecological	No
[181_2] To promote sustainable ways of fisheries exploitation	Socio-economic	Yes
[181_3] To increase job opportunities	Socio-economic	No
[181_4] To conclude the Regulations CEE 4028/86 and CEE n. 2080/93 on the decrease of fishing capacity within 30 Jun 2002	Socio-economic	Yes

[181_5] To facilitate access to credit of the fisheries sector	Socio-economic	No
[182_1] Establishment of a standard for environmental surveys	Ecological	Yes
[182_2] To ensure the development of regional agencies for the environment	Ecological	No
[182_3] To update the equipments of environmental laboratories	Ecological	No
[182_4] To coordinate the environmental information system with the geological information system to produce hydrological risk maps	Socio-economic	No
[183_1] To promote the social and economic development of fisheries ensuring the protection of nature, biodiversity and cultural heritage	Socio-economic	Yes
[183_2] To develop marine resources including management and protection of the environment, including new economic incomes	Socio-economic Ecological	Yes
[183_3] To update fishing structures and techniques with low environmental impact, keeping pace with market demand and the protection of the consumer and the environment	Socio-economic Ecological	Yes
[183_4] To enhance environmental protection	Ecological	Yes
[183_5] To promote job occupation in the fisheries sector	Socio-economic	No
[185c] To regulate and limit the use of a particular type of gear for the squid *Todarodes sagittatus*	Socio-economic	No
[185d] To regulate and limit the use of a particular type of drifting net for small pelagic fishes	Socio-economic Ecological	No
[188c] To subsidize the artisanal fishing fleet (within 12 nm from the coastline)	Socio-economic	No
[185e; 188b] To regulate touristic fishing	Socio-economic	No
[185b] To simplify administrative issues regarding fisheries	Managerial	No

[186_2] Institution of a national program on *Posidonia oceanica* of 3 years	Ecological	Yes
[186_3] To endorse the management of MPAs to public entities, research institutions and environmental associations	Managerial	No
[187] To charge the local (Sicilian) government with competences to produce management plans regarding nature conservation, environmental protection, water quality and preservation of the natural heritage	Ecological Managerial	Yes
[189] To subsidize the fisheries sector during the 1998-2000 period	Socio-economic	No
[189b] To achieve a temporal reduction of fishing effort in trawlers and purse-seiners during 1998	Socio-economic	No
[191b] Establishes a process to authorize or deny the existing fishing gears and places the Ministry to establish a framework of regulations within 31 Jan 1998	Socio-economic	No
[192] To move administrative powers in fisheries from the central government to local ones (Sicily)	Socio-economic	No
[193b] To authorize, regulate and limit the fisheries of fish-fry and transparent goby (*Aphia minuta*)	Socio-economic	No
[195_1] To limit fishing effort	Socio-economic	Yes
[195_2] To regulate authorized fishing gears	Socio-economic	No
[195_3] To diversify fishing effort	Socio-economic	No
[195_4] To promote the passage from trawling to other fishing methods	Socio-economic	Yes
[195_5] To apply Regs. CEE 2930/86 and CEE 2104/93	Socio-economic	No
[206b_1] Establishment of the division of the fishing areas in homogeneous management subareas (districts)	Socio-economic	No
[206b_2] Promotion of educational courses for fishermen on new technologies,	Socio-economic	No

aquaculture and environmental issues		
[206b_3] To define and prohibit a number of fishing behaviours	Socio-economic	Yes
[212_1; 201; 200; 200b] Establishment of a national fisheries plan	Socio-economic	No
[212_2; 201; 200; 200b] Rational management of maritime biological resources	Socio-economic	Yes
[212_3; 201; 200; 200b] Increase of biological productivity and value of massively fished species	Socio-economic	No
[212_4; 201; 200; 200b] Diversification of the demand, rationalization of the market and increase of consumes	Socio-economic	No
[212_5; 201; 200; 200b] Increase of the value of fishing products	Socio-economic	No
[212_6; 201; 200; 200b] Enhancement of the fishermen's welfare and working conditions; enhancement of the commercial balance of the sector	Socio-economic	No
[212_7; 201; 200; 200b] Enhancement of the commercial balance of the fisheries sector	Socio-economic	No
[216; 215; 209; 207; 200; 200b] To regulate maritime fishing	Socio-economic	No
[218] Promotion of economic activities within SACs and SPAs	Socio-economic	No
[224] To carry into effect the Reg. CE 1260/1998, implementing the management of funds through the national operative program (PON) 2000-2006	Socio-economic Managerial	No
[229_1] To provide subsides for disasters not covered by insurances in the fisheries sector	Socio-economic	No
[229_2] To provide subsides in the fisheries sector for unemployment	Socio-economic	No
[229_3] To provide subsides in the fisheries sector for "consorzi"	Socio-economic	No
[229_4] To provide subsides in the fisheries sector for families of shipwrecked person	Socio-economic	No
[229_5] To provide subsides in the fisheries sector for one single fishing vessel identified as "Orchidea"	Socio-economic	No

[230b_1] To enlarge the beneficiaries of some subsidies	Socio-economic	No
[230b_2] To exclude the duty of demolition of some fishing vessels	Socio-economic	No
[234] To provide funds for enforcement and monitoring of the fisheries sector	Socio-economic	No
[235_1; 236_1] Rational management of the biological resources. *In practice, it encourages the passage from small trawling vessels to large trawling vessels as well as other types of fishing and aquaculture activities*	Socio-economic	No
[235_2; 236_2] Decrease of fishing effort. *In practice, it encourages the passage from small trawling vessels to large trawling vessels as well as other types of fishing and aquaculture activities*	Socio-economic	No
[235_3; 236_3] Increase of biological production and its economical value. *In practice, it encourages the passage from small trawling vessels to large trawling vessels as well as other types of fishing and aquaculture activities*	Socio-economic	No
[235_4; 236_4] Diversification and enhancement of the fish market. *In practice, it encourages the passage from small trawling vessels to large trawling vessels as well as other types of fishing and aquaculture activities*	Socio-economic	No
[235_5; 236_5] Enhancement of fishermen conditions. *In practice, it encourages the passage from small trawling vessels to large trawling vessels as well as other types of fishing and aquaculture activities*	Socio-economic	No
[235_6; 236_6] Increase of job opportunities in fisheries and aquaculture. *In practice, it encourages the passage from small trawling vessels to large trawling vessels as well as other types of fishing*	Socio-economic	No

and aquaculture activities		
[240] General legal framework for the fisheries sector	Socio-economic	No

Usually an SMA will have a range of ecological and socio-economic objectives. It is important for evaluation that these are well balanced. How well the ecological and socio-economic objectives are or can be balanced will be evaluated through the WP6 governance research, drawing on the institutional settings and the views and perspectives from stakeholders of the SMA.

Action 1b.4: Assessment of operational objectives

Operational objectives should be SMART (Specific, Measurable, Achievable, Realistic and Time-bound). Table 1b.4.1 shows the definitions of these.

Table 1b.4.1

Specific	The operational objective needs to be specific. Specific means that it is clearly defined and it is possible to quantify
Measurable	The operational objective needs to be measurable. Clearly defined targets which can be quantified
Achievable	The operational objective needs to be achievable. It should be possible to achieve the defined targets.
Realistic	The operational objective needs to be realistic. It should be possible to achieve the defined targets in the given time frame.
Time-bound	The operational objective needs to time-bound. A timeline can be associated to the defined targets.

Filling out Table 1b.4.2 will show which objectives are not SMART.

In the absence of an integrated management plan, more operational objectives are derived for Sicily by combining the following:

[Der1] Reduction of fishing mortality by (roughly) 20% within 2013: 1_1, 1_2, 2_1, 10_1, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 92_2, 106_2, 108_2, 110, 111c_4, 116, 116b, 118, 145_1, 181_4, 189b, 195_1, 200, 200b, 201, 212_1, 235_2, 236_2

[Der2] Enhancement of (mainly fishermen) welfare by 2013: 1_2, 1_3, 2_2, 2_3, 2_4, 2_5, 2_8, 3_2, 4_2; 5_2, 7_2, 8_2, 10_2, 3_3, 4_3, 5_3, 7_3, 8_3, 10_3, 6_3, 63_1, 97_4, 97_5, 134, 97_6, 104_4, 104_5, 104_6, 106_2, 108_2, 111, 111c_7, 112, 112b, 113, 118, 122b_1, 127, 133, 138b_2, 138c_4, 140b_1, 145_2, 145_3, 147c_1, 147c_2, 181_3, 181_5, 182_1, 183_2, 183_3, 183_5, 188c, 189, 200, 200b, 201, 212_5, 212_7, 224, 229_1, 229_2, 229b, 230b_1, 235_5, 235_6, 236_5, 236_6

[Der3] Nature conservation, environmental protection, ecosystem restoration, and halt of biodiversity loss by 2020: 2_6, 15, 16, 17, 18, 60, 61, 63_1, 63_2, 66_1, 67, 68_1, 68_2, 69, 70, 84, 85, 86_1, 86_2, 86_3, 86b_1, 86b_2, 87, 89_1, 90_1, 90_2, 90_3, 90_4, 91_1, 91_2, 91_3, 91_4, 94, 95, 96, 96_1, 96_3, 96_4, 96_5, 96_6, 96_7, 97_1, 97_2, 97_3, 97_4, 97_5, 98, 99, 100, 101_1, 101_2, 101_3, 101_4, 102_1,

102_2, 102_4, 102_5, 102_6, 103a, 103b, 104_1, 104_2, 104_3, 104_4, 105_5, 107, 109_1, 109_2, 109b_1, 109b_2, 111b, 111c_1, 111c_2, 111c_3, 111c_5, 111c_8, 114, 115b, 115d, 117, 119, 121, 122_3, 122b_2, 123, 125_1, 125_2, 125b_1, 125b_2, 125b_3, 125b_4, 125c, 129_1, 129_2, 129_3, 129_4, 129_5, 130, 131, 132b_1, 132b_2, 132b_2.1, 132b_2.2, 132b_2.3, 132b_2.4, 134, 134c, 134d, 134e, 134f, 137c_1, 137d, 137e, 138_1, 138_2, 138_3, 138b_1, 138b_4, 138c_1, 138c_2, 138c_3, 138c_5, 140_1, 140_2, 140b_2, 141_1, 141_2, 141_3, 141_4, 141b, 142, 142b, 142c, 143, 143_1, 143_2, 143_3, 143_4, 143_5, 143b, 144, 144b, 146_1, 146_3, 146_4, 147, 147b, 147c_1, 147c_2, 149, 149_1, 149_2, 150_1, 150_2, 150_3, 150_4, 151, 152, 153, 154, 155, 156, 158, 159, 160, 161, 162, 163, 164, 166_1, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 182_1, 182_2, 183_1, 183_2, 183_3, 183_4, 184, 185, 186_1, 186_2, 186_3, 187, 188, 190, 191, 193, 194, 196, 197, 198, 199, 202, 203, 204, 205, 206, 208, 210, 213, 214, 217, 219, 220, 221, 222, 223, 225, 226, 227, 228, 231, 232, 239

[Der4] Sustainable exploitation of natural resources: 2_7, 3_1, 4_1, 5_1, 7_1, 8_1, 6_1, 6_2, 10_1, 66_2, 70, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 89_1, 89_2, 89_3, 91_4, 92_1, 93, 96_2, 96_3, 96_4, 96_7, 97_1, 102_1, 102_3, 102_5, 102_6, 103b, 104_1, 105, 106_1, 106_2, 108_1, 108_2, 109_2, 109b_2, 111c_2, 111c_4, 111c_5, 111c_6, 111c_7, 111c_8, 115a, 116, 116b, 117, 118, 120, 122_1, 122_2, 122_4, 123, 124, 126, 127, 133, 134b, 134c, 134f, 135, 136, 137, 137f, 137e, 138b_3, 138c_4, 139, 145_1, 145_4, 148, 149_2, 157, 166_2, 168, 179_1, 179_2, 179_3, 180, 181_2, 182_4, 183_2, 185c, 185d, 185e, 188b, 191b, 193b, 195_2, 195_3, 195_4, 195_5, 198, 200, 200b, 201, 207, 209, 212_1, 212_2, 215, 216, 218, 229_3, 234, 235_1, 236_1

[Der5] Preservation of cultural heritage: 101_4, 150_1, 183_1, 188c
[D6] Other: 66_3, 137c_3, 128, 177, 181_1, 182_4, 185b, 192, 206b_1, 206b_2, 206b_3, 212_4, 212_5, 229_3, 229_4, 229_5, 230b_2, 235_3, 235_4, 236_3, 236_4, 240

Table 1b.4.2s

Operational objective	Specific (yes or no)	Measurable (yes or no)	Achievable (yes or no)	Realistic (yes or no)	Time-bound (yes or no)	Comments on quality of data available
[Der1] Reduction of fishing mortality by (roughly) 20% within 2013	yes	yes	yes	no	yes	Low precision (estimated error 25%); low accuracy (potentially flawed)
[Der2] Enhancement of welfare by 2013	yes	yes	no	no	yes	
[Der3] Nature conservation, environmental protection, ecosystem restoration, and halt of biodiversity loss by 2020	yes	yes	no	no	yes	Lack of quantitative data except for coverage of *P. oceanica*, yet not available in practice. Unrealistic "to halt…" in the present

						context
[Der4] Sustainable exploitation of natural resources	no	yes	yes	yes	no	
[Der5] Preservation of cultural heritage	no	no	yes	yes	no	
[Der6] Other	na	na	na	na	na	
[A1] Assessment of the stocks for the most important commercial species	yes	yes	yes	yes	yes	Good
[A2] Identification of 'essential fish habitats' for the most important stocks	yes	yes	yes	yes	Yes	Good
[A3] Identification of current trawling grounds both spatially and temporally	yes	yes	yes	yes	Yes	Good
[A4] Using fishing effort as an indicator of trawling pressure	yes	yes	yes	yes	yes	Good
[A5] Identifying the impacts of trawling on the fishing grounds, including the commercial species, non-commercial species and habitats and its relationship to trawling pressure	yes	yes	yes	yes	yes	Intermediate ?
[A6] Possibility of the relocation of fishing effort and the current authorized trawling grounds	Yes	yes	yes	yes	Yes	Good
[A7] The supply of continuous information of the state of demersal resources	Yes	yes	yes	Yes	Yes	good
[A8] Identification and characterization of the biogenesis in territorial waters	yes	yes	yes	yes	yes	Poor/intermediate
[A9] Cdentification and characterization of habitats listed in the habitats directive	Yes	yes	yes	yes	yes	Intermediate data

especially in trawling grounds						
[A10] Characterization of the discards from the trawl fishery in terms of species composition, biomass and density indices	Yes	yes	yes	yes	yes	Good data
[A11] Identification of incidental captures of any protected species especially in trawling grounds	yes	yes	yes	Yes	yes	Good data
[A12] Identification of critical habitats for species of bird fauna						
[A13] Possibility of introducing mitigating measures for the protection of habitats protected species and reduction of discards	yes	yes	yes	yes	Yes	Good data (
[A14] Development of a monitoring program to monitor the evaluation of the protection measures	yes	yes	yes	Yes	yes	Poor data
[A15] Assess current socio-economic situation of fishery	Yes	yes	yes	Yes	yes	Poor data
[A16] Assess likely socio-economic impacts of management measures proposed to manage fishery	yes	yes	yes	yes	yes	Poor data
[B1] Characterization of the associated species caught together with the dolphinfish in terms of species composition abundance and biomass and collection of biological stock related parameters	yes	yes	yes	yes	yes	Good data
[B2] Assessment of the dolphinfish stocks	yes	Yes	yes	yes	yes	Intermediate data
[B3] Monitoring of the dolphinfish stocks	yes	yes	yes	yes	yes	Intermediate data

[B4] Identification of the impact of the fish aggregating devices (FADs) and seine nets on non-commercial species caught in the fishery	yes	yes	yes	yes	yes	Intermediate data
[B5] Identification of the impact of the limestone slabs and nylon ropes used for the FADs on the benthic environment	yes	yes	yes	yes	yes	Poor data
[B6] Research activities to identify alternative materials to construct FADs	yes	yes	yes	yes	yes	Intermediate data
[B7] Possibilty of introducing mitigating measures for the protection of any negative impacts resulting from B4 and B5	yes	yes	yes	yes	yes	Intermediate data
[B8] Assess current socio-economic situation of fishery	yes	yes	yes	yes	yes	Good data
[B9] Assess likely socio-economic impacts of management measures proposed to manage fishery	yes	yes	yes	yes	yes	Poor data (For now)
[C1] Characterization of the associated species caught together with the target purse seine catch in terms of species composition abundance and biomass and collection of biological stock related parameters	yes	yes	yes	yes	yes	Intermediate data
[C2] Assessment of the small pelagic stocks`	yes	yes	yes	yes	yes	Poor data (For now)
[C3] Monitoring of the small pelagic stocks	yes	yes	yes	yes	yes	Good data
[C4] Identification of	yes	yes	yes	yes	yes	Intermediate

the impact of the purse seine nets on non-commercial species caught in the fishery						data
[C5] Possibility of introducing mitigating measures for the protection of any negative impacts resulting from C4.	yes	yes	yes	yes	yes	Intermediate data
[C6] Assess current socio-economic situation of fishery	yes	yes	yes	yes	yes	Poor data (For now)
[C7] Assess likely socio-economic impacts of management measures proposed to manage fishery	yes	yes	yes	yes	yes	Poor data (For now)
[D1] Characterization of the associated species caught together with target seine catch in terms of species composition abundance and biomass and collection of biological stock related parameters	yes	yes	yes	yes	yes	Intermediate data
[D2] Assessment of target stock *Aphia minuta*	yes	yes	yes	yes	yes	Intermediate data
[D3] Monitoring of the target stock	yes	yes	yes	yes	yes	Intermediate data
[D4] Identification of the impact of the seine nets on non-commercial species caught in the fishery	yes	yes	yes	yes	yes	Intermediate data
[D5] Possibility of introducing mitigating measures for the protection of any negative imapctsm resulting from D4	yes	yes	yes	yes	yes	Intermediate data
[D6] Assess current socio-economic situation of fishery	yes	yes	yes	yes	yes	Intermediate data
[D7] Assess likely socio-economic impacts of	yes	yes	yes	yes	yes	Poor data

management measures
proposed to manage
fishery

Where an objective has been found not to be SMART then, where possible, action should be taken in order to make it SMART i.e. make it operational. Fill out table 1b.4.3 with the new list of fully SMART operational objectives.

Table 1b.4.3

Operational Objectives
[Der1] Substantial reduction (say 20%) and rational spatial allocation of fishing effort by 2013
[Der2] Financial viability and safe working conditions for fishermen by 2013
[Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020
[Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date
[Der5] Preservation of specific issues regarding the cultural heritage (say artisanal fisheries) within a given date
[A1] Assessment of the stocks for the most important commercial species
[A2] Identification of 'essential fish habitats' for the most important stocks
[A3] Identification of current trawling grounds both spatially and temporally
[A4] Using fishing effort as an indicator of trawling pressure
[A5] Identifying the impacts of trawling on the fishing grounds, including the commercial species, non-commercial species and habitats and its relationship to trawling pressure
[A6] Possibility of the relocation of fishing effort and the current authorized trawling grounds
[A7] The supply of continuous information of the state of demersal resources
[A8] Identification and characterization of the biogenesis in territorial waters
[A9] Identification and characterization of habitats listed in the habitats directive especially in trawling grounds
[A10] Characterization of the discards from the trawl fishery in terms of species composition, biomass and density indices
[A11] Identification of incidental captures of any protected species especially in trawling grounds
[A12] Identification of critical habitats for species of bird fauna
[A13] Possibility of introducing mitigating measures for the protection of habitats protected species and reduction of discards
[A14] Development of a monitoring program to monitor the evaluation of the protection measures
[A15] Assess current socio-economic situation of fishery
[A16] Assess likely socio-economic impacts of management measures proposed to manage fishery
[B1] Characterization of the associated species caught together with the dolphinfish in terms of species composition abundance and biomass and collection of biological stock related parameters
[B2] Assessment of the dolphinfish stocks
[B3] Monitoring of the dolphinfish stocks
[B4] Identification of the impact of the fish aggregating devices (FADs) and seine nets on non-commercial species caught in the fishery
[B5] Identification of the impact of the limestone slabs and nylon ropes used for the FADs on the benthic environment
[B6] Research activities to identify alternative materials to construct FADs
[B7] Possibilty of introducing mitigating measures for the protection of any negative impacts resulting from B4 and B5
[B8] Assess current socio-economic situation of fishery
[B9] Assess likely socio-economic impacts of management measures proposed to manage fishery

[C1] Characterization of the associated species caught together with the target purse seine catch in terms of species composition abundance and biomass and collection of biological stock related parameters
[C2] Assessment of the small pelagic stocks`
[C3] Monitoring of the small pelagic stocks
[C4] Identification of the impact of the purse seine nets on non-commercial species caught in the fishery
[C5] Possibility of introducing mitigating measures for the protection of any negative impacts resulting from C4.
[C6] Assess current socio-economic situation of fishery
[C7] Assess likely socio-economic impacts of management measures proposed to manage fishery
[D1] Characterization of the associated species caught together with target seine catch in terms of species composition abundance and biomass and collection of biological stock related parameters
[D2] Assessment of target stock *Aphia minuta*
[D3] Monitoring of the target stock
[D4] Identification of the impact of the seine nets on non-commercial species caught in the fishery
[D5] Possibility of introducing mitigating measures for the protection of any negative imapctsm resulting from D4
[D6] Assess current socio-economic situation of fishery
[D7] Assess likely socio-economic impacts of management measures proposed to manage fishery

Action 1b.5: Assessment of policy approaches

Policy approaches can be top-down (imposed by government), bottom-up (meeting popular demands from end users), or a combination of both. The balance between these policy approaches will give an indication of how likely end-users will be to follow enforcement laws in the SMA. This assessment will be carried out through the governance analysis.

Action 1b.6: Concluding on goals and operational objectives

Using table 1b.4.3 fill in table 1b.6.1 below to give an overall view of the goals and operational objectives. When filling in the table, if possible, put linked legal obligations, policy goals or operational objectives or management goals or operational objectives on one line. Where a legal obligation or policy goal or operational objective is additional to a management plan or where a management plan does not exist this column will remain empty.
Defined area, time scale and review period may not be equal between legal obligations, policy and management goals and operational objectives. In this case use the specifics of the management plan, as this is a SMART tool for management of the Marine Area.

Table 1b.6.1 Goals and operational objectives related to fisheries management plans (the ones in place)

Legal obligations	Policy goals or operational objectives	Management plan goals or operational objectives	Define the area for the objectives(entire case study area, or just a specific part)	When should the goal be achieved?	How often will the goal be reviewed?
1_1, 1_2, 2_1, 10_1, 74, 75, 76,	Reduction of fishing mortality to	[Der1] Substantial reduction (say	Waters within 12 nm of the Italian coastline, but	2013	Between 6 months and 5 years, on

77, 78, 79, 80, 81, 82, 83, 92_2, 106_2, 108_2, 110, 111c_4, 116, 116b, 118, 145_1, 181_4, 189b, 195_1, 200, 200b, 201, 212_1, 235_2, 236_2] plus National Operative Program for the fishery sector in Italy, National Strategic Program, Management Plan for Trawl in GSA 10, Management Plan for Trawl > 18m lob in GSA 16, Management Plan for fishing vessels lob < 18 m in Sicily, National Management Plan for boat seines	reference values (specific for each sector and indicator) through the reduction of fishing effort by (roughly) 20%	20%) and rationale spatial allocation of fishing effort by 2013	some provisions affect EU vessels and citizens in the high sea		depending of the availability of data for specific indicators. Undefined in many instances ("whenever suggested by annual reports")
[2_7, 3_1, 4_1, 5_1, 7_1, 8_1, 6_1, 6_2, 10_1, 66_2, 70, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 89_1, 89_2, 89_3, 91_4,	Sustainable fisheries	[Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental	Waters within 12 nm of the Italian coastline, but some provisions affect EU vessels and citizens in the high sea	2013	Between 6 months and 5 years, on depending of the availability of data for specific indicators. Undefined in many instances

92_1, 93, 96_2, 96_3, 96_4, 96_7, 97_1, 102_1, 102_3, 102_5, 102_6, 103b, 104_1, 105, 106_1, 106_2, 108_1, 108_2, 109_2, 109b_2, 111c_2, 111c_4, 111c_5, 111c_6, 111c_7, 111c_8, 115a, 116, 116b, 117, 118, 120, 122_1, 122_2, 122_4, 123, 124, 126, 127, 133, 134b, 134c, 134f, 135, 136, 137, 137f, 137e, 138b_3, 138c_4, 139, 145_1, 145_4, 148, 149_2, 157, 166_2, 168, 179_1, 179_2, 179_3, 180, 181_2, 182_4, 183_2, 185c, 185d, 185e, 188b, 191b, 193b, 195_2, 195_3, 195_4, 195_5, 198, 200, 200b, 201, 207, 209, 212_1,		variability within a given date			("whenever suggested by annual reports")

212_2, 215, 216, 218, 229_3, 234, 235_1, 236_1] plus National Operative Program for the fishery sector in Italy, National Strategic Program, Management Plan for Trawl in GSA 10, Management Plan for Trawl > 18m lob in GSA 16, Management Plan for fishing vessels lob < 18 m in Sicily, National Management Plan for boat seines					
[1_2, 1_3, 2_2, 2_3, 2_4, 2_5, 2_8, 3_2, 4_2; 5_2, 7_2, 8_2, 10_2, 3_3, 4_3, 5_3, 7_3, 8_3, 10_3, 6_3, 63_1, 97_4, 97_5, 134, 97_6, 104_4, 104_5, 104_6, 106_2, 108_2, 111, 111c_7, 112, 112b, 113, 118, 122b_1,	Economically viable fishing industry providing employment and opportunities for coastal communities	[Der2] financial viability and safe working conditions for fishermen by 2013	Waters within 12 nm of the Italian coastline, but some provisions affect EU vessels and citizens in the high sea	2013	Between 6 months and 5 years, on depending of the availability of data for specific indicators. Loosely defined in many instances ("whenever suggested by annual reports")

127, 133, 138b_2, 138c_4, 140b_1, 145_2, 145_3, 147c_1, 147c_2, 181_3, 181_5, 182_1, 183_2, 183_3, 183_5, 188c, 189, 200, 200b, 201, 212_5, 212_7, 224, 229_1, 229_2, 229b, 230b_1, 235_5, 235_6, 236_5, 236_6] plus National Operative Program for the fishery sector in Italy, National Strategic Program, Management Plan for Trawl in GSA 10, Management Plan for Trawl > 18m lob in GSA 16, Management Plan for fishing vessels lob < 18 m in Sicily, National Management Plan for boat seines					

[2_6, 15, 16, 17, 18, 60, 61, 63_1, 63_2, 66_1, 67, 68_1, 68_2, 69, 70, 84, 85, 86_1, 86_2, 86_3, 86b_1, 86b_2, 87, 89_1, 90_1, 90_2, 90_3, 90_4, 91_1, 91_2, 91_3, 91_4, 94, 95, 96, 96_1, 96_3, 96_4, 96_5, 96_6, 96_7, 97_1, 97_2, 97_3, 97_4, 97_5, 98, 99, 100, 101_1, 101_2, 101_3, 101_4, 102_1, 102_2, 102_4, 102_5, 102_6, 103a, 103b, 104_1, 104_2, 104_3, 104_4, 105_5, 107, 109_1, 109_2, 109b_1, 109b_2, 111b, 111c_1, 111c_2, 111c_3, 111c_5, 111c_8, 114, 115b, 115d, 117, 119, 121, 122_3, 122b_2, 123, 125_1, 125_2, 125b_1,	Healthy marine environment	[Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020	Waters within 12 nm of the Italian coastline, but some provisions affect EU vessels and citizens in the high sea	2013	Between 6 months and 5 years, on depending of the availability of data for specific indicators. Loosely defined in many instances (“whenever suggested by annual reports”)

125b_2, 125b_3, 125b_4, 125c, 129_1, 129_2, 129_3, 129_4, 129_5, 130, 131, 132b_1, 132b_2, 132b_2.1, 132b_2.2, 132b_2.3, 132b_2.4, 134, 134c, 134d, 134e, 134f, 137c_1, 137d, 137e, 138_1, 138_2, 138_3, 138b_1, 138b_4, 138c_1, 138c_2, 138c_3, 138c_5, 140_1, 140_2, 140b_2, 141_1, 141_2, 141_3, 141_4, 141b, 142, 142b, 142c, 143, 143_1, 143_2, 143_3, 143_4, 143_5, 143b, 144, 144b, 146_1, 146_3, 146_4, 147, 147b, 147c_1, 147c_2, 149, 149_1, 149_2, 150_1, 150_2,					

150_3, 150_4, 151, 152, 153, 154, 155, 156, 158, 159, 160, 161, 162, 163, 164, 166_1, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 182_1, 182_2, 183_1, 183_2, 183_3, 183_4, 184, 185, 186_1, 186_2, 186_3, 187, 188, 190, 191, 193, 194, 196, 197, 198, 199, 202, 203, 204, 205, 206, 208, 210, 213, 214, 217, 219, 220, 221, 222, 223, 225, 226, 227, 228, 231, 232, 239] plus National Operative Program for the fishery sector in Italy, National Strategic Program, Management Plan for Trawl in GSA 10, Management					

Plan for Trawl > 18m lob in GSA 16, Management Plan for fishing vessels lob < 18 m in Sicily, National Management Plan for boat seines					
[101_4, 150_1, 183_1, 188c]	Conservation of natural and cultural heritage (sites of particular importance because of their scientific, aesthetic, cultural or educational interest)	[Der5] Preservation of specific issues regarding the cultural heritage (say artisanal fisheries) within a given date	Human settlements in the islands within the study area	NA	NA
Council Regulation (EC) 1967/2006		[A1] Assessment of the stocks for the most important commercial species	25 Nautical Mile Fisheries Zone (FMZ)	Ongoing	Annually
		[A2] Identification of 'essential fish habitats' for the most important stocks		Ongoing	Annually
		[A3] Identification of current trawling grounds both spatially and temporally			
		[A4] Using fishing effort as an indicator of trawling pressure		2014	Annually

		[A5] Identifying the impacts of trawling on the fishing grounds, including the commercial species, non-commercial species and habitats and its relationship to trawling pressure		2015	Annually
		[A6] Possibility of the relocation of fishing effort and the current authorized trawling grounds		2015	Annually
		[A7] The supply of continuous information of the state of demersal resources		ongoing	Annually
		[A8] Identification and characterization of the biogenesis in territorial waters		2014	Annually
		[A9] Identification and characterization of habitats listed in the habitats directive especially in trawling grounds		2014	Annually
		[A10] Characterization of the discards from the trawl fishery in terms of species composition, biomass and density indices		2012	Annually
		[A11] Identification of incidental		2012	Annually

		captures of any protected species especially in trawling grounds			
		[A12] Identification of critical habitats for species of bird fauna			
		[A13] Possibility of introducing mitigating measures for the protection of habitats protected species and reduction of discards		2015	Annually
		[A14] Development of a monitoring program to monitor the evaluation of the protection measures		2015	Annually
		[A15] Assess current socio-economic situation of fishery		Ongoing	Annually
		[A16] Assess likely socio-economic impacts of management measures proposed to manage fishery		2013	Annually
		[B1] Characterization of the associated species caught together with the dolphinfish in terms of species composition abundance and biomass and collection of		Ongoing	Annually

		biological stock related parameters			
		[B2] Assessment of the dolphinfish stocks		2012 (subject to successful collaboration with scientists from neighbouring countries exploiting the same stock)	Annually
		[B3] Monitoring of the dolphinfish stocks		2012 (subject to successful collaboration with scientists from neighbouring countries exploiting the same stock)	Annually
		[B4] Identification of the impact of the fish aggregating devices (FADs) and seine nets on non-commercial species caught in the fishery		2013	Annually
		[B5] Identification of the impact of the limestone slabs and nylon ropes used for the FADs on the benthic environment		2015	Annually
		[B6] Research activities to identify alternative materials to construct FADs		2014	Annually

		[B7] Possibility of introducing mitigation measures for the protection of any negative impacts resulting from B4 and B5		2015	Annually
		[B8] Assess current socio-economic situation of fishery		Ongoing	Annually
		[B9] Assess likely socio-economic impacts of management measures proposed to manage fishery		2015	Annually
		[C1] Characterization of the associated species caught together with the target purse seine catch in terms of species composition abundance and biomass and collection of biological stock related parameters		Ongoing	Annually
		[C2] Assessment of the small pelagic stocks`		2014	Annually
		[C3] Monitoring of the small pelagic stocks		2014	Annually

		[C4] Identification of the impact of the purse seine nets on non-commercial species caught in the fishery		Ongoing	Annually
		[C5] Possibility of introducing mitigating measures for the protection of any negative impacts resulting from C4.		2014	Annually
		[C6] Assess current socio-economic situation of fishery		Ongoing	Annually
		[C7] Assess likely socio-economic impacts of management measures proposed to manage fishery		2017	Annually
		[D1] Characterization of the associated species caught together with target seine catch in terms of species composition abundance and biomass and collection of biological stock related parameters		ongoing	Annually
		[D2] Assessment of target stock Aphia minuta		2014	Annually
		[D3] Monitoring of the target stock		2014	Annually

		[D4] Identification of the impact of the seine nets on non-commercial species caught in the fishery		ongoing	Annually
		[D5] Possibility of introducing mitigating measures for the protection of any negative impacts resulting from D4		2014	Annually
		[D6] Assess current socio-economic situation of fishery		ongoing	Annually
		[D7] Assess likely socio-economic impacts of management measures proposed to manage fishery		2017	Annually

Using the list of operational objectives in table 1b.6.1, rank the operational objectives in order of importance depending on the higher level goals of the SMA. Fill out table 1b.6.2 to reflect this giving information on reasons why these decisions were made. Indicate in table 1b.6.2 which objective you are going to focus on throughout the rest of the evaluation.

Table 1b.6.2

Operational objective	Rank	Reasons
[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013	1	Necessary for the objective ranked 2nd
[Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020	2	Necessary for the objective ranked 3rd

[Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date	3	Necessary for the objective ranked 4th
[Der2] Financial viability and safe working conditions for fishermen by 2013	4	Necessary for the objective ranked 5th
[Der5] Preservation of specific issues regarding the cultural heritage (say artisanal fisheries) within a given date	5	One of the few ways to achieve the objective ranked 1st in practice
A1 – assessment of the stocks for the most important commercial species		
A2 – identification of 'essential fish habitats' for the most important stocks		
A3- identification of current trawling grounds both spatially and temporally		
A4- using fishing effort as an indicator of trawling pressure		
A5- identifying the impacts of trawling on the fishing grounds, including the commercial species, non-commercial species and habitats and its relationship to trawling pressure		
A6-possibility of the relocation of fishing effort and the current authorized trawling grounds		
A7- the supply of continuous information of the state of demersal resources		
A8- identification and characterization of the biogenesis in territorial waters		
A9- identification and characterization of habitats listed in the habitats directive especially in trawling grounds		
A10- characterization of the discards from the trawl fishery in terms of species composition, biomass and density indices		
A11- identification of incidental captures of any protected species especially in trawling grounds		
A12- identification of critical habitats for species of bird fauna		

A13 – possibility of introducing mitigating measures for the protection of habitats protected species and reduction of discards		
A14- development of a monitoring program to monitor the evaluation of the protection measures		
A15- assess current socio-economic situation of fishery		
A16- assess likely socio-economic impacts of management measures proposed to manage fishery		

Action 1b.7: Identifying stakeholders

Stakeholder participation is required at several steps in the framework and will be facilitated by the governance research analysis. Here all relevant stakeholders and their interests in the area will be explored through the governance analysis in WP6.

Step 2 Existing information collation and mapping

Step 2a: Identify ecosystem components

The aim of step 2a is to identify the ecosystem components in the SMA which are relevant to the objectives that have been set in step 1b. Ecosystem components can be divided into natural (biophysical) (e.g. marine mammals) and socio-economic components (e.g. a wind farm). A list of natural ecosystem components taken from the MSFD annex iii has been provided to give guidance on identifying the relevant ones. This is not an exhaustive list and it can be added to and expanded depending on the SMA that is being evaluated. Once ecosystem components are identified for the area they need to be mapped using GIS tools. Mapping should be done using the appropriate scale for each component (e.g. larger scales for marine mammals which are distributed over wide areas) and the GIS maps should aim to cover the entire SMA. The output from step 2a should be a list of relevant ecosystem components along with GIS maps of their coverage where possible.

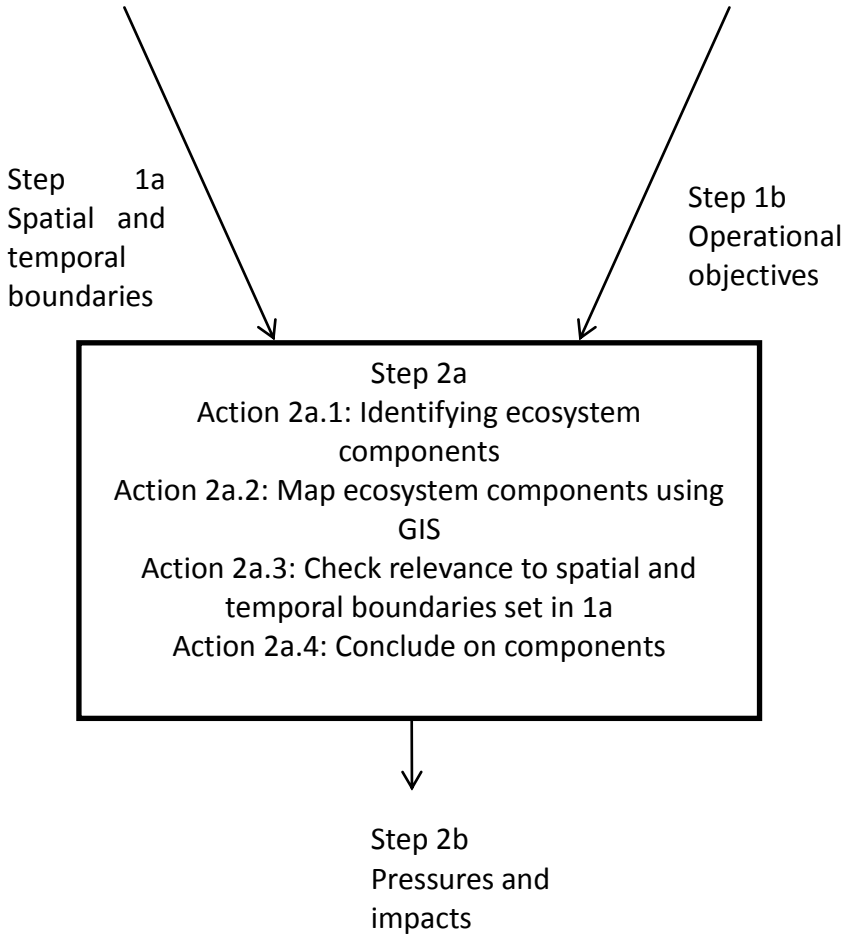


Figure 2a.1: Work flow for step 2a

Action 2a.1: Using table 2a.1.1 provided identify the ecosystem components relevant to SMA and the objectives defined in 1b.

Table 2a.1.1: MSFD list of ecosystem components (Table has been taken from the MSFD annex iii and can be added to depending on the SMA under evaluation).

Type	Ecosystem component
Physical and chemical	Topography and bathymetry of the seabed
	Temperature regime, current velocity, upwelling, wave exposure, mixing characteristics, turbidity and residence time
	Salinity
	Nutrients
	Marine acidification
Habitat types	Predominant habitat types
	Special habitat types
	Identification of habitats in special areas
Biological features	Biological communities including phytoplankton and zooplankton communities
	Angiosperms, macro-algae and invertebrate bottom fauna
	Fish populations
	Marine mammals and reptiles
	Seabirds
	Protected species
	Exotic species
Other features	Chemicals
	Any other features or characteristics typical of or specific to the SMA

Fill out table 2a.1.2 below with the list of ecosystem components in the SMA. Indicate where these have been taken from table 2a.1.1 above or another reference and indicate which operational objective listed in step 1b the component is relevant to.

Table 2a.1.2

Ecosystem component	Reference (e.g. MSFD or other)	Relevant objective
Topography and bathymetry of the seabed	MSFD, British Oceanographic Data Centre (GEBCO), IAMC	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality,

		landscape integrity…) by 2020
Surface circulation pattern	MSFD, IAMC	[Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date
Predominant habitat types (benthic biocenosis)	MSFD, IAMC	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date
Special habitat types (nurseries)	MSFD, IAMC	[Der1] Substantial reduction (say 20%) and rationale spatial ; [Der2] financial viability and safe working conditions for fishermen by 2013allocation of fishing effort by 2013; [Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date
(Demersal) fish populations	MSFD, Italian GRUND, Mediterranean MEDITS	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [Der2] financial viability and safe working conditions for fishermen by 2013; [Der4]

		Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date
Distribution of fishing effort	GFCM	[Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date
FAO Geographical SubAreas	FAO	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [Der2] financial viability and safe working conditions for fishermen by 2013; [Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date
Territorial and Fisheries Limits	IAMC	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [Der2] financial viability and safe working conditions for fishermen by 2013; [Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability

		within a given date
Ports (Commercial, Fishing)	Italian Hydrographic Institute of Italian Navy	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [Der2] financial viability and safe working conditions for fishermen by 2013; [Der5] Preservation of specific issues regarding the cultural heritage (say artisanal fisheries) within a given date
Fish biodiversity	IAMC	[Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date
Spawning areas of target species	IAMC	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [Der2] financial viability and safe working conditions for fishermen by 2013; [Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date
Petroleum and gas facilities	Ministry of Economic Development	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [Der4] Sustainable exploitation of natural resources in the face

		of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date
Shipwrecks	Ministry of the Environment - ISPRA	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013
Untrawlable areas	IAMC	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date; [Der5] Preservation of specific issues regarding the cultural heritage (say artisanal fisheries) within a given date
Marine protected areas (MPAs)	Ministry of the Environment	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [Der2] financial viability and safe working conditions for fishermen by 2013; [Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date; [Der5] Preservation of specific issues

		regarding the cultural heritage (say artisanal fisheries) within a given date
Natura 2000 Sites of Community Importance (SCIs)	Sicilian Regional Government	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020
Natura 2000 Special Protection Areas (SPAs)	Sicilian Regional Government	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020
Specially Protected Areas of Mediterranean Importance (SPAMIs)	UNEP Mediterranean Action Plan	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020
Projected offshore wind farms	FourWind Ltd	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs,

		ecosystem functionality, landscape integrity…) by 2020; [Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date
Italian continental shelf limits	Ministry of Economic Development	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date
Underwater cables	Hydrographic Institute of Italian Navy	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013
Underwater pipelines	Hydrographic Institute of Italian Navy	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013

Action 2a.2: Collect spatial information on ecosystem components / map ecosystem component

When collating spatial maps of ecosystem components the following aspects should be outlined:

- How will the maps be stored? ESRI shapefiles
- What scale of mapping will be used? This will vary depending on the component being mapped e.g. a special habitat type may be mapped in a much finer resolution than the breeding grounds of seabirds. 1: 5000 to 1: 10 000 (for Maltese islands only – stil have to decide how to join with sicilians
- Further details regarding co-ordinate systems, map projections and meta-data standards are outlined further under the 'manual user guide'.
    - Universal Transverse Mercator - zone 33N, WGS 1984
    - Metadata - geonetwork
- Restrictions on use or publication of existing spatial data. Will depend on each layer data source

These issues should be discussed and decided upon before taking any further action in close cooperation with WP5. Where possible, maps should cover the entire SMA.

Good information

Where there is good information available on the ecosystem components listed in table 2a.1.2 above collate relevant GIS layer files in as much detail as possible about the spatial coverage of that ecosystem component.

Intermediate information

Where information on ecosystem components is not readily available then use expert judgement to compile GIS layer files on the spatial coverage of the ecosystem component. This may just be a rough polygon layer showing the possible area the component is likely to cover.

Poor/ no information

Where there is poor or no data available then any available literature on the ecosystem components should be compiled that may enable a judgement to be made.

Action 2a.3: Ensure information is relevant to the spatial and temporal boundaries set in 1a

The information on ecosystem components should be both relevant to the spatial and temporal boundaries that were identified in step 1a. Where possible, information should be available that is covering most of the area (with the appropriate scales of mapping within the area, see above) and the timescale should be chosen appropriately.

Action 2a.4: Conclude on all relevant ecosystem components

Fill out table 2a.4 below which concludes on all ecosystem components relevant to the SMA.

Table 2a.4

Ecosystem component	Relevant objective	Spatial coverage (good/poor)	Temporal coverage (good/poor)
Topography and bathymetry of the seabed	[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…)	Good	Good / not relevant

	by 2020		
Surface circulation pattern	[D3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [D4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date	Good	Poor
Predominant habitat types (benthic biocenosis): EUNIS A5.39, A5.46, A5.47, A5.51, A6.31, A6.513 and A6.61	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [D3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [D4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date	Good / Intermediate	Good / Intermediate
Special habitat types (nurseries)	[D1] Substantial reduction (say 20%) and	Good / Intermediate	Good / Intermediate

	rationale spatial ; [D2] financial viability and safe working conditions for fishermen by 2013allocation of fishing effort by 2013; [D4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date		
Biological communities including phytoplankton and zooplankton communities			poor
(Demersal) fish populations	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [D2] financial viability and safe working conditions for fishermen by 2013; [D4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date	Good	Good
FAO Geographical SubAreas	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [D2] financial viability and safe working conditions for fishermen by 2013; [D4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date	Good	Good

FAO Geographical SubAreas	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [D2] financial viability and safe working conditions for fishermen by 2013; [D4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date	Good	Good
Territorial and Fisheries Limits	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [D2] financial viability and safe working conditions for fishermen by 2013; [D3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [D4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date	Good	Good
Ports (Commercial, Fishing)	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [D2]	Good	Good

	financial viability and safe working conditions for fishermen by 2013; [D5] Preservation of specific issues regarding the cultural heritage (say artisanal fisheries) within a given date		
Fish biodiversity	[D3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [D4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date	Good	Good
Spawning areas of target species	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [D2] financial viability and safe working conditions for fishermen by 2013; [D4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date	Good	Good
Petroleum and gas facilities	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [D3]	Good	Poor

	Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [D4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date		
Shipwrecks	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013	Good	Poor
Untrawlable areas	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [D3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [D4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given	Good	Good

	date; [D5] Preservation of specific issues regarding the cultural heritage (say artisanal fisheries) within a given date		
Marine protected areas (MPAs)	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [D2] financial viability and safe working conditions for fishermen by 2013; [D3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [D4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date; [D5] Preservation of specific issues regarding the cultural heritage (say artisanal fisheries) within a given date	Good	Good
Natura 2000 Sites of Community Importance (SCIs)	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [D3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity	Good	Good

	components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020		
Natura 2000 Special Protection Areas (SPAs)	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [D3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020	Good	Good
Specially Protected Areas of Mediterranean Importance (SPAMIs)	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [D3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020	Good	Good
Projected offshore wind farms	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [D3] Nature conservation, environmental	Good	Poor

	protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [D4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date		
Italian continental shelf limits	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013; [D3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020; [D4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date	Good	Good
Underwater cables	[D1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013	Good	Good
Underwater pipelines	[D1] Substantial	Good	Good

	reduction (say 20%) and rationale spatial allocation of fishing effort by 2013		

Step 2b: Identify pressures and impacts

The aim of step 2b is to analyse the spatial overlap of the distribution pattern of the relevant natural and socio-economic ecosystem components with pressures and impacts and an assessment of potential interactions. The first action is to identify sectors, future uses and the pressures these exert on the ecosystem components identified in step 2a. Collation of spatial information on pressures and impacts via GIS is an important next step. Data may be collected from models (e.g. current speed, wave action, tidal range, distribution of nutrients, primary production etc) or by geostatistics based on a coarse sampling program (sediment, biota etc). Finally, potential cumulative impacts of pressures are identified. The final output of step 2b is a list of pressures and, depending on the availability of data, GIS maps showing their cumulative impacts on ecosystem components or a table of ecosystem component sensitivity information.

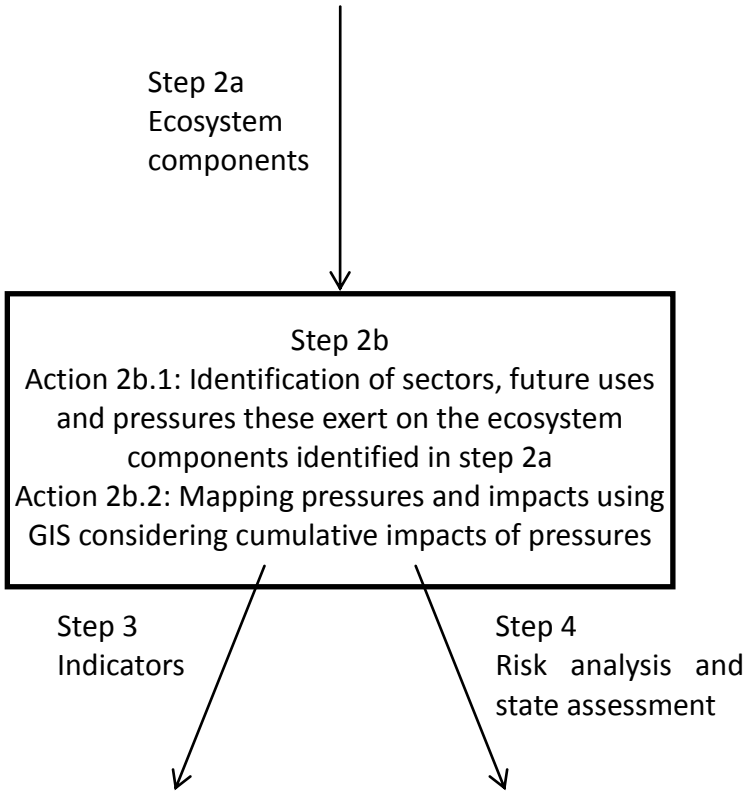


Figure 2b.1: Work flow for step 2b

Action 2b.1: Identification of sectors, future uses and pressures these exert on the ecosystem components identified in step 2a.

Sectors, activities and the pressures these exert on the ecosystem components can be identified using table 2b.1.1 **(this table is large so it will be made available on the sharepoint to accompany the manual)**. This table, taken from the MarLIN initiative (see http://www.marlin.ac.uk/maritimeactivitiesmatrix.php, for details) identifies sectors, their activities and the pressures and impacts they have on the marine environment. Using information collected in step 1 of the manual, identify from the first column in table 2b.1.1 the sectors that are relevant to the SMA. Next, identify which activities (from the second column) of each sector are carried out within the SMA. Finally, use the key to list the key pressures that are likely to be having a possible (might happen) or probable (very likely to happen) effect from that sector in the SMA. Fill out table 2b.1.2 to summarise the sectors, activities, pressures and impacts likely to be occurring in the SMA and to indicate if this is a possible or probable effect. The field “Sensitivity to human activities”

provided for each European marine habitat in the MESMA Catalogue of European seabed biotopes (Deliverable D1.2) will be helpful to complete this step.

Table 2b.1.2

Sector	Activity	Pressure	Probable (R) or possible (P)?
Climate change	Current change	Changes in turbifity	P*
		Displacement	R
	Temperature change	Displacement	R
		Displacement	P
Aquaculture	Fin-fish	Suspended sediment	R
		Noise disturbance	P
		Visual presence	P
		Synthetic compound contamination	R
		Changes in nutrient levels	R
Development	Construction phase	Substratum loss	R
		Smothering	R
		Suspended sediment	R
		Changes in turbidity	R
		Noise disturbance	R
		Abrasion/Physical disturbance	R
		Displacement	R
		Hydrocarbon contamination	P
	Oil and gas platforms	Changes in turbidity	R
		Noise disturbance	R
		Abrasion/Physical disturbance	R
		Hydrocarbon contamination	R
	Pipelines	Substrate loss	R*
		Smothering	R*
		Suspended sediment	R*
		Changes in turbidity	R*
	Artificial Reefs	Smothering	P
		Suspended sediment	R
		Changes in water flow rate	R
		Changes in turbidity	R
		Synthetic compound contamination	P
		Heavy metal contamination	P
		Hydrocarbon contamination	P
		Changes in nutrient levels	P
		Changes in oxygenation	P
	Communication cables	Smothering	P
		Suspended sediment	R
		Changes in water flow rate	R
		Changes in turbidity	R
		Visual presence	R
		Synthetic compound contamination	P

	Dock / port facilities	Substratum loss	R
		Smothering	R
		Suspended sediment	R
		Changes in water flow rate	R
		Changes in temperature	P
		Changes in turbidity	R
		Changes in wave exposure	R
		Noise disturbance	R
		Visual presence	R
		Abrasion / physical disturbance	R
		Displacement	R
		Synthetic compound contamination	R
		Heavy metal contamination	P
		Hydrocarbon contamination	R
		Changes in nutrient levels	R
		Changes in salinity	P
		Changes in oxygenation	R
		Introduction of microbial pathogens / parasites	R
		Introduction of non-native species	R
	Marinas	Smothering	R
		Suspended sediment	R
		Changes in water flow rate	R
		Changes in temperature	P
		Changes in turbidity	R
		Changes in wave exposure	R
		Noise disturbance	R
		Visual presence	R
		Abrasion / physical disturbance	R
		Displacement	R
		Synthetic compound contamination	R
		Heavy metal contamination	P
		Hydrocarbon contamination	R
		Changes in nutrient levels	R
		Changes in oxygenation	R
		Introduction of microbial pathogens / parasites	R
		Introduction of non-native species	R
	Oil and gas platform	smothering	R
		Suspended sediment	P
		Changes in water flow rate	R
		Changes in turbidity	R
		Noise disturbance	R
		Visual presence	R
		Abrasion / physical disturbance	R
		Synthetic compound	R

		contamination	
		Heavy metal contamination	R
		Hydro carbon contamination	R
		Changes in nutrient levels	P
Energy regeneration	Power station	Suspended sediment	R
		Change in temperature	R
		Change in turbidity	R
		Noise disturbance	R
		Visual presence	R
		Synthetic compound contamination	R
		Heavy metal contamination	R
		Hydro carbon contamination	P
		Changes in nutrient levels	R
		Changes in salinity	P
		Changes in oxygenation	R
Extraction	Oil and gas	Smothering	R
		Noise disturbance	R
		Visual presence	R
		Synthetic compound contamination	R
		Heavy metal contamination	R
		Hydro carbon contamination	R
		Changes in nutrient levels	R
Fisheries / Shellfisheries	Benthic trawls	Substratum loss	R
		smothering	R
		Suspended sediment	R
		Change in turbidity	R
		Noise disturbance	R
		Visual presence	R
		Abrasion / physical disturbance	R
		Synthetic compound contamination	P
		Heavy metal contamination	P
		Displacement	R
		Hydro carbon contamination	P
		Changes in nutrient levels	R
		Selective extraction of target species	R
		Selective extraction of non-target species	R
	Netting	Noise disturbance	R
		Visual presence	R
		Abrasion / physical disturbance	R
		Displacement	R
		Hydrocarbon contamination	P*
		Selective extraction of target	R

		species	
		Selective extraction of non-target species	R
	Pelagic trawls	Noise disturbance	P
		Visual presence	P
		Selective extraction of target species	R
		Selective extraction of non-target species	R
	Potting / creeling	smothering	R
		Noise disturbance	R
		Visual presence	R
		Abrasion / physical disturbance	R
		Selective extraction of target species	R
		Selective extraction of non-target species	R
Recreation	Angling	Noise disturbance	R
		Abrasion/Physical disturbance	R
		Displacement	P
		Hydrocarbon contamination	P*
		Selective extraction of target species	R
		Selective extraction of non-target species	R
	Boating / yachting	Change in turbidity	P
		Noise disturbance	R
		Visual presence	R
		Abrasion / physical disturbance	R
		Synthetic compound contamination	R
		Heavy metal contamination	P
		Hydrocarbon contamination	R
		Changes in nutrient levels	R
		Changes in oxygenation	R
		Introduction of microbial pathogens / parasites	R
		Introduction of non-native species	R
	Diving / dive sites	Smothering	R*
		Suspended sediment	R*
		Noise disturbance	R
		Abrasion/Physical disturbance	R
		Displacement	R
		Hydrocarbon contamination	P*
		Selective extraction of target species	R
		Noise disturbance	P
		Visual presence	R

Uses	Archaeology	Substratum loss	R
		Smothering	R
		Suspended sediment	R
		Change in turbidity	R
		Noise disturbance	P
		Visual presence	R
		Abrasion / physical disturbance	R
		Displacement	R
		Selective extraction of non-target species	R
		Synthetic compound contamination	P
		Hydrocarbon contamination	P
		Changes in nutrient levels	R
		Changes in oxygenation	P
	Military	Noise disturbance	R
		Abrasion/Physical disturbance	R
		Hydrocarbon contamination	P
		Selective extraction of non-target species	P*
	Mooring / beaching / launching	Smothering	R
		Suspended sediment	R
		Changes in water flow rate	R
		Changes in turbidity	R
		Noise disturbance	R
		Light disturbance	R*
		Visual presence	R
		Abrasion / physical disturbance	R
		Synthetic compound contamination	R
		Heavy metal contamination	R
		Hydro carbon contamination	R
		Displacement	R
		Introduction of microbial pathogens / parasites	P
		Introduction of non-native species	P
	Research	Substratum loss	P
		Noise disturbance	R
		Abrasion/Physical disturbance	R
		Displacement	P
		Hydrocarbon contamination	P
		Selective extraction of target species	R
		Selective extraction of non-target species	P
	Shipping	Suspended sediment	R
		Changes in turbidity	R
		Noise disturbance	R
		Visual presence	R
		Abrasion / physical disturbance	R

		Synthetic compound contamination	P
		Heavy metal contamination	R
		Hydro carbon contamination	R
		Changes in oxygenation	R
		Introduction of microbial pathogens / parasites	R
		Introduction of non-native species	R
Wastes	Fishery and agriculture wastes	Smothering	R
		Suspended sediment	R
		Changes in turbidity	R
	Sewage discharge	Smothering	R
		Suspended sediment	R
		Changes in turbidity	R
		Visual presence	R
		Synthetic compound contamination	R
		Heavy metal contamination	R
		Hydro carbon contamination	R
		Brine discharges	R*
		Changes in nutrient levels	R
		Changes in oxygenation	R
	Shipping wastes	Smothering	R
		Suspended sediment	R
		Changes in turbidity	R
		Visual presence	R
		Synthetic compound contamination	R
		Heavy metal contamination	R
		Hydro carbon contamination	R
		Changes in nutrient levels	R
		Changes in oxygenation	R
		Introduction of microbial pathogens / parasites	R
		Introduction of non-native species	R
	Spoil dumping	Smothering	R
		Suspended sediment	R
		Changes in turbidity	R
		Visual presence	R
		Synthetic compound contamination	P
		Heavy metal contamination	P
		Hydro carbon contamination	P
		Changes in nutrient levels	R
		Changes in oxygenation	R

Action 2b.2: Mapping pressures and impacts using GIS considering cumulative impacts of pressures.

In this step the spatial information on pressures and impacts is collated using GIS. It is important in this task to relate the identified pressure categories to the relevant natural ecosystem components before a more detailed spatial assessment takes place. This can be achieved via table 2b.2.1 below.

Table 2b.2.1 Estimated impacts based on expertise knowledge. Not all impacts detected in table 2b.1.2 were assessed. Natural ecosystem components pooled across substrate type. Many natural ecosystem components not included due to lack of information about spatial distribution or specific impacts

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
Climate change	Current change	Changes in turbidity	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact of low intensity and very large extent; can trigger changes in trophic structure. Highly persistent. Little or no resilience.
Climate change	Current change	Changes in turbidity	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact of low intensity and very large extent; can trigger changes in trophic structure. Highly persistent. Little or no resilience.
Climate change	Current change	Changes in turbidity	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact of low intensity and very large extent; can trigger changes in trophic structure. Highly persistent. Little or no resilience.
Development	Construction phase	Changes in turbidity	Predominant habitat types (benthic muddy	Change in community structure. Pulse

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			biocenosis): A5.39	impacts of high intensity and little medium extent. Little persistence and high resilience.
Development	Construction phase	Changes in turbidity	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impacts of high intensity and medium extent. Medium persistence and resilience
Development	Construction phase	Changes in turbidity	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Pulse impacts of high intensity and medium extent. Very large persistence and very little resilience
Development	Communication cables	Changes in turbidity	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impacts of low intensity and little extent. High persistence and high resilience
Development	Communication cables	Changes in turbidity	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impacts of low intensity and little extent. High persistence and moderate resilience
Development	Communication cables	Changes in turbidity	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impacts of medium intensity and little extent. High

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				persistence and little or no resilience
Development	Oil and gas platforms	Changes in turbidity	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impacts of low intensity and little extent. High persistence and high resilience
Development	Oil and gas platforms	Changes in turbidity	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impacts of low intensity and little extent. High persistence and moderate resilience
Development	Oil and gas platforms	Changes in turbidity	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impacts of medium intensity and little extent. High persistence and little or no resilience
Development	Pipelines	Changes in turbidity	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impacts of low intensity and little extent. High persistence and high resilience
Development	Pipelines	Changes in turbidity	Predominant habitat types Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impacts of low intensity and little extent. High persistence and moderate resilience
Development	Pipelines	Changes in	Predominant	Change in

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
		turbidity	habitat types Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	community structure. Press (chronic) impacts of medium intensity and little extent. High persistence and little or no resilience
Fisheries	Benthic trawls	Changes in turbidity	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impacts of medium intensity and medium extent. Low persistence and high resilience
Fisheries	Benthic trawls	Changes in turbidity	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impacts of high intensity and medium extent. Medium persistence and moderate resilience
Fisheries	Benthic trawls	Changes in turbidity	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impacts of high intensity and medium extent. High persistence and little or no resilience
Recreation	Boating/yatching	Changes in turbidity	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impacts of low intensity and little extent. Low persistence and high resilience
Recreation	Boating/yatching	Changes in turbidity	Predominant habitat types (benthic detritic	Change in community structure. Pulse

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	impacts of low intensity and little extent. Low persistence and high resilience
Recreation	Boating/yatching	Changes in turbidity	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Pulse impacts of low intensity and little extent. High persistence and little or no resilience
Uses	Archaeology	Changes in turbidity	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impacts of medium intensity and medium extent. Medium persistence and high resilience
Uses	Archaeology	Changes in turbidity	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impacts of medium intensity and medium extent. Medium persistence and high resilience
Uses	Archaeology	Changes in turbidity	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Pulse impacts of high intensity and medium extent. High persistence and little or no resilience
Uses	Mooring	Changes in turbidity	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impacts of medium intensity and little extent. Low persistence and high resilience

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
Uses	Mooring	Changes in turbidity	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impacts of medium intensity and little extent. Medium persistence and high resilience
Uses	Mooring	Changes in turbidity	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Pulse impacts of high intensity and medium extent. High persistence and little or no resilience
Uses	Shipping	Changes in turbidity	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact of low intensity and large extent. Low persistence and high resilience
Uses	Shipping	Changes in turbidity	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact of low intensity and large extent. Low persistence and high resilience
Uses	Shipping	Changes in turbidity	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact of low intensity and large extent. Low persistence and high resilience
Wastes	Fishery & agricultural w.	Changes in turbidity	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact of low intensity and large extent. Low persistence and

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				high resilience
Wastes	Fishery & agricultural w.	Changes in turbidity	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact of low intensity and large extent, except locally. Low persistence and high resilience
Wastes	Fishery & agricultural w.	Changes in turbidity	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact of low intensity and large extent, except locally. Low persistence and high resilience
Wastes	Shipping wastes	Changes in turbidity	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact of low intensity and large extent. Low persistence and high resilience
Wastes	Shipping wastes	Changes in turbidity	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact of low intensity and large extent. Low persistence and high resilience
Wastes	Shipping wastes	Changes in turbidity	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact of low intensity and large extent. Low persistence and high resilience
Development	Construction phase	Substratum loss	Predominant habitat types (benthic muddy biocenosis): A5.39	Community dissapearance. Pulse impact of high intensity and localized extent. Low persistence

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				and high resilience
Development	Construction phase	Substratum loss	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Community dissapearance. Pulse impact of high intensity and localized extent. Medium persistence and medium resilience
Development	Construction phase	Substratum loss	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Community dissapearance. Pulse impact of high intensity and localized extent. High persistence and low or no resilience
Development	Pipelines	Substrate loss	Predominant habitat types (benthic muddy biocenosis): A5.39	Community dissapearance. Pulse impact of high intensity and localized extent. Low persistence and high resilience
Development	Pipelines	Substrate loss	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Community dissapearance. Pulse impact of high intensity and localized extent. Medium persistence and medium resilience
Development	Pipelines	Substrate loss	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Community dissapearance. Pulse impact of high intensity and localized extent. High persistence and low or no resilience
Fisheries	Benthic trawls	Substratum loss	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Community dissapearance. Pulse impact of high intensity and localized extent. High persistence

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				and low or no resilience
Uses	Archaeology	Substratum loss	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Community dissapearance. Pulse impact of high intensity and localized extent. High persistence and low or no resilience
Uses	Research	Substratum loss	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Community dissapearance. Pulse impact of high intensity and localized extent. High persistence and low or no resilience
Development	Construction phase	Smothering	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of medium intensity and large extent. Low persistence and high resilience
Development	Construction phase	Smothering	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of medium intensity and large extent. Medium persistence and medium resilience
Development	Construction phase	Smothering	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Community dissapearance. Pulse impact of high intensity and localized extent. High persistence and low or no resilience
Development	Communication cables	Smothering	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of medium intensity and

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				localized extent. Low persistence and high resilience
Development	Communication cables	Smothering	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of medium intensity and localized extent. Medium persistence and medium resilience
Development	Communication cables	Smothering	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Community dissapearance. Pulse impact of high intensity and localized extent. High persistence and low resilience
Development	Oil and gas platforms	Smothering	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of medium intensity and localized extent. Low persistence and high resilience
Development	Oil and gas platforms	Smothering	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of medium intensity and localized extent. Medium persistence and medium resilience
Development	Oil and gas platforms	Smothering	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Community dissapearance. Pulse impact of high intensity and localized extent. High persistence and low resilience
Development	Pipelines	Smothering	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of medium intensity and

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				localized extent. Low persistence and high resilience
Development	Pipelines	Smothering	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of medium intensity and localized extent. Medium persistence and medium resilience
Development	Pipelines	Smothering	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Community dissapearance. Pulse impact of high intensity and localized extent. High persistence and low resilience
Extraction	Oil & gas	Smothering	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact of low to medium intensity and medium extent. Low persistence and high resilience
Extraction	Oil & gas	Smothering	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact of medium to high intensity and medium extent. Medium persistence and medium resilience
Extraction	Oil & gas	Smothering	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Community dissapearance. Press (chronic) impact of high intensity and localized extent. High persistence and low resilience
Fisheries	Benthic trawls	Smothering	Predominant habitat types	Change in community

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			(benthic muddy biocenosis): A5.39	structure. Press (chronic) impact of high intensity and medium extent. Low persistence and high resilience
Fisheries	Benthic trawls	Smothering	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact of high intensity and medium extent. Medium persistence and medium resilience
Fisheries	Benthic trawls	Smothering	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure that can lead to community dissapearance. Press (chronic) impact of high intensity and localized extent. High persistence and low resilience
Recreation	Diving/dive site	Smothering	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of low intensity and localized extent. Low persistence and high resilience
Recreation	Diving/dive site	Smothering	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of low to medium intensity and localized extent. Medium persistence and medium resilience
Recreation	Diving/dive site	Smothering	Predominant habitat types (benthic coralligenous biocenosis):	Community dissapearance. Pulse impact of high intensity and localized extent.

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			A5.51 and A6.61	High persistence and low resilience
Uses	Archaeology	Smothering	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of low intensity and localized extent. Low persistence and high resilience
Uses	Archaeology	Smothering	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of low to medium intensity and localized extent. Medium persistence and medium resilience
Uses	Archaeology	Smothering	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Community dissapearance. Pulse impact of high intensity and localized extent. High persistence and low resilience
Uses	Mooring/beaching	Smothering	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of low intensity and localized extent. Low persistence and high resilience
Uses	Mooring/beaching	Smothering	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of low to medium intensity and localized extent. Medium persistence and medium resilience
Uses	Mooring/beaching	Smothering	Predominant habitat types (benthic coralligenous biocenosis):	Community dissapearance. Pulse impact of high intensity and localized extent.

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			A5.51 and A6.61	High persistence and low resilience
Wastes	Fishery & agricultural w.	Smothering	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of low intensity and localized extent. Low persistence and high resilience
Wastes	Fishery & agricultural w.	Smothering	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of low to medium intensity and localized extent. Medium persistence and medium resilience
Wastes	Fishery & agricultural w.	Smothering	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Community dissapearance. Pulse impact of high intensity and localized extent. High persistence and low resilience
Wastes	Shipping wastes	Smothering	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of low intensity and localized extent. Low persistence and high resilience
Wastes	Shipping wastes	Smothering	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of low to medium intensity and localized extent. Medium persistence and medium resilience
Wastes	Shipping wastes	Smothering	Predominant habitat types (benthic coralligenous biocenosis):	Community dissapearance. Pulse impact of high intensity and localized extent.

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			A5.51 and A6.61	High persistence and low resilience
Development	Construction phase	Suspended sediment	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of low intensity and large extent. Low persistence and high resilience
Development	Construction phase	Suspended sediment	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of medium to high intensity and large extent. Medium to high persistence and medium to low resilience
Development	Construction phase	Suspended sediment	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Community dissapearance. Pulse impact of high intensity and large extent. High persistence and low or no resilience
Development	Communication cables	Suspended sediment	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of low intensity and localized extent. Low persistence and high resilience
Development	Communication cables	Suspended sediment	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of medium intensity and localized extent. Medium persistence and medium resilience
Development	Communication cables	Suspended sediment	Predominant habitat types (benthic	Change in community structure. Pulse

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			coralligenous biocenosis): A5.51 and A6.61	impact of medium to high intensity and localized extent. Low to medium persistence and low to medium resilience
Development	Pipelines	Suspended sediment	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of low intensity and medium to large extent. Low persistence and high resilience
Development	Pipelines	Suspended sediment	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of medium intensity and medium to large extent. Medium persistence and medium resilience
Development	Pipelines	Suspended sediment	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Pulse impact of high intensity and medium to large extent. Large persistence and low or no resilience
Fisheries	Benthic trawls	Suspended sediment	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of medium intensity and medium extent. Low persistence and high resilience
Fisheries	Benthic trawls	Suspended sediment	Predominant habitat types (benthic detritic and sandy	Change in community structure. Pulse medium intensity

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			biocenosis): A5.46, A5.47, A6.31 and A6.513	and medium extent. Medium persistence and medium resilience
Fisheries	Benthic trawls	Suspended sediment	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Pulse impact of medium intensity and medium extent. Large persistence and low or no resilience
Recreation	Diving/dive site	Suspended sediment	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of low intensity and localized extent. Low persistence and high resilience
Recreation	Diving/dive site	Suspended sediment	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of medium intensity and localized extent. Low persistence and high resilience
Recreation	Diving/dive site	Suspended sediment	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Pulse impact of high intensity and localized extent. Large persistence and low resilience
Uses	Archaeology	Suspended sediment	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of medium intensity and medium extent. Low persistence and high resilience
Uses	Archaeology	Suspended sediment	Predominant habitat types (benthic detritic	Change in community structure. Pulse

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	impact of medium intensity and medium extent. Medium persistence and medium resilience
Uses	Archaeology	Suspended sediment	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Pulse impact of high intensity and medium extent. Large persistence and low resilience
Uses	Mooring/beaching	Suspended sediment	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of medium intensity and localized extent. Low persistence and high resilience
Uses	Mooring/beaching	Suspended sediment	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of medium intensity and localized extent. Medium persistence and medium resilience
Uses	Mooring/beaching	Suspended sediment	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Pulse impact of high intensity and localized extent. Large persistence and low resilience
Uses	Shipping	Suspended sediment	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of medium intensity and medium extent. Low persistence and high resilience
Uses	Shipping	Suspended	Predominant	Change in

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
		sediment	habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	community structure. Pulse impact of medium intensity and medium extent. Medium persistence and medium resilience
Uses	Shipping	Suspended sediment	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Pulse impact of high intensity and medium extent. Large persistence and low resilience
Wastes	Fishery & agricultural w.	Suspended sediment	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of medium intensity and large extent. Low persistence and high resilience
Wastes	Fishery & agricultural w.	Suspended sediment	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of medium intensity and large extent. Medium persistence and medium resilience
Wastes	Fishery & agricultural w.	Suspended sediment	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Pulse impact of high intensity and large extent. Large persistence and low resilience
Wastes	Shipping wastes	Suspended sediment	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of medium intensity and large extent. Low persistence and high resilience

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
Wastes	Shipping wastes	Suspended sediment	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of medium intensity and large extent. Medium persistence and medium resilience
Wastes	Shipping wastes	Suspended sediment	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Pulse impact of high intensity and large extent. Large persistence and low resilience
Development	Construction phase	Noise disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in behaviour of motile animals. Disorientation in mammals and possibly also in fishes and cephalopods. Pulse impact of medium intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Development	Construction phase	Noise disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in behaviour of motile animals. Disorientation in mammals and possibly also in fishes and cephalopods. Pulse impact of medium intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				effects
Development	Construction phase	Noise disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in behaviour of motile animals. Disorientation in mammals and possibly also in fishes and cephalopods. Pulse impact of medium intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Development	Oil and gas platforms	Noise disturbance (including sub-surface exploration air guns)	Predominant habitat types (benthic muddy biocenosis): A5.39	Disorientation, damage or death in mammals. Damage or death in fishes and cephalopods. Pulse impact of medium intensity and large extent (on depending on the focused taxa). Low persistence and low but variable resilience (on depending of the focused taxa)
Development	Oil and gas platforms	Noise disturbance (including sub-surface exploration air guns)	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Disorientation, damage or death in mammals. Damage or death in fishes and cephalopods. Pulse impact of medium intensity and large extent (on depending on the focused taxa). Low persistence and low but variable resilience (on

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				depending of the focused taxa)
Development	Oil and gas platforms	Noise disturbance (including sub-surface exploration air guns)	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Disorientation, damage or death in mammals. Damage or death in fishes and cephalopods. Pulse impact of medium intensity and large extent (on depending on the focused taxa). Low but variable persistence and variable resilience (on depending of the focused taxa)
Extraction	Oil & gas	Noise disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Disorientation in mammals and possibly also in fishes and cephalopods. Press (chronic) impact of medium intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Extraction	Oil & gas	Noise disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Disorientation in mammals and possibly also in fishes and cephalopods. Press (chronic) impact of medium intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Extraction	Oil & gas	Noise	Predominant	Disorientation in

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
		disturbance	habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	mammals and possibly also in fishes and cephalopods. Press (chronic) impact of medium intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Fisheries	Benthic trawls	Noise disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Disorientation in mammals and possibly also in fishes and cephalopods. Changes in behaviour of motile animals. Press (chronic) impact of medium intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Fisheries	Benthic trawls	Noise disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Disorientation in mammals and possibly also in fishes and cephalopods. Changes in behaviour of motile animals. Press (chronic) impact of medium intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				effects
Fisheries	Benthic trawls	Noise disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Disorientation in mammals and possibly also in fishes and cephalopods. Changes in behaviour of motile animals. Press (chronic) impact of medium intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Fisheries	Netting	Noise disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in behaviour of motile animals. Press (chronic) impact of low intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Fisheries	Netting	Noise disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in behaviour of motile animals. Press (chronic) impact of low intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Fisheries	Netting	Noise disturbance	Predominant habitat types (benthic coralligenous	Changes in behaviour of motile animals. Press (chronic)

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			biocenosis): A5.51 and A6.61	impact of low intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Recreation	Angling	Noise disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in behaviour of motile animals. Pulse impact of low intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Recreation	Angling	Noise disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in behaviour of motile animals. Pulse impact of low intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Recreation	Angling	Noise disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in behaviour of motile animals. Pulse impact of low intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Recreation	Boating/yatching	Noise disturbance	Predominant habitat types (benthic muddy biocenosis):	Changes in behaviour of motile animals. Pulse impact of

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			A5.39	low intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Recreation	Boating/yatching	Noise disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in behaviour of motile animals. Pulse impact of low intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Recreation	Boating/yatching	Noise disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in behaviour of motile animals. Pulse impact of low intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Recreation	Diving/dive site	Noise disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in behaviour of motile animals. Pulse impact of low intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Recreation	Diving/dive site	Noise disturbance	Predominant habitat types (benthic detritic and sandy biocenosis):	Changes in behaviour of motile animals. Pulse impact of low intensity and

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			A5.46, A5.47, A6.31 and A6.513	large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Recreation	Diving/dive site	Noise disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in behaviour of motile animals. Pulse impact of low intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Uses	Archaeology	Noise disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in behaviour of motile animals. Pulse impact of low intensity and medium extent (on depending on the focused taxa). Low persistence and high resilience
Uses	Archaeology	Noise disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in behaviour of motile animals. Pulse impact of low intensity and medium extent (on depending on the focused taxa). Low persistence and high resilience
Uses	Archaeology	Noise disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in behaviour of motile animals. Pulse impact of low intensity and medium extent (on depending on the focused taxa). Low persistence and high resilience

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
Uses	Military	Noise disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Disorientation, damage or death in mammals. Lack of data about other taxa. Pulse impact of high intensity and large extent (on depending on the focused taxa). Variable persistence and variable resilience (on depending of the focused taxa)
Uses	Military	Noise disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Disorientation, damage or death in mammals. Lack of data about other taxa. Pulse impact of high intensity and large extent (on depending on the focused taxa). Variable persistence and variable resilience (on depending of the focused taxa)
Uses	Military	Noise disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Disorientation, damage or death in mammals. Lack of data about other taxa. Pulse impact of high intensity and large extent (on depending on the focused taxa). Variable persistence and variable resilience (on depending of the focused taxa)
Uses	Mooring/beaching	Noise disturbance	Predominant habitat types (benthic muddy biocenosis):	Changes in behaviour of motile animals. Pulse impact of

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			A5.39	low intensity and medium extent (on depending on the focused taxa). Low persistence and high resilience
Uses	Mooring/beaching	Noise disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in behaviour of motile animals. Pulse impact of low intensity and medium extent (on depending on the focused taxa). Low persistence and high resilience
Uses	Mooring/beaching	Noise disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in behaviour of motile animals. Pulse impact of low intensity and medium extent (on depending on the focused taxa). Low persistence and high resilience
Uses	Research	Noise disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in behaviour of motile animals. Pulse impact of low intensity and small extent (on depending on the focused taxa). Low persistence and high resilience
Uses	Research	Noise disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in behaviour of motile animals. Pulse impact of low intensity and small extent (on depending on the focused taxa). Low persistence and high resilience
Uses	Research	Noise disturbance	Predominant habitat types (benthic	Changes in behaviour of motile animals.

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			coralligenous biocenosis): A5.51 and A6.61	Pulse impact of low intensity and small extent (on depending on the focused taxa). Low persistence and high resilience
Uses	Shipping	Noise disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in behaviour of motile animals. Press (chronic) impact of low intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Uses	Shipping	Noise disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in behaviour of motile animals. Press (chronic) impact of low intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Uses	Shipping	Noise disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in behaviour of motile animals. Press (chronic) impact of low intensity and large extent (on depending on the focused taxa). Low persistence and high resilience, but unknown chronic effects
Development	Construction phase	Abrasion/Physical disturbance	Predominant habitat types (benthic muddy	Habitat loss and environmental change. Changes in

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			biocenosis): A5.39	the structure of nearby communities. Press (chronic) impact of high intensity and localized extent. High persistence and low resilience
Development	Construction phase	Abrasion/Physical disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Habitat loss and environmental change. Changes in the structure of nearby communities. Press (chronic) impact of high intensity and localized extent. High persistence and low resilience
Development	Construction phase	Abrasion/Physical disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Habitat loss and environmental change. Changes in the structure of nearby communities. Press (chronic) impact of high intensity and localized extent. High persistence and low resilience
Development	Oil and gas platforms	Abrasion/Physical disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Habitat loss and environmental change. Changes in the structure of nearby communities. Press (chronic) impact of high intensity and localized extent. High persistence and low resilience
Development	Oil and gas platforms	Abrasion/Physical disturbance	Predominant habitat types (benthic detritic	Habitat loss and environmental change. Changes in

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	the structure of nearby communities. Press (chronic) impact of high intensity and localized extent. High persistence and low resilience
Development	Oil and gas platforms	Abrasion/Physical disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Habitat loss and environmental change. Changes in the structure of nearby communities. Press (chronic) impact of high intensity and localized extent. High persistence and low resilience
Fisheries	Benthic trawls	Abrasion/Physical disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact of medium (diffused) intensity and localized extent. Low persistence and high resilience
Fisheries	Benthic trawls	Abrasion/Physical disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact of medium (diffused) intensity and localized extent. Medium persistence and medium resilience
Fisheries	Benthic trawls	Abrasion/Physical disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact of medium (diffused) intensity and localized extent. High persistence

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				and low resilience
Fisheries	Netting	Abrasion/Physical disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in surface community structure. Pulse impact of low intensity and localized extent. Low persistence and high resilience
Fisheries	Netting	Abrasion/Physical disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Loss of erect habitat-forming species. Change in community structure. Pulse impact of low to medium intensity (depending of the focused taxa) and localized extent. Low to medium persistence and medium resilience
Fisheries	Netting	Abrasion/Physical disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Loss of erect habitat-forming species. Change in community structure. Pulse impact of medium intensity and localized extent. High persistence and low resilience
Recreation	Angling	Abrasion/Physical disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in surface community structure. Pulse impact of low intensity and localized extent. Low persistence and high resilience
Recreation	Angling	Abrasion/Physical disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Loss of erect habitat-forming species. Change in community structure. Pulse impact of low to medium intensity (depending of the

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				focused taxa) and localized extent. Low to medium persistence and medium resilience
Recreation	Angling	Abrasion/Physical disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Loss of erect habitat-forming species. Change in community structure. Pulse impact of medium intensity and localized extent. High persistence and low resilience
Recreation	Boating/yatching	Abrasion/Physical disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Virtually absent in deep bottoms
Recreation	Boating/yatching	Abrasion/Physical disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Virtually absent in deep bottoms
Recreation	Boating/yatching	Abrasion/Physical disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Virtually absent in deep bottoms
Recreation	Diving/dive site	Abrasion/Physical disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in surface community structure. Pulse impact of low intensity and localized extent. Low persistence and high resilience
Recreation	Diving/dive site	Abrasion/Physical disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47,	Loss of erect habitat-forming species. Change in community structure. Pulse impact of low to

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			A6.31 and A6.513	medium intensity (depending of the focused taxa) and localized extent. Low to medium persistence and medium resilience
Recreation	Diving/dive site	Abrasion/Physical disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Loss of erect habitat-forming species. Change in community structure. Pulse impact of medium intensity and localized extent, but can be locally heavy in intensity. High persistence and low resilience
Uses	Archaeology	Abrasion/Physical disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Loss of substrate. Change in community structure. Pulse impact of high intensity and localized extent. Medium persistence and high resilience
Uses	Archaeology	Abrasion/Physical disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Loss of substrate. Change in community structure. Pulse impact of high intensity and localized extent. Medium persistence and medium resilience
Uses	Archaeology	Abrasion/Physical disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Loss of substrate. Change in community structure. Pulse impact of high intensity and localized extent. High persistence and low resilience

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
Uses	Military	Abrasion/Physical disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Unknown
Uses	Military	Abrasion/Physical disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Unknown
Uses	Military	Abrasion/Physical disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Unknown
Uses	Mooring/beaching	Abrasion/Physical disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in surface community structure. Pulse impact of low intensity and localized extent. Low persistence and high resilience
Uses	Mooring/beaching	Abrasion/Physical disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of low to medium intensity (depending of the focused taxa) and localized extent. Low to medium persistence and medium resilience
Uses	Mooring/beaching	Abrasion/Physical disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Loss of erect habitat-forming species. Change in community structure. Pulse impact of high intensity and localized extent, but can be locally heavy in intensity.

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				High persistence and low resilience
Uses	Research	Abrasion/Physical disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of low intensity and localized extent. Low persistence and high resilience
Uses	Research	Abrasion/Physical disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of low intensity and localized extent. Low persistence and medium resilience
Uses	Research	Abrasion/Physical disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Pulse impact of high intensity and localized extent. Medium persistence and low resilience
Uses	Shipping	Abrasion/Physical disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Pulse impact of variable intensity in shallow waters (port facilities and neighbourhoods) and localized extent. Low persistence and high resilience
Uses	Shipping	Abrasion/Physical disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Pulse impact of variable intensity in shallow waters (port facilities and neighbourhoods)

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				and localized extent. Low persistence and medium resilience
Uses	Shipping	Abrasion/Physical disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Pulse impact of variable intensity in shallow waters (port facilities and neighbourhoods) and localized extent. Medium persistence and low resilience
Wastes	Brine discharges	Abrasion/Physical disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Potential fisiological stress to many organisms. Probable changes in community structure. Press (chronic) impact of variable intensity and large extent. Effects and persistence largely unknown. High expected resilience
Wastes	Brine discharges	Abrasion/Physical disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Potential fisiological stress to many organisms. Probable changes in community structure. Press (chronic) impact of variable intensity and large extent. Effects and persistence largely unknown. Medium expected resilience
Wastes	Brine discharges	Abrasion/Physical disturbance	Predominant habitat types (benthic coralligenous	Potential fisiological stress to many organisms.

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			biocenosis): A5.51 and A6.61	Probable changes in community structure. Press (chronic) impact of variable intensity and large extent. Effects and persistence largely unknown. Low expected resilience
Climate change	Current change	Displacement	Predominant habitat types (benthic muddy biocenosis): A5.39	Possible decoupling between pelagic and benthic foods webs. Changes in colonization rates by current-borned exotic species. Expected changes in the structure of communities. Press (chronic) impact of low intensity and large extent. High persistence and low or null resilience
Climate change	Current change	Displacement	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Possible decoupling between pelagic and benthic foods webs. Changes in colonization rates by current-borned exotic species. Expected changes in the structure of communities. Press (chronic) impact of low intensity and large extent. High persistence and low or null resilience
Climate change	Current change	Displacement	Predominant habitat types (benthic	Possible decoupling between pelagic

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			coralligenous biocenosis): A5.51 and A6.61	and benthic foods webs. Changes in colonization rates by current-borned exotic species. Expected changes in the structure of communities. Press (chronic) impact of low intensity and large extent. High persistence and low or null resilience
Development	Construction phase	Displacement	Predominant habitat types (benthic muddy biocenosis): A5.39	Habitat modificiation. Changes in community structure. Pulse impact of high intensity and localized extent. Medium persistence and medium resilience
Development	Construction phase	Displacement	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Habitat modificiation. Changes in community structure. Pulse impact of high intensity and localized extent. Medium persistence and medium resilience
Development	Construction phase	Displacement	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Habitat modificiation. Changes in community structure. Pulse impact of high intensity and localized extent. High persistence and low resilience
Fisheries	Benthic trawls	Displacement	Predominant habitat types	Habitat modificiation.

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			(benthic muddy biocenosis): A5.39	Changes in community structure. Pulse impact of high intensity and localized extent. Low persistence and high resilience
Fisheries	Benthic trawls	Displacement	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Habitat modification and loss of erect species. Changes in community structure. Pulse impact of high intensity and localized extent. Medium persistence and medium resilience
Fisheries	Benthic trawls	Displacement	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Habitat loss. Changes in community structure. Pulse impact of high intensity and localized extent. High persistence and low resilience
Fisheries	Netting	Displacement	Predominant habitat types (benthic muddy biocenosis): A5.39	Surface habitat modification. Changes in community structure. Pulse impact of low intensity and localized extent. Low persistence and high resilience
Fisheries	Netting	Displacement	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Surface habitat modification and loss of erect species. Changes in community structure. Pulse impact of medium intensity and localized extent. Medium

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				persistence and medium resilience
Fisheries	Netting	Displacement	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Habitat loss. Changes in community structure. Pulse impact of high intensity and localized extent. High persistence and low resilience
Recreation	Angling	Displacement	Predominant habitat types (benthic muddy biocenosis): A5.39	Surface habitat modificiation. Changes in community structure. Pulse impact of low intensity and localized extent. Low persistence and high resilience
Recreation	Angling	Displacement	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Surface habitat modificiation and loss of erect species. Changes in community structure. Pulse impact of low intensity and localized extent. Medium persistence and medium to high resilience
Recreation	Angling	Displacement	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Loss of erect habitat-forming species. Changes in community structure. Pulse impact of high intensity and localized extent. High persistence and low resilience
Recreation	Diving/dive site	Displacement	Predominant habitat types (benthic muddy biocenosis): A5.39	Surface habitat modificiation. Changes in community structure. Pulse

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				impact of low intensity and localized extent. Low persistence and high resilience
Recreation	Diving/dive site	Displacement	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Surface habitat modificiation and loss of erect species. Changes in community structure. Pulse impact of low intensity and localized extent. Medium persistence and medium to high resilience
Recreation	Diving/dive site	Displacement	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Loss of erect habitat-forming species. Changes in community structure. Pulse impact of high intensity and localized extent. High persistence and low resilience
Uses	Archaeology	Displacement	Predominant habitat types (benthic muddy biocenosis): A5.39	Loss of substrate. Changes in community structure. Pulse impact of high intensity and localized extent. Medium to low persistence and high resilience
Uses	Archaeology	Displacement	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Loss of substrate and erect species. Changes in community structure. Pulse impact of high intensity and localized extent. Medium persistence and medium to high

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				resilience
Uses	Archaeology	Displacement	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Loss of substrate and habitat-forming species. Changes in community structure. Pulse impact of high intensity and localized extent. High persistence and low or no resilience
Uses	Mooring/beaching	Displacement	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in community structure. Pulse impact of medium intensity and localized extent. Low persistence and high resilience
Uses	Mooring/beaching	Displacement	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in community structure. Pulse impact of medium intensity and localized extent. Medium persistence and medium to high resilience
Uses	Mooring/beaching	Displacement	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in community structure. Pulse impact of high intensity and localized extent. High persistence and low or no resilience
Uses	Research	Displacement	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in community structure. Pulse impact of medium intensity and localized extent. Low persistence and high resilience
Uses	Research	Displacement	Predominant	Changes in

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	community structure. Pulse impact of medium intensity and localized extent. Medium persistence and medium to high resilience
Uses	Research	Displacement	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in community structure. Pulse impact of high intensity and localized extent. High persistence and low or no resilience
Uses	Shipping	Displacement	Predominant habitat types (benthic muddy biocenosis): A5.39	Displacement of pelagic propagules as ballast water and fouling organisms onto the hulls. Change in community structure. Press (chronic) impact of low intensity and large extent. In few cases the impact reaches high persistence and low resilience
Uses	Shipping	Displacement	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Displacement of pelagic propagules as ballast water and fouling organisms onto the hulls. Change in community structure. Press (chronic) impact of low intensity and large extent. In few cases the impact reaches high persistence and low resilience
Uses	Shipping	Displacement	Predominant	Displacement of

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	pelagic propagules as ballast water and fouling organisms onto the hulls. Change in community structure. Press (chronic) impact of low intensity and large extent. In few cases the impact reaches high persistence and low resilience
Development	Construction phase	Hydrocarbon contamination	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation.
Development	Construction phase	Hydrocarbon contamination	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Development	Construction phase	Hydrocarbon contamination	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				fractionation
Development	Oil and gas platforms	Hydrocarbon contamination	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Development	Oil and gas platforms	Hydrocarbon contamination	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Development	Oil and gas platforms	Hydrocarbon contamination	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Extraction	Oil & gas	Hydrocarbon contamination	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
Extraction	Oil & gas	Hydrocarbon contamination	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Extraction	Oil & gas	Hydrocarbon contamination	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Fisheries	Benthic trawls	Hydrocarbon contamination	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Fisheries	Benthic trawls	Hydrocarbon contamination	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Fisheries	Benthic trawls	Hydrocarbon	Predominant	Change in

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
		contamination	habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Fisheries	Netting	Hydrocarbon contamination	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Fisheries	Netting	Hydrocarbon contamination	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Fisheries	Netting	Hydrocarbon contamination	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Recreation	Angling	Hydrocarbon contamination	Predominant habitat types	Change in community

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			(benthic muddy biocenosis): A5.39	structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Recreation	Angling	Hydrocarbon contamination	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Recreation	Angling	Hydrocarbon contamination	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Recreation	Boating/yatching	Hydrocarbon contamination	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Recreation	Boating/yatching	Hydrocarbon contamination	Predominant habitat types (benthic detritic	Change in community structure. Press

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	(chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Recreation	Boating/yatching	Hydrocarbon contamination	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Recreation	Diving/dive site	Hydrocarbon contamination	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Recreation	Diving/dive site	Hydrocarbon contamination	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Recreation	Diving/dive site	Hydrocarbon contamination	Predominant habitat types (benthic coralligenous	Change in community structure. Press (chronic) impact

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			biocenosis): A5.51 and A6.61	from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Uses	Archaeology	Hydrocarbon contamination	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Uses	Archaeology	Hydrocarbon contamination	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Uses	Archaeology	Hydrocarbon contamination	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Uses	Military	Hydrocarbon contamination	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact from leaking,

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Uses	Military	Hydrocarbon contamination	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Uses	Military	Hydrocarbon contamination	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Uses	Mooring/beaching	Hydrocarbon contamination	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Uses	Mooring/beaching	Hydrocarbon contamination	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47,	Change in community structure. Press (chronic) impact from leaking, usually diffuse and

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
			A6.31 and A6.513	of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Uses	Mooring/beaching	Hydrocarbon contamination	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Uses	Research	Hydrocarbon contamination	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Uses	Research	Hydrocarbon contamination	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Uses	Research	Hydrocarbon contamination	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent.

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				Variable toxicity and persistence on depending of the oil origin and fractionation
Uses	Shipping	Hydrocarbon contamination	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Uses	Shipping	Hydrocarbon contamination	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Uses	Shipping	Hydrocarbon contamination	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Wastes	Shipping wastes	Hydrocarbon contamination	Predominant habitat types (benthic muddy biocenosis): A5.39	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				and persistence on depending of the oil origin and fractionation
Wastes	Shipping wastes	Hydrocarbon contamination	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Wastes	Shipping wastes	Hydrocarbon contamination	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Change in community structure. Press (chronic) impact from leaking, usually diffuse and of large extent. Variable toxicity and persistence on depending of the oil origin and fractionation
Fisheries	Benthic trawls	Selective extraction of target species	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in community structure. Press (chronic) impact of high intensity and large extent through direct and indirect cascading effects of the removal of targeted top predators. Medium persistence and medium resilience, but in some cases can lead to the fuctional extinction of collapsed populations

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
Fisheries	Benthic trawls	Selective extraction of target species	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in community structure. Press (chronic) impact of high intensity and large extent through direct and indirect cascading effects of the removal of targeted top predators. Medium persistence and medium resilience, but in some cases can lead to the fuctional extinction of collapsed populations
Fisheries	Benthic trawls	Selective extraction of target species	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in community structure. Press (chronic) impact of high intensity and large extent through direct and indirect cascading effects of the removal of targeted top predators. Medium persistence and medium resilience, but in some cases can lead to the fuctional extinction of collapsed populations
Fisheries	Netting	Selective extraction of target species	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in community structure. Press (chronic) impact of high intensity and large extent

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				through direct and indirect cascading effects of the removal of targeted top predators. Medium persistence and medium resilience, but in some cases can lead to the fuctional extinction of collapsed populations
Fisheries	Netting	Selective extraction of target species	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in community structure. Press (chronic) impact of high intensity and large extent through direct and indirect cascading effects of the removal of targeted top predators. Medium persistence and medium resilience, but in some cases can lead to the fuctional extinction of collapsed populations
Fisheries	Netting	Selective extraction of target species	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in community structure. Press (chronic) impact of high intensity and large extent through direct and indirect cascading effects of the removal of targeted top predators. Medium

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				persistence and medium resilience, but in some cases can lead to the fuctional extinction of collapsed populations
Recreation	Angling	Selective extraction of target species	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in community structure. Press (chronic) impact of largely unknown intensity and large extent through direct and indirect cascading effects of the removal of targeted top predators. Medium persistence and medium resilience, but in some cases can selectively remove the largest reproductive individuals
Recreation	Angling	Selective extraction of target species	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in community structure. Press (chronic) impact of largely unknown intensity and large extent through direct and indirect cascading effects of the removal of targeted top predators. Medium persistence and medium resilience, but in some cases can selectively remove the largest reproductive individuals
Recreation	Angling	Selective	Predominant	Changes in

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
		extraction of target species	habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	community structure. Press (chronic) impact of largely unknown intensity and large extent through direct and indirect cascading effects of the removal of targeted top predators. Medium persistence and medium resilience, but in some cases can selectively remove the largest reproductive individuals
Recreation	Diving/dive site	Selective extraction of target species	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in community structure. Pulse impact of low intensity and localized extent in this biocenosis. Medium persistence and medium resilience, but in some cases can significantly decrease abundance of sensible species
Recreation	Diving/dive site	Selective extraction of target species	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in community structure. Pulse impact of low intensity and localized extent in this biocenosis. Medium persistence and medium resilience, but in some cases can significantly decrease abundance of sensible species

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
Recreation	Diving/dive site	Selective extraction of target species	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in community structure. Pulse impact of largely unknown intensity and localized extent in this biocenosis. Medium persistence and medium resilience, but in some cases can significantly decrease abundance of sensible species like gorgonians, corals and large bivalves
Uses	Research	Selective extraction of target species	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in community structure. Pulse impact of low intensity and localized extent. low persistence and high resilience
Uses	Research	Selective extraction of target species	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in community structure. Pulse impact of low intensity and localized extent. low persistence and high resilience
Uses	Research	Selective extraction of target species	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in community structure. Pulse impact of low intensity and localized extent. low persistence and high resilience
Fisheries	Benthic trawls	Selective extraction of non-target species	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in community structure. Press (chronic) impact of high intensity and large extent

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				through direct mortality and altered interactions and their strenghts. Medium persistence and medium resilience, but in some cases can lead to deep functional changes in the size spectra and trophic relevance of non-target species
Fisheries	Benthic trawls	Selective extraction of non-target species	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in community structure. Press (chronic) impact of high intensity and large extent through direct mortality and altered interactions and their strenghts. Medium persistence and medium resilience, but in some cases can lead to deep functional changes in the size spectra and trophic relevance of non-target species
Fisheries	Benthic trawls	Selective extraction of non-target species	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in community structure. Press (chronic) impact of high intensity and large extent through direct mortality and altered interactions and their strenghts. Medium persistence and

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				medium resilience, but in some cases can lead to deep functional changes in the size spectra and trophic relevance of non-target species
Fisheries	Netting	Selective extraction of non-target species	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in community structure. Press (chronic) impact of high intensity and large extent through direct mortality and altered interactions and their strenghts. Medium persistence and medium resilience, but in some cases can lead to deep functional changes in the size spectra and trophic relevance of non-target species
Fisheries	Netting	Selective extraction of non-target species	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in community structure. Press (chronic) impact of high intensity and large extent through direct mortality and altered interactions and their strenghts. Medium persistence and medium resilience, but in some cases can lead to deep functional changes in the size spectra and trophic relevance of non-

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				target species
Fisheries	Netting	Selective extraction of non-target species	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in community structure. Press (chronic) impact of high intensity and large extent through direct mortality and altered interactions and their strenghts. Medium persistence and medium resilience, but in some cases can lead to deep functional changes in the size spectra and trophic relevance of non-target species
Recreation	Angling	Selective extraction of non-target species	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in community structure. Pulse impact of largely largely unknown intensity and potentially large extent. Medium persistence and medium resilience, but in some cases can lead to strong functional effects
Recreation	Angling	Selective extraction of non-target species	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in community structure. Pulse impact of largely largely unknown intensity and potentially large extent. Medium persistence and medium resilience, but in some cases can lead to strong functional effects
Recreation	Angling	Selective	Predominant	Changes in

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
		extraction of non-target species	habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	community structure. Pulse impact of largely largely unknown intensity and potentially large extent. Medium persistence and medium resilience, but in some cases can lead to strong functional effects
Uses	Archaeology	Selective extraction of non-target species	Predominant habitat types (benthic muddy biocenosis): A5.39	Loss of the pristine community. Pulse impact of high intensity and localized extent. Low persistence and high resilience
Uses	Archaeology	Selective extraction of non-target species	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Loss of the pristine community. Pulse impact of high intensity and localized extent. Medium to low persistence and medium to high resilience
Uses	Archaeology	Selective extraction of non-target species	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Loss of the pristine community. Pulse impact of high intensity and localized extent. High persistence and low or no resilience
Uses	Military	Selective extraction of non-target species	Predominant habitat types (benthic muddy biocenosis): A5.39	Unknown
Uses	Military	Selective extraction of non-target species	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Unknown

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
Uses	Military	Selective extraction of non-target species	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Unknown
Uses	Research	Selective extraction of non-target species	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in community structure. Pulse impact of low intensity and localized extent. low persistence and high resilience
Uses	Research	Selective extraction of non-target species	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in community structure. Pulse impact of low intensity and localized extent. low persistence and high resilience
Uses	Research	Selective extraction of non-target species	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in community structure. Pulse impact of low intensity and localized extent. low persistence and high resilience
Uses	Mooring/beaching/coastal and off-shore facilities	Light disturbance	Predominant habitat types (benthic muddy biocenosis): A5.39	Changes in the behaviour of certain species; extended foraging times of visual predators; concentration of certain species. Community effects unknown
Uses	Mooring/beaching/coastal and off-shore facilities	Light disturbance	Predominant habitat types (benthic detritic and sandy biocenosis): A5.46, A5.47, A6.31 and A6.513	Changes in the behaviour of certain species; extended foraging times of visual predators; concentration of certain species. Community effects

Sector	Activity	Pressure	Relevant natural ecosystem component	Impact (adverse affects). Persistence and resilience
				unknown
Uses	Mooring/beaching/coastal and off-shore facilities	Light disturbance	Predominant habitat types (benthic coralligenous biocenosis): A5.51 and A6.61	Changes in the behaviour of certain species; extended foraging times of visual predators; concentration of certain species. Community effects unknown

First generic pressure maps need to be produced in GIS accounting for the footprint and intensity of the human activities. The footprint of an activity is the actual area affected by the activity.

Good information

First, collate GIS maps for all activities in vector format. For all human activities the footprint and intensity in relation to the spatial and temporal scales of the assessment should be determined. For instance cables and pipelines can be associated with a certain width, or a demersal fishing track creates a certain footprint on the seabed. Using the standard buffer tool in GIS, convert line and points maps which reflect the footprint and intensity of the human activities to polygons.

Using the information in table 2b.2.1 identify which activities exert the same generic pressure on the natural ecosystem components. GIS layers for these activities should be merged into single pressure layers. A vector grid with an adequate cell size reflecting a good compromise between the spatial resolution of the data used and the scale of the SMA should be superimposed onto the merged activities layer. This allows us to summarise the proportion of each grid cell affected by the footprint and/ or intensity of all the human activities exerting the same pressure and to produce respective pressure maps. Fill out table 2b.2.2 to summarise these pressure, activities and the proportion of the SMA affected.

Table 2b.2.2

Pressure	Activities which contribute to that pressure	Proportion of SMA affected by pressure (P)
Substratum loss	Dock/port facilities, benthic trawls, archaeology.	0.06%
Smothering	Artificial reefs, communication cables, dock/port facilities, marinas, oil and gas platform, benthic trawls, potting/creeling, archaeology, mooring, fishery and agriculture wastes, sewage discharge, shipping wastes, spoil dumping	0.9%
Suspended sediment	Fin-fish, artificial reefs, communication cables, dock/port facilities, marinas, oil and gas	1.2%

	platform, power station, benthic trawls, archaeology, mooring, shipping, fishery and agriculture wastes, sewage discharge, shipping wastes, spoil dumping	
Changes in water flow rate	Artificial reefs, communication cables, dock/port facilities, marinas, oil and gas platform, mooring.	
Changes in temperature	Dock/port facilities, marinas, power station,	
Changes in turbidity	Artificial reefs, dock/port facilities, marinas, oil and gas platform, power station, benthic trawls, archaeology, mooring, shipping, fishery and agriculture wastes, sewage discharge, shipping wastes, spoil dumping	
Changes in wave exposure	Dock/port facilities, marinas?	
Noise disturbance	Fin-fish, dock/port facilities, marinas, oil and gas platform, power station, benthic trawls, netting, pelagic trawls, potting, dive sites, archaeology, mooring, shipping	
Visual presence	Fin-fish, communication cables, dock/port facilities, marinas, oil and gas platform, power station, benthic trawls, netting, pelagic trawls, potting, dive sites? Archaeology, mooring, shipping, sewage discharge, shipping wastes, spoil dumping	
Abrasion / physical disturbance	Dock/port facilities, marinas, oil and gas platform, benthic trawls, netting, potting/creeling, archaeology, mooring, shipping	
Displacement	Dock/port facilities, marinas?	
Synthetic compound contamination	Fin-fish, artificial reefs, communication cables?, dock/port facilities, marinas, oil and gas platform, power station, benthic trawls?, archaeology, mooring, shipping, sewage discharge, shipping wastes, spoil dumping,	
Heavy metal contamination	Artificial reefs, dock/port facilities, marinas, oil and gas platform, power station, benthic trawls, mooring, shipping, sewage discharge, shipping wastes, spoil dumping	
Hydrocarbon contamination	Artificial reefs, dock/port	

	facilities, marinas, oil and gas platform, power station, benthic trawls, archaeology, mooring, shipping, sewage discharge, shipping wastes, spoil dumping	
Changes in nutrient levels	Fin-fish, artificial reefs, dock/port facilities, marinas, oil and gas platform, power station, benthic trawls, archaeology, sewage discharge, shipping wastes, spoil dumping	
Changes in salinity	dock/port facilities, power station,	
Changes in oxygenation	Artificial reefs, dock/port facilities, marinas, power station, archaeology, shipping, sewage discharge, shipping wastes, spoil dumping	
Introduction of microbial pathogens/parasites	dock/port facilities, marinas, mooring, shipping, shipping wastes,	
Introduction of non-native species	dock/port facilities, marinas, mooring, shipping, shipping wastes,	
Selective extraction of target species	benthic trawls, netting, pelagic trawls, potting/creeling	
Selective extraction of non-target species	benthic trawls, netting, pelagic trawls, potting/creeling	

Create a GIS raster layer of the pressures where the value in each cell is the proportion of grid cell affected by the pressure (P).

Next the sensitivity of each ecosystem component to the human pressure should be determined. The measure of sensitivity should account for the resistance and resilience and there are many examples in the literature for determining this. As an example the MarLIN sensitivity rationale (http://www.marlin.ac.uk/sensitivityrationale.php) uses intolerance and recoverability and combines these as shown in table 2b.2.3 to define sensitivity. MarLIN also provides an online database of habitat and species sensitivity values to the range of pressures listed in table 2b.1.1.

Table 2b.2.3: Combining 'intolerance' and 'recoverability' assessments to determine 'sensitivity'. NS = not sensitive, NR = not relevant taken from http://www.marlin.ac.uk/sensitivityrationale.php

		Recoverability						
		None	Very low (>25 yr.)	Low (>10/25 yr.)	Moderate (>5 -10 yr.)	High (1 -5 yr.)	Very high (<1 yr.)	Immediate (< 1 week)
Intolerance	High	Very high	Very high	High	Moderate	Moderate	Low	Very low
	Intermediate	Very high	High	High	Moderate	Low	Low	Very Low
	Low	High	Moderate	Moderate	Low	Low	Very Low	NS

	Tolerant	NS	NS	NS	NS	NS	NS	NS
	Tolerant*	NS*	NS*	NS*	NS*	NS*	NS*	NS*
	Not relevant	NR	NR	NR	NR	NR	NR	NR

This measure of sensitivity should be outlined in detail and summarised in table 2b.2.4 by listing natural ecosystem components along the column headings and the human pressures along the row headings and filling in the sensitivity information for each ecosystem component on each pressure.

Table 2b.2.4

		Ecosystem components					
Human pressures		Bathymetry of the seabed	Predominant habitat types	Special habitat types	Biological communities including phytoplankton and zooplankton	Fish population	Protected species
	Substratum loss	No	high	high	medium	low	low
	Smothering	low	Medium	high	Low	low	low
	Suspended sediment	no	Low	low	medium	medium	medium
	Changes in water flow rate	no	medium	medium	Medium	Medium	medium
	Changes in temperature	no	high	high	Medium	medium	medium
	Changes in turbidity	no	low	medium	high	High	High
	Changes in wave exposure	no	medium	medium	medium	medium	Medium
	Noise disturbance	no	no	no	low	medium	Medium
	Visual presence	no	no	no	low	medium	Medium
	Abrasion / physical disturbance	medium	high	high	low	medium	Medium
	Displacement	low	high	high	low	medium	Medium
	Synthetic compound contamination	no	High	High	High	Medium	medium
	Heavy metal metal contamination	no	high	high	medium	high	high
	Hydro carbon contamination	no	high	high	medium	high	high
	Changes in nutrient levels	no	low	medium	medium	high	high
	Changes in	no	medium	mediu	medium	High	High

salinity			m			
Changes in oxygenation	no	medium	mediu m	medium	High	High
Introduction of microbial pathogens parasites	no	medium	mediu m	medium	High	High
Introduction of non-native species	no	low	mediu m	high	High	High
Selective extraction of target species	no	medium	mediu m	Medium	Mediu m	Medium
Selective extraction of non – target species	no	medium	mediu m	medium	medium	medium

To map the impact of those pressures the measure of sensitivity needs to be converted from an ordinate scale to a numeric measure for sensitivity. The values are as follows: 0 (no), 0.2 (low), 0.6 (medium), and 1 (high). Create a GIS raster layer of sensitivity information for ecosystem components where the sensitivity (S) for each raster cell is the numeric measure above for each of the sensitivities listed in table 2b.2.4.

N.B.: Actually, we are further working this approach in order to make use of continuous, interpolated data on pressure intensity, rather than their spatial extent. This would allow to use of a wider array of available data in the CS area.

To create a pressure impact layer the impact of a given pressure for each raster cell can be computed as:

$$I_i = P_i \cdot S_{ij}$$

With P_i as the measure a pressure (i = 1, 2,…n) and S the sensitivity measure j (j = 1, 2,…m) of a component for the given pressure P_i.

Intermediate information

Similar to good data, in cases where the geodata of human activities have been generated with expert knowledge, the activity data should be merged by the generic pressure categories. A vector grid with an adequate cell size reflecting a good comprise between the spatial resolution of the data used and the scale of the SMA should be superimposed onto the merged activities layer. This allows to summarise the proportion of a grid cell affected by the footprint and/ or intensity of all the human activities exerting the same pressure and to produce respective pressure maps.

The sensitivity of each ecosystem component to the human pressure categories should be determined and summarised in table 2b.2.5. This may be limited to expert judgement.

Table 2b.2.5

		Ecosystem components		
Human pressures				

To map the impact of those pressures the measure of sensitivity needs to be converted from an ordinate scale to a numeric measure for sensitivity. The values are as follows: 0 (no), 0.2 (low), 0.6 (medium), and 1 (high). Create a GIS raster layer of sensitivity information for ecosystem components where the sensitivity (S) for each raster cell is the numeric measure above for each of the sensitivities listed in table 2b.2.4.
To create an pressure impact layer the impact of a given pressure for each raster cell can be computed as:

$$I_i = P_i \cdot S_{ij}$$

With P_i as the measure a pressure (i = 1, 2,…n) and S the sensitivity measure j (j = 1, 2,…m) of a component for the given pressure P_i.

No information

Based on table 2b.2.3 and the example of MarLIN sensitivity rationale a measure of sensitivity of each component to the respective pressure categories should be summarised on a qualitative basis in 2b.2.6.

Table 2b.2.6

		Ecosystem components		
Human pressures				

Step 2c: Identify existing management measures

The aim of this step is to identify the implemented and/or proposed management measures. The information collected during the actions in step 1b, where the goals and operational objectives for SMA are established, will be used. The effectiveness of any management measures taken is partly dependent on how well the management measures take into account and answer to the desired operational objectives. In successful and efficient management it is therefore of prime importance to match the implemented or proposed management measures as exactly as possible to operational objectives. Management measures range from, for instance, national laws and policies to implement the Habitats Directive, through to codes of conduct that guide the activities of particular users in the SMA. The key focus of the review of existing management measures should be those related to the goal/objective of the SMA, including their links to and influence over other sectoral laws/policies. However, other sectoral laws/policies need not be reviewed in themselves, other than in so far as how they are related to the laws/policies concerning the goal/objective. Further guidance on which existing management measures should be reviewed in relation to the case study goal/objective will be developed in relation to each case study via the governance research analysis. The outcome of this step will be a list of the existing or proposed management measures related to the operational objectives in step 1b. This list feeds directly into step 7 where the necessity for the adaptation of the current management will be considered. Step 2c links to the governance analysis. An initial task under WP6 will be to collate information on the existing management measures in relation to the related objectives on which the study is focused.

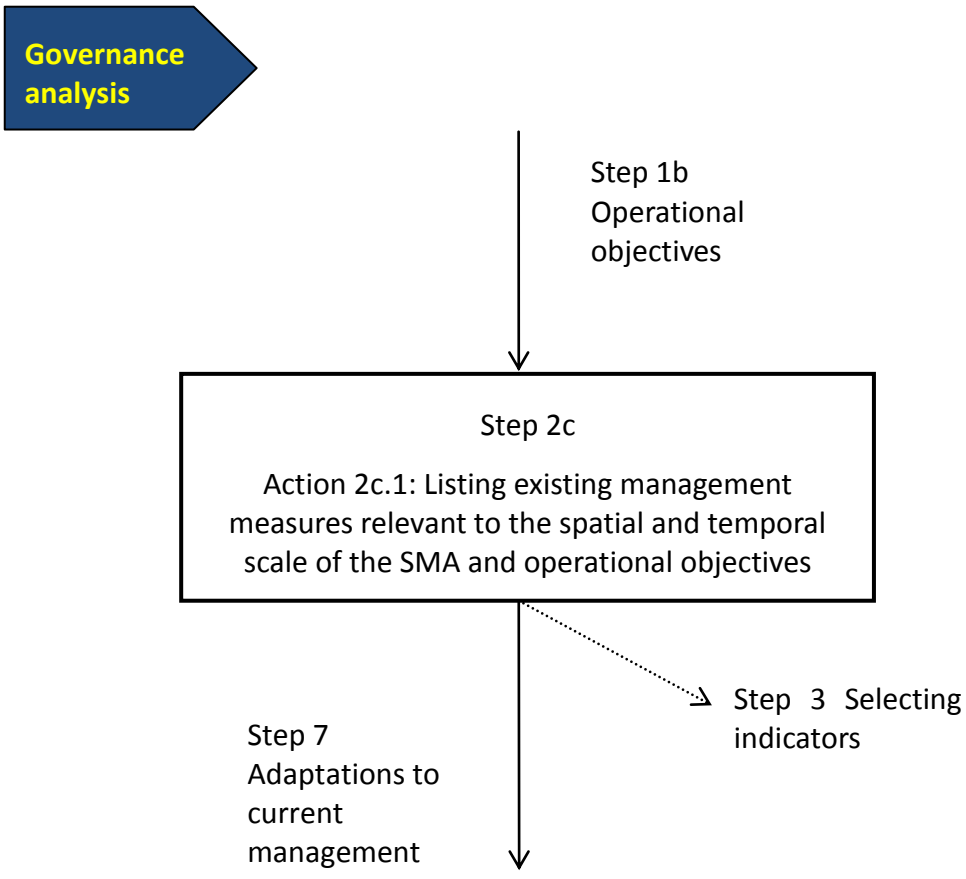


Figure 2c.1: Work flow for step 2c. See also the governance analysis for further visualisation of step 2c.

Action 2c.1: Using data collected in step 1b list the existing management measures relevant to the spatial and temporal scale of SMA and the operational objectives

Generally, management measures can be grouped according to:

- Economic measures
- Interpretative measures
- Knowledge measures
- Legal measures
- Participative measures

However, since management measures are largely controlled through governance this will be dealt with through the governance analysis undertaken by WP6.

Step 3: Selecting indicators and thresholds

The previous steps produced the spatial and temporal boundaries (step 1a) for the assessment and defined a suit of operational objectives (step 1b) balanced between the number of environmental and socio-economic objectives. The selected objectives have been related to the relevant ecosystem components (step 2a) and the spatial overlap between those components and the spatio-temporal distribution pattern of human pressures has been assessed (step 2b). The aim of this step is to guide through a standardised process on how to select indicators and respective thresholds in relation to the operational objectives specified in step 1b and the relevant ecosystem components identified in step 2b. The guidance comprises how to assess the appropriateness of the indicators (viability analysis) and to report on both the rationale for selecting thresholds or using trends and gaps in data availability. The output of this step is a list of indicators suitable to assess an existing marine spatial management plan or an envisioned spatial management scenario. The actual assessment of the state of the indicators in relation to human pressures will be conducted in step 4 (see Figure 3.1).

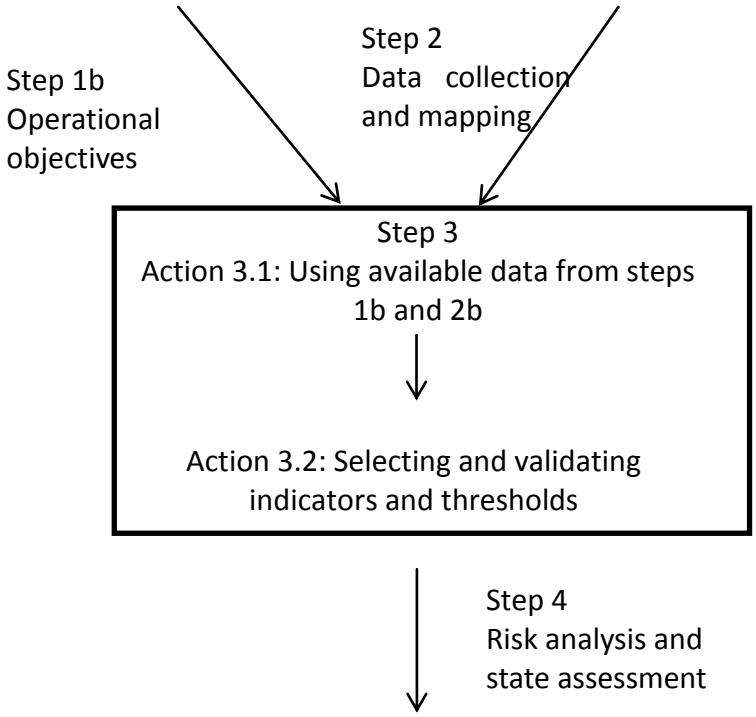


Figure 3.1: Work flow diagram for step 3

Action 3.1: Using available data from steps 1b and 2b

For each operational objective defined in step 1b identify the relevant environmental and socio-economic components (step 2a) and compile information on the availability of relevant data. Using this information fill out table 3.1 for each operational objective:

Table 3.1

Operational objective	Environmental or socio-economic component	Quality of available data			Description /Source /Accessibility
		Good	Intermediate	Poor/no data	
Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013	Environmental Socio-econiomic		x		
Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020	Environmental			x	
Sustainable exploitation of natural					

resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date					
Financial viability and safe working conditions for fishermen by 2013	Socio-economic	x			
Preservation of specific issues regarding the cultural heritage (say artisanal fisheries) within a given date	Socio-economic		x		

Action 3.2: Selecting and validating indicators

The indicators will be chosen to facilitate tracking whether the operational objectives set for the specific SMA are met.

An extensive knowledgebase on indicators exists already and has been partly collated within WP1 of MESMA. In the following some example sources are listed: In the European Seas a global objective is the Good Environmental Status, as described in the Marine Strategy FD (2008/56/EC) and the Commission Decision 2010/477/EU. The MSFD (Annex I) proposes 11 descriptors of the GES (Biological diversity, Alien species, Commercial Fish, Food webs, Eutrophication, Sea floor integrity, Hydrography, Contaminants, Contaminants in food, Marine litter, Energy including noise) that cover the most common components relevant for likely operational objectives. Several task groups developed a suit of 83 indicators (see D2.1) for those descriptors (2010/477/EU). Some of those indicators are already elaborated for the needs of the Water FD (2000/60/EC), published and tested in the Inter-calibration process. Some others are in preparation and the complete set of indicators for the 11 descriptors will be ready by 2015. Another

source of indicators is the Handbook for Measuring the Progress and Outcomes of Integrated Coastal and Ocean Management, 2006, UNESCO. Practical experience from the implementation of integrated coastal zone management (ICZM) produced an array of literature on relevant indicator selection (see e.g. Diedrich et al. 2010 and references therein). Like the implementations of ICZM there are a number of studies that aim to evaluate the effectiveness of marine protected areas (MPAs) using indicators. For further details on these and for the references used in this section please refer to D2.1.

Indicators (state and pressure indicators) should be viable from both a scientific and a management perspective. Thus for each of the selected candidate indicators conduct a viability analysis by scoring the indicators good (3), medium (2) or poor (1) using the set of criteria listed in table 3.2 (modified after ICES criteria for good indicators). One table should be filled out per candidate indicator.

Table 3.2 Indicators present in the different (sectoral) fisheries management plans in place in the Italian territory of the Strait of Sicily

[1] Instantaneous rate of total mortality (Z) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	1
Sensitive to manageable human activity	3
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	1
Responsive primarily to a human activity, with low responsiveness to other causes of change	1
Measurable over a large proportion of the area to which the indicator metric is to apply	1
Based on an existing body of time-series of data to allow a realistic setting of objectives	1
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	1
Sum	15

[2] Instantaneous rate of mortality by fishing (F) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	3
Sensitivity to change (change over time)	3
Relatively tightly linked in time to that activity	3
Easily and accurately measured with a low error rate	2
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator	2

metric is to apply	
Based on an existing body of time-series of data to allow a realistic setting of objectives	3
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	26

[3] Exploitation rate (E) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	3
Sensitivity to change (change over time)	3
Relatively tightly linked in time to that activity	3
Easily and accurately measured with a low error rate	2
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	2
Based on an existing body of time-series of data to allow a realistic setting of objectives	3
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	25

[4] Mean exploited spawning stock biomass / mean unexploited spawning stock biomass (ESSB/USSB) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	3
Sensitivity to change (change over time)	3
Relatively tightly linked in time to that activity	3
Easily and accurately measured with a low error rate	2
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	2
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	24

[5] Mean Catch Per Unit Effort (CPUE) (Kg)	Score (good=3; medium=2;

Criteria for viability analyses:	poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	3
Sensitivity to change (change over time)	3
Relatively tightly linked in time to that activity	3
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	3
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	3
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	30

[6] Total abundance [in the field] Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	2
Responsive primarily to a human activity, with low responsiveness to other causes of change	1
Measurable over a large proportion of the area to which the indicator metric is to apply	1
Based on an existing body of time-series of data to allow a realistic setting of objectives	1
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	19

[7] Total abundance of spawners [in the field] Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	2
Responsive primarily to a human activity, with low responsiveness to other causes of change	1
Measurable over a large proportion of the area to which the indicator metric is to apply	1
Based on an existing body of time-series of data to allow a realistic setting	1

of objectives	
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	19

[8] Total abundance of recruits [in the field] Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	1
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	1
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	18

[9] Total biomass [in the field] Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	2
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	1
Based on an existing body of time-series of data to allow a realistic setting of objectives	1
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	20

[10] Maximum sustainable yield (MSY) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	3

Sensitivity to change (change over time)	3
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	1
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	2
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	23

[11] Total construction of fishing vessels (KW) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	3
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	3
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	3
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	28

[12] Total construction of fishing vessels (GT) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	3
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	3
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	3
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or	3

expensive technological requirements)	
Sum	28

[13] Total upgrading of fishing vessels (KW) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	3
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	3
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	26

[13] Total upgrading of fishing vessels (GT) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	3
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	3
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	26

[15] Total catch (Tm) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	3
Sensitivity to change (change over time)	3
Relatively tightly linked in time to that activity	3
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other	3

causes of change	
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	3
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	30

[16] Mean catch by vessel (Tm) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	3
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	3
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	25

[17] Mean catch by day (Kg) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	3
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	3
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	25

[18] Mean gross profit by vessel (eur)	Score (good=3; medium=2;

Criteria for viability analyses:	poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	21

[19] Mean gross profit by worker Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	21

[20] Mean gross profit by revenue Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting	2

of objectives	
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	21

[21] Mean gross profit by invested capital Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	21

[22] Mean net profit by invested capital Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	22

[23] Mean net profit by revenue Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2

Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	22

[24] Mean revenue by fishing vessel Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	21

[25] Mean revenue by day (eur) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or	2

expensive technological requirements)	
Sum	21

[26] Mean price of product Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	2
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	21

[27] Mean added value by fishing vessel (eur) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	1
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	2
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	2
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	18

[28] Mean added value by worker (eur) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	1
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	2
Responsive primarily to a human activity, with low responsiveness to other	2

causes of change	
Measurable over a large proportion of the area to which the indicator metric is to apply	2
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	18

[29] Mean net profit by gross revenue Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	22

[30] Total invested capital (eur x 10^6) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	21

[31] Total gross profit (eur x 10^6)	Score (good=3; medium=2;

Criteria for viability analyses:	poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	21

[32] Total amortizations (eur x 10^6) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	1
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	1
Sum	19

[33] Total interests (eur x 10^6) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	1
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting	2

of objectives	
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	1
Sum	19

[34] Total net profit (eur x 10^6) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	22

[35] Total number of fishermen Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	3
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	3
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	22

[36] Total number of job positions Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2

Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	2
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	3
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	20

[37] Mean cost by worker Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	2
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	3
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	20

[38] Total production of fishing products (Tm x 10^3) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	3
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	3
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or	3

expensive technological requirements)	
Sum	27

[39] Total import of fishing products (Tm x 10^3) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	1
Sensitivity to change (change over time)	1
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	3
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	23

[40] Reduction of production cost (eur / vessel) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	24

[41] Increase of productivity (Tm / vessel) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other	2

causes of change	
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	3
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	26

[42] Increase of profit (eur / vessel) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	2
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	24

[43] Ratio of consumption of local products in the domestic market (total product / apparent consumption) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	2
Responsive primarily to a human activity, with low responsiveness to other causes of change	1
Measurable over a large proportion of the area to which the indicator metric is to apply	1
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	2
Sum	19

[44] Value of total production (eur x 10^6) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	3
Sensitivity to change (change over time)	3
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	2
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	2
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	25

[45] Number of collective actions Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	3
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	1
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	25

[46] Number of local management plans Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	3
Measurable over a large proportion of the area to which the indicator metric is to apply	3

Based on an existing body of time-series of data to allow a realistic setting of objectives	1
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	25

[47] Number of facilities Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	1
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	22

[48] Number of projects to enhance services to fishermen in ports Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	23

[49] Number of fishing vessels regarded Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3

Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	23

[50] Number of projects to develop markets Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	1
Sensitivity to change (change over time)	1
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	1
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	20

[51] [Number of] pilot projects (ARs, restocking) Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	1
Sensitivity to change (change over time)	1
Relatively tightly linked in time to that activity	1
Easily and accurately measured with a low error rate	3
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	3
Based on an existing body of time-series of data to allow a realistic setting of objectives	1
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	2

Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	20

[52] Number of production operators Criteria for viability analyses:	Score (good=3; medium=2; poor=1)
Relatively easy to understand by non-scientists and those who will decide on their use	3
Sensitive to manageable human activity	2
Sensitivity to change (change over time)	2
Relatively tightly linked in time to that activity	2
Easily and accurately measured with a low error rate	2
Responsive primarily to a human activity, with low responsiveness to other causes of change	2
Measurable over a large proportion of the area to which the indicator metric is to apply	2
Based on an existing body of time-series of data to allow a realistic setting of objectives	2
State of the development of the methodology to calculate the indicator (all formulas and measurements defined (3); more work needed (2); none (1))	3
Complexity of managing the indicator (high level of coordination or expensive technological requirements)	3
Sum	23

Insert the results of the individual indicator assessment in the following table and indicate if the respective indicator is selected for the subsequent analysis. From the final set of indicators, identify which are most important to evaluate the ecological status, pressures and impacts, and management measures in the SMA in question, in order to prioritise if resources are limited.

Table 3.3

Candidate indicator	Total Score	Selected (Y/N)
[1] Instantaneous rate of total mortality (Z)	15	Y
[2] Instantaneous rate of mortality by fishing (F)	26	Y
[3] Exploitation rate (E)	25	Y
[4] Mean exploited spawning stock biomass / mean unexploited spawning stock biomass (ESSB/USSB)	24	Y
[5] Mean Catch Per Unit Effort (CPUE) (Kg)	30	Y
[6] Total abundance	19	N
[7] Total abundance of spawners	19	N
[8] Total abundance of recruits	18	N
[9] Total biomass	20	N
[10] Maximum sustainable yield (MSY)	23	N
[11] Total construction of fishing vessels (KW)	28	N
[12] Total construction of fishing vessels (GT)	28	N
[13] Total upgrading of fishing vessels (KW)	26	N
[14] Total upgrading of fishing vessels (GT)	26	N
[15] Total catch (Tm)	30	Y
[16] Mean catch by vessel (Tm)	25	N
[17] Mean catch by day (Kg)	25	N
[18] Mean gross profit by vessel (eur)	21	N
[19] Mean gross profit by worker (eur)	21	N
[20] Mean gross profit by revenue	21	N
[21] Mean gross profit by invested capital	21	N
[22] Mean net profit by invested capital	22	N
[23] Mean net profit by revenue	22	N
[24] Mean revenue by fishing vessel	21	N
[25] Mean revenue by day (eur)	21	N
[26] Mean price of product	21	N
[27] Mean added value by fishing vessel (eur)	18	N
[28] Mean added value by worker (eur)	18	N
[29] Mean net profit by gross revenue	22	N
[30] Total invested capital (eur x 106)	21	N
[31] Total gross profit (eur x 106)	21	N
[32] Total amortizations (eur x 106)	19	N
[33] Total interests (eur x 106)	19	N
[34] Total net profit (eur x 106)	22	Y
[35] Total number of fishermen	22	Y
[36] Total number of job positions	20	N
[37] Mean cost by worker	20	N
[38] Total production of fishing products (Tm x 103)	27	Y
[39] Total import of fishing products (Tm x	23	N

103)		
[40] Reduction of production cost (eur / vessel)	24	N
[41] Increase of productivity (Tm / vessel)	26	N
[42] Increase of profit (eur / vessel)	24	N
[43] Ratio of consumption of local products in the domestic market (total product / apparent consumption)	19	N
[44] Value of total production (eur x 106)	25	N
[45] Number of collective actions	25	N
[46] Number of local management plans	25	Y
[47] Number of facilities	22	N
[48] Number of projects to enhance services to fishermen in ports	23	N
[49] Number of fishing vessels regarded [by those projects?]	23	N
[50] Number of projects to develop markets	20	N
[51] [Number of] pilot projects (ARs, restocking)	20	N
[52] Number of production operators	23	N

After having selected the most appropriate indicators for each goal/operational objective, fill in the following Table 3.4 to identify gaps in available data (separately for each goal/operational objective):

Table 3.4.1

Operational Objective: [Der1] Substantial reduction (say 20%) and rational spatial allocation of fishing effort by 2013

Indicator	Needed data	Availability		Remarks
		YES	NO	
[5] Mean Catch Per Unit Effort (CPUE) (Kg)	Catch biomass	Partial (some species)		Availability is limited, only in paper reports held by the Ministry and insome cases in the form of summarized data (e.g. several species are weighted together).
[15] Total catch (Tm)	Catch biomass	Partial (some species)		Availability is limited, only in paper reports held by the Ministry and insome cases in the form of summarized data (e.g. several species are weighted

				together).

Gaps: Catch data should be recorded separately for each species during sampling programs. Data should be accesible through internet without restrictions. Spatial resolution (wide areas) is too low for local management purposes.

Table 3.4.2

Operational Objective: [Der2] Financial viability and safe working conditions for fishermen by 2013

Indicator	Needed data	Availability		Remarks
		YES	NO	
[34] Total net profit (eur x 10^6)	Monetary assessment		X	Data seriously flawed, at least for artisanal fishermen
[35] Total number of fishermen	Number of licenses	X		

Gaps: Monetary data can be substantially flawed, at least for artisanal fishermen because they can sell directly to public and they produce as few invoices as possible, making impossible to known the real volume of entries. Data are not accessible although they should be stored in the competent Ministry. Data should be accesible through internet without restrictions. Spatial resolution (wide areas) is too low for local management purposes.

Table 3.4.3

Operational Objective: [D3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020

Indicator	Needed data	Availability		Remarks
		YES	NO	
None	Species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…		X	There is not any regular sampling program, at least in Sicily, althoug a catalogation of species distribution and richness will start soon.

Gaps: Conservation and sustainability principles were included in high level legislation (EC, National) but they are not operatively implemented in Sicily. Efforts are made in this way but the process was not concluded yet.

Table 3.4.4

Operational Objective: [Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date

Indicator	Needed data	Availability	Remarks

		YES	NO	
[1] Instantaneous rate of total mortality (Z)	Catch data	X		Poor indicator. Data availability is limited, only in paper reports held by the Ministry and insome cases in the form of summarized data (e.g. several species are weighted together)
[2] Instantaneous rate of mortality by fishing (F)	Catch data	X		Poor indicator. Data availability is limited, only in paper reports held by the Ministry and insome cases in the form of summarized data (e.g. several species are weighted together)
[3] Exploitation rate (E)	Catch data	X		Poor indicator. Data availability is limited, only in paper reports held by the Ministry and insome cases in the form of summarized data (e.g. several species are weighted together)
[4] Mean exploited spawning stock biomass / mean unexploited spawning stock biomass (ESSB/USSB)	Catch data	X		Poor indicator. Data availability is limited, only in paper reports held by the Ministry and insome cases in the form of summarized data (e.g. several species are weighted together)
[5] Mean Catch Per Unit Effort (CPUE) (Kg)	Catch data	X		Poor indicator. Data availability is limited, only in paper reports held

				by the Ministry and insome cases in the form of summarized data (e.g. several species are weighted together)
[38] Total production of fishing products (Tm x 10^3)	Total amount of fishing products harvested from the sea	X		This indicator is poorly fitted to evaluate the evolution of the operational objective

Gaps: Indicators poorly fitted to the evaluation of the operational objective. Indicators [1-4] constitute estimated parameters for fishery models. Fishery models are more or less well fitted to manage pelagic stocks of single species with few interactions (linear trophic chains). They can not cope with multiple species highly interactive through complex food webs and ecosystems, which is the rule in demersal stocks. Moreover, models generally ignore uncertainty, multiple cumulative impacts, genetic drift, metapopulation structure and environmental variability. Currently, models are used to estimate the maximun sustainable yield (MSY) rather than the optimum sustainable yield (OSY) of a species. Indicators [5 and 38] are more easily measured and can be used to manage a reduction of fishing effort till sustainable limits. Such sustainable limits are base on fishery data rather than ecosystem knowledge, which make them fragile in the face of uncertainty. Catch data should be recorded separately for each species during sampling programs. Data should be accesible through internet without restrictions. Spatial resolution (wide areas) is too low for local management purposes.

Table 3.4.5

Operational Objective: [Der5] Preservation of specific issues regarding the cultural heritage (say artisanal fisheries) within a given date

Indicator	Needed data	Availability		Remarks
		YES	NO	
[35] Total number of fishermen	Number of licenses	X		Data availability is limited. Indicator poorly fitted to assess the objective.

Gaps: Indicator poorly fitted to the evaluation of the operational objective since all categories of fishermen are pooled. Lack of definition of the elements that define the cultural heritage. Lack of proper indicators. Lack of representative data.

Availability means true access to the required data (restrictions in data sharing may obstruct access to existing data; such data should be indicated as unavailable and a comment should be provided in *Remarks* explaining the reasons for non-accessibility).

Another important step is the definition of thresholds against which the status of the indicators can be assessed. Any thresholds or reference points should ideally reflect the high level goals for instance such as the sustainable use, thus a respective reference point indicates a level of sustainable use or development. For some established indicators respective thresholds may be defined, while for others thresholds have to be defined. List in table 3.5 the indicators and the availability of thresholds.

Table 3.5

Indicator	Threshold already established		If YES, explain how the threshold was derived (e.g. using the sustainability or precautionary principle)	Trend	If a trend is used instead, elaborate on a good and bad trend
	YES	NO			
[1] Instantaneous rate of total mortality (Z)	Yes		Sustainability		
[2] Instantaneous rate of mortality by fishing (F)	Yes		Sustainability		
[3] Exploitation rate (E)	Yes		Sustainability		
[4] Mean exploited spawning stock biomass / mean unexploited spawning stock biomass (ESSB/USSB)	Yes		Sustainability		
[5] Mean Catch Per Unit Effort (CPUE) (Kg)		No			
[6] Total abundance		No			
[7] Total abundance of spawners					
[8] Total abundance of recruits					
[9] Total biomass					
[10] Maximum sustainable yield (MSY)	Yes		Sustainability		
[11] Total construction of fishing vessels (KW)	Yes		Sustainability	Yes	
[12] Total construction of fishing vessels (GT)	Yes		Sustainability	Yes	
[13] Total upgrading of fishing vessels (KW)	Yes		Sustainability	Yes	
[14] Total upgrading of fishing vessels (GT)	Yes		Sustainability	Yes	
[15] Total catch (Tm)					
[16] Mean catch by vessel (Tm)		No			
[17] Mean catch by day (Kg)					
[18] Mean gross profit by vessel (eur)				Yes	
[19] Mean gross profit by worker (eur)					
[20] Mean gross profit by revenue					
[21] Mean gross profit by invested capital					
[22] Mean net profit by invested capital					
[23] Mean net profit by revenue					
[24] Mean revenue by fishing vessel					
[25] Mean revenue by day (eur)					
[26] Mean price of product		No			
[27] Mean added value by fishing vessel (eur)					
[28] Mean added value by worker (eur)			Competitiveness	Yes	
[29] Mean net profit by gross revenue					
[30] Total invested capital (eur x 10^6)					
[31] Total gross profit (eur x 10^6)					
[32] Total amortizations (eur x 10^6)					
[33] Total interests (eur x 10^6)					
[34] Total net profit (eur x 10^6)					
[35] Total number of fishermen	Yes		Sustainability		
[36] Total number of job positions					

[37] Mean cost by worker	Yes		Sustainability		
[38] Total production of fishing products (Tm x 10^3)					
[39] Total import of fishing products (Tm x 10^3)					
[40] Reduction of production cost (eur / vessel)	Yes		Competitiveness	Yes	
[41] Increase of productivity (Tm / vessel)	Yes		Competitiveness	Yes	
[42] Increase of profit (eur / vessel)	Yes		Competitiveness	Yes	
[43] Ratio of consumption of local products in the domestic market (total product / apparent consumption)			Competitiveness	Yes	
[44] Value of total production (eur x 10^6)			Competitiveness	Yes	
[45] Number of collective actions	Yes		Competitiveness	Yes	
[46] Number of local management plans	Yes		Sustainability		
[47] Number of facilities	Yes		Competitiveness	Yes	
[48] Number of projects to enhance services to fishermen in ports	Yes		Competitiveness	Yes	
[49] Number of fishing vessels regarded	Yes		Competitiveness	Yes	
[50] Number of projects to develop markets	Yes		Competitiveness	Yes	
[51] [Number of] pilot projects (ARs, restocking)	Yes		Competitiveness	Yes	
[52] Number of production operators	Yes		Competitiveness		

For the indicators listed in table 3.5 where no threshold is established yet and no trend will be used, describe how the threshold will be derived to conduct step 4 either using 1) historical data, 2) model estimates, 3) reference areas (high pressures vs. low pressure) or 4) expert knowledge. Subsequently the rational and derived thresholds should be outlined.

Based on the above tables summarise the existing gaps preventing the estimation of the selected indicators and propose solutions, such as a monitoring program to collect additional data to fill these gaps, or how to obtain access to existing data that are not open.

Step 4: Risk analysis and state assessment

After the performance indicators have been selected and their thresholds (or trends) determined (step 3), step 4 now looks into the technical characterisation of risk (step 4.a) and state (step 4.b) and the differentiation between both depending on the actual state of development of the spatial management plan. If a spatial management plan is not in place, step 4 should calculate the likelihood of meeting the operational objectives (i.e. risk analysis, step 4.a). If a spatial management plan is in place, step 4 should (also) calculate whether or not the operational objectives were met (i.e. state assessment, step 4.b). The output of step 4, the characterization of the risk or the actual state, will feed into the evaluation of meeting the operational objectives (step 5), where the interpretation of the risk analysis and or state assessment will be carried out.

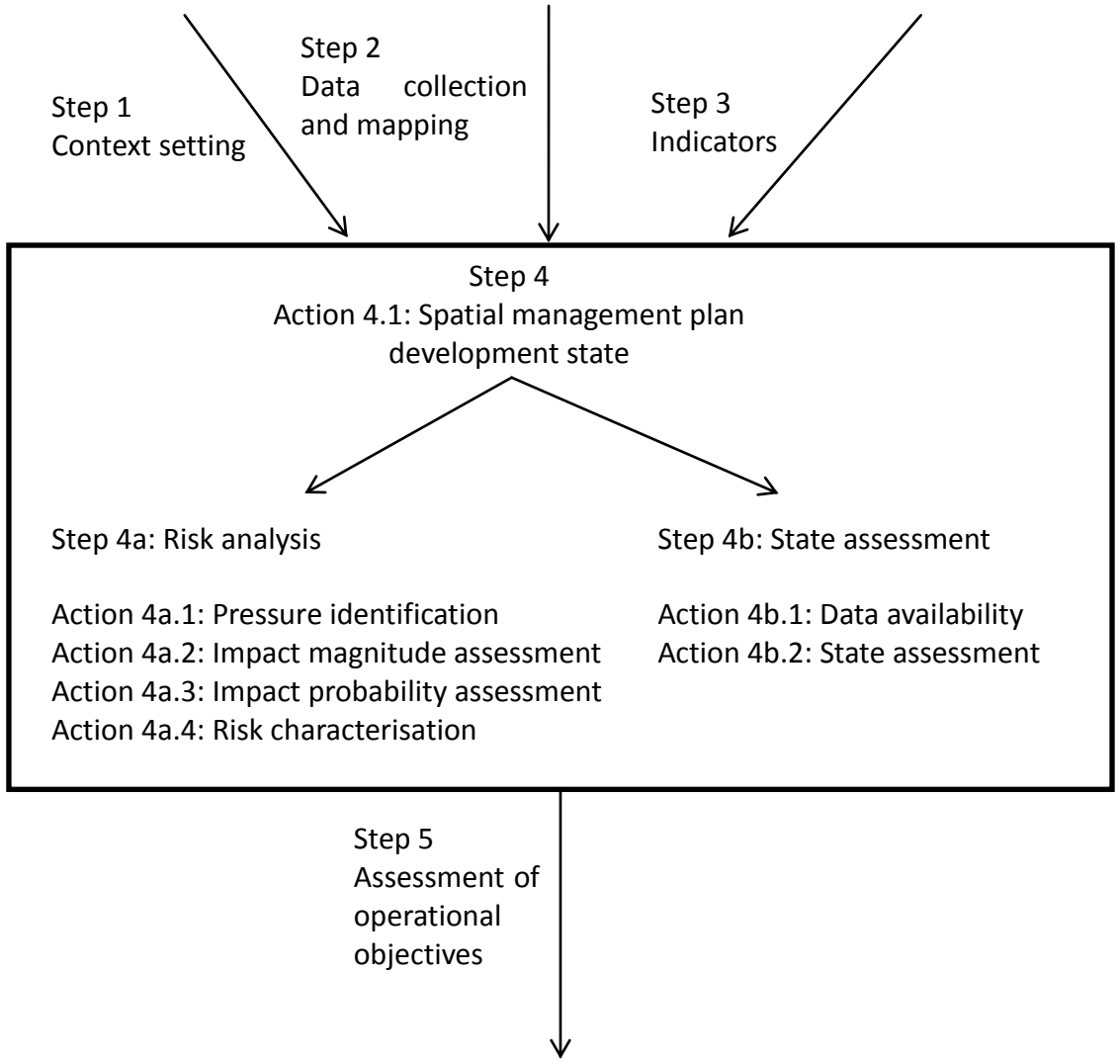


Figure 4.1: Work flow of step 4

Action 4.1: Spatial management plan developmental state

Depending on the stage of development of the spatial management plan considered, step 4 will pass through a risk analysis (step 4.a) or a state assessment (step 4.b).

Before management measures to achieve the operational objectives are implemented, several alternative spatial management plans (= scenarios), each with their specific management measures should be developed and their anticipated efficiency evaluated and compared through a risk analysis. The steps to be taken to run this risk analysis are comprised under step 4.a.

When management measures to achieve the operational objectives are implemented, the actual state, as obtained through the implementation of the management plan, should be checked against the anticipated thresholds or trends of the indicators (Step 3). The steps to be taken to run this state assessment are comprised under step 4.b.

Evaluation of the spatial management plan developmental state based on the results of Step 1:

- spatial management plan not available: go to step 4.a.
- spatial management plan available but not implemented: go to step 4.a.
- spatial management plan implemented: go to step 4.b.

Step 4a: Risk analysis

Action 4a.1: Pressure identification

Using the information on pressures, collected in step 2b, and the indicators, taken from step 3, list them in table 4a.1 below.

Table 4a.1

Indicator	Pressure

Action 4a.2: Impact magnitude assessment

Using available literature, assess the magnitude of the impact these pressures will have on the indicator. In other words: Is the impact high, medium or low? Fill out table 4a.2 to summarise this.

Table 4a.2

Indicator	Threshold / Trend	Pressure	Magnitude of Impact (high, medium or low…)

Action 4a.3: Probability assessment

Using the maps produced in steps 2a and 2b and GIS tools identify where there may be overlap between the indicator and pressures. Produce GIS maps which indicate these overlaps occur and whether the likelihood of occurrence of an impact is high, medium or low.

Table 4a.3

Indicator	Threshold / Trend	Pressure	Likelihood of occurrence

Action 4a.4: Risk characterization

The information in table 4a.2 and 4a.3 shall be used to fill out the scoring matrix given in table 4a.4.1 to assess the overall risk. < 3: Low risk; 3-4: Medium risk: > 4: High risk.

Table 4a.4.1

Likelihood	High (3)	3	6	9
	Medium (2)	2	4	6
	Low (1)	1	2	3
	Impact	Low (1)	Medium (2)	High (3)
	Risk: Low:1-2, Medium: 3-4, High: 6,9			

Fill out table 4a.4.2 below to characterise the risk.

Table 4a.4.2

Indicator	Pressure	Risk (low, medium or high)

Step 4b: State assessment

Action 4b.1: Data availability assessment

This action evaluates the data availability (taken from step 2) for a proper evaluation of the status of the indicators, relative to their respective thresholds or trends (taken from step 3). This action should be performed on an indicator by indicator basis. If good data are available for a given indicator, the indicator's status can be evaluated in action 4b.2. If no good data are available for a given indicator, then the process of its state assessment halts here until the appropriate data can be collected. In this case, the risk analysis outlined in the previous actions has to be undertaken as an intermediate solution.

Question to be answered:
Does the available data, taken from step 2, allow for the assessment of the status of the indicators, selected in step 3?

Table 4b.1

Indicator	Data availability?

Action 4b.2 Indicator state assessment

When good (= appropriate) data are available, these data are now to be used to quantify (or qualify) the status of the selected indicators (= monitoring, based on existing data) and evaluate this figure relative to the indicator's threshold or trend.

Table 4b.2

Indicator	Indicator status	Indicator threshold or trend	Evaluation

Step 5: Assessing findings against operational objectives

The aim of step 5 is to look at the results of the risk analysis and/or state assessment and interpret these results in terms of whether the operational objectives have been achieved or failed, by how much and their relative importance in terms of future management adaptations. In order to achieve the aims of this step several actions are proposed. First, a summary of the state or potential state of the indicators and how these are linked to the operational objectives is completed. Secondly, an overall table which lists the operational objectives and indicates if these have been achieved or failed, how successful or unsuccessful they were, how important operational objectives were in terms of each other and how they can be weighted to inform future management (step 7). Finally, there is an opportunity to revisit the evaluation of indicators (step 3) to assess if the indicators used in step 4 were appropriate for analysis. The outputs from step 5 will be table 5.2 assessing the operational objectives which will feed into step 6 and step 7. A second table (5.3) will highlight if indicators used for analysis were appropriate which will feed into step 7.

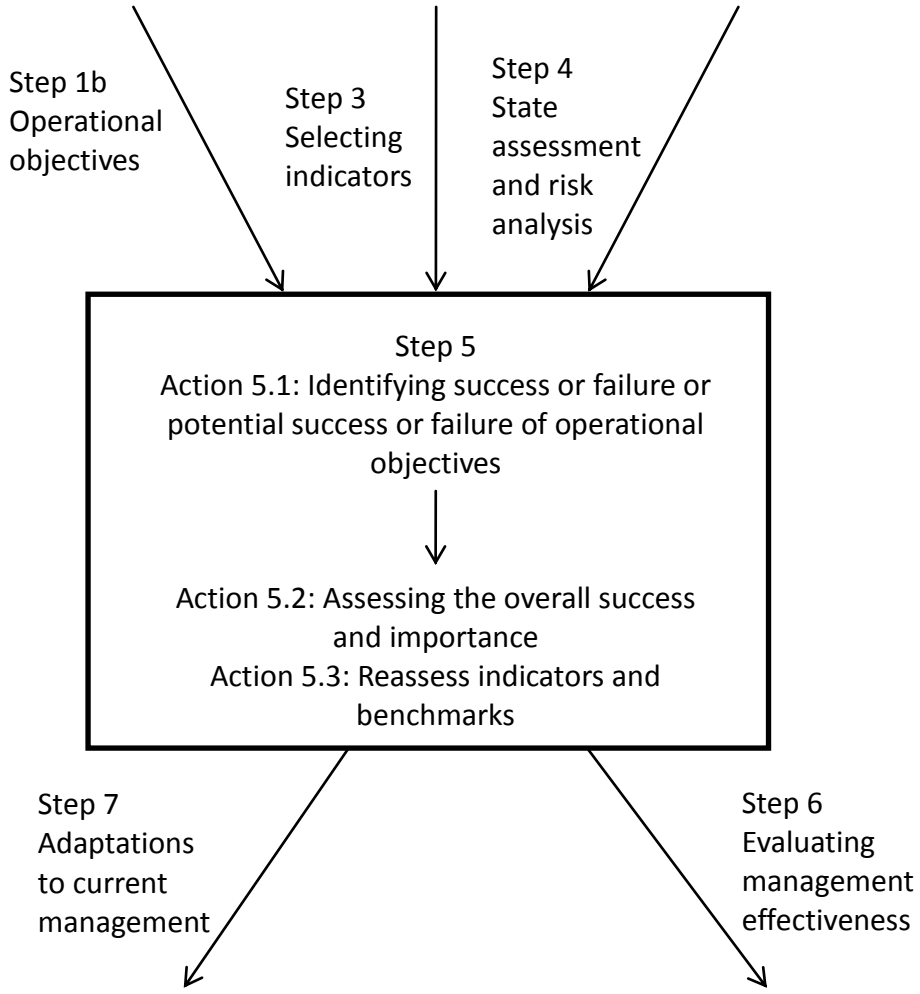


Figure 5.1: Work flow for step 5

Action 5.1: Identifying success and failure of objectives

This task provides a technical summary of the risk analysis and goes one step further by linking indicators back to their operational objectives. It is broken up into two sections depending on the type of analysis that has been carried out in the risk analysis / state assessment of step 4. If a **state assessment** is carried out then it is possible to clearly identify whether objectives have been met or not. If a **risk analysis** has been carried out then we can only investigate the risk of the objective to fail the state assessment. Where trends were used as benchmarks then descriptive text on their performance should be provided. Where a threshold is used then a definitive answer on state or potential state of the indicator should be presented as well as an indication of the extent of the gap.

State assessment:

Using the indicators selected in step 3 and the trend assessment performed in step 4, compare the current status to the target indicator. Use these to fill the tables below for both environmental and socio-economic objectives. The extent of gap can be either a qualitative or quantitative description of the observed gap.

Table 5.1.1

Environmental operational objective	Indicator	Current level	Threshold/Trend	Extent of gap (where applicable)

Table 5.1.2

Socio-economic operational objective	Indicator	Current level	Threshold/Trend	Extent of gap (where applicable)

In the next step, prioritise the gaps in terms of importance to meet the operational objective i.e., identify the gaps which are most severe. Fill table 5.1.3 below in decreasing order of priority:

Table 5.1.3

Operational objective	Gap (in order of most important to least important)
	1)
	2)
	3)
	4)
	...)

Risk analysis:

Using the results of the risk analysis summarise where the risk of the indicator being in an undesirable state is high, medium or low and link this to operational objectives by filling out the summary tables below for environmental and socio-economic objectives.

Table 5.1.4

Environmental operational objective	Indicator	Risk (high, medium or low)

Table 5.1.5

Socio-economic operational objective	Indicator	Risk (high, medium or low)

Action 5.2: Assessing the level of success and importance

This action requires confirmation on whether the operational objectives have been achieved or failed, and a weight assessment on their importance for the development of future management options.

- Based on the results summarised in tables 5.1.1-5.1.5 above indicate in table 5.2. whether the operational objective has been achieved (a) or failed (f).
- Fill out column three using decisions made based on importance from table 1b.6.2 regarding the rank of operational objectives in order of importance depending upon the higher level goals of the SMA.
- Give objectives a weighting based on their need for development of future management where 1 is not relevant e.g. objective is met therefore no adaptations to management is needed and 5 is very relevant e.g. failure in an important operational objective for the high level goals of the SMA therefore it is important that adaptions to current management are made.

Fill in table 5.2 to summarise this:

Table 5.2

Operational objective	Achieved (A) or failed(F)	Rank of importance of objective	Weighting of relevance for future management

Action 5.3: Reassessing indicators and thresholds

Step 3 of this manual describes the criteria for selecting appropriate indicators and thresholds. It provides an opportunity to evaluate how effective indicators and thresholds are in conveying the success or failure of operational objectives. Use a separate table for each indicator.

Table 5.3

Evaluation question	Score (good=3; medium=2; poor=1)
Did the indicator provide a response directly related to the intended objective?	
Were the indicators and thresholds easily to communicate (especially to stakeholders)?	
Were there sufficient data available to measure the indicator?	
Was the indicator sensitive enough to change over the relevant temporal scale defined in step 1a?	
Was the indicator cost effective?	
Sum	
Viability score from step 3	

Score from this assessment:
5-8= Indicator's performance was poor and an alternative indicator should be developed to assess that type of objective
9-12= Indicator's performance was medium. Take some time to look into the areas where the indicator did not perform well e.g. cost effectiveness before assessing if a change to the indicator is necessary.
13-15= Indicator's performance was good and should be reported as a useful indicator to assess that particular objective.
Overall using the two scores from step 3 and step 5 the performance of the indicator can be summarised.

Step 6: Evaluate management effectiveness

The aim of step 6 is to evaluate the success of existing or planned management measures in terms of achieving the operational objectives (implemented or recommended). Where there is no management plan in place, existing management measures can be evaluated for how they might contribute to achieving operational objectives. This will identify possible gaps where new management measures might be needed. In order to achieve the aims of step 6, we will assess the success of the management measures (as defined in step 2c) in the light of the objectives (step 1b), which includes a discussion about why individual management measures did or did not meet the expectation in achieving an operational objective (as listed in step 5). The outcome of this work package will be a table showing which management measures were/ were not/were partly successful for which objectives. The table will be accompanied by a text explaining the outcome of the table. This text will be focusing on the objectives that have not or only partly been met and discuss potential explanations to these outcomes with reference to management measures used. It is important to recognise that the management effectiveness in achieving the goal/objectives for each SMA will be evaluated on a scientific basis, including the key pressures from particular sectoral activities, through previous steps of the MESMA framework. To complement this scientific evaluation, it is important to understand the views of different stakeholders (governance, management, operational and others) on the effectiveness of the existing management measures in achieving the environmental goals/objectives, including their views on the validity of these objectives. These views will be explored through the governance research and input into the MESMA framework analyses. Thus the final output of this step will make clear where (recommendations for) adaptation to current management is needed, which is used as input in step 7. The governance framework will assess effectiveness of management measures in terms of existing and potential governance approaches and stakeholder views on effectiveness.

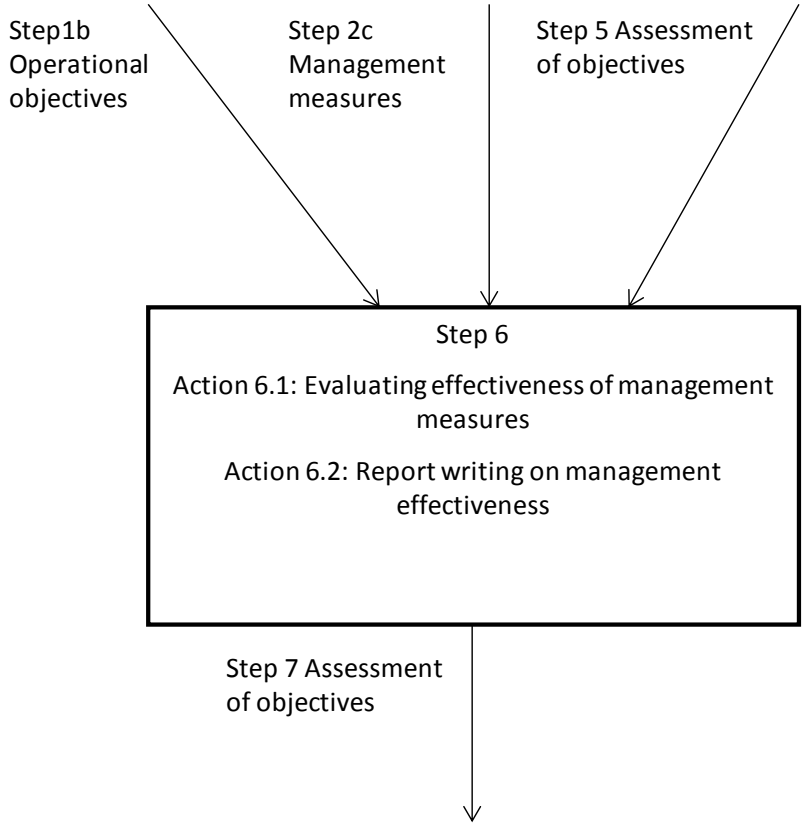


Figure 6.a: Work flow chart of step 6

Action 6.1: Evaluate effectiveness of management measures

Using the outputs from actions 1b, 2c and 5, summarise what management measures are being used to help achieve the respective operational objectives. Where no management plan is in place, hence no measures are set for specific objectives, fill out existing management measures and link these to how they might contribute to the operational objectives.

Fill out the table 6.1 below linking management measures to objectives.

Table 6.1:

Operational objective	Management measure	Useful? yes/no/partly	Achieved yes/no/partly

Using table 6.1 above discuss for each operational objective which management measures have contributed most to the success or failure of an objective. This activity is largely an expert based opinion approach and those involved with discussions should be carefully selected. It is also important to integrate such expert opinions with stakeholder views to give a full picture of the effectiveness of the management measures and their distributional effects. Stakeholders' views and perspectives on the effectiveness of management measures will be explored through the WP6 governance research.

Governance analysis

Action 6.2: Write a report on the management effectiveness

A final report which will feed into step 7 should now be written and include information which discusses the current management system and where this is being successful or where this is failing. Where no management plan is in place, gaps to where new management measures are needed to meet the operational objectives can be listed. The reasons why the management measures are useful or not will also be considered and ideally include ecological, socio-economic and governance reasons.
To discuss the current management measure(s) please use the following structure:

- Write short summary paragraphs on each objective from table 6.1 focusing individually on the management measures that (i) were successful; (ii) were partly successful; (iii) were unsuccessful. These paragraphs should each include ideas on why management measures were successful / partly successful/ unsuccessful.
- Summarise for each management measure if it was mainly successful/partly successful / unsuccessful in contributing to the objective. This includes a critical evaluation of whether or not the taken management measure is linked well to the operational objective.
- If applicable discuss gaps where new management measures are needed to help achieve the operational objectives.

Step 7: Recommend adaptations to current management

Depending on the suitability of the current management, adaptations might be needed. In step 7 recommendations of adaptations are produced if needed. Step 7 is based on results from earlier steps, using the outputs from step 5 and 6 as inputs. The aim of step 7 is to write a report on adaptive management needs for the SMA. In order to write this report, results from steps 5 and 6 are used to determine if adaptations to current management are needed and results are prioritized according to action 5.1. Alternative policy scenarios are developed, improvements in management strategies are recommended and a reality check of the recommendations is performed. Recommendations are also checked against EU policies. Finally a report on adaptive management needs for the SMA is written. The output is the report on adaptive management needs for the SMA. Step 7 will link to the governance framework (WP6) by assessing the governance approaches that could support the implementation of the management recommendations. This is the key stage at which the MESMA framework and the governance research analyses are integrated or 'blended', drawing on: 1) The validity and feasibility of the goal/objective from a stakeholder (governance analysis) and scientific perspective (generic framework); 2) Potential restrictions that are recommended from a scientific perspective (generic framework), i.e. the application of the MESMA framework, ranging from temporal/spatial restrictions to complete bans, on particular sectoral activities that lead to pressures that are undermining effectiveness in achieving goals/objectives; 3) The validity and feasibility of implementing these restrictions from political, legal, policy and stakeholder perspectives (governance analysis).

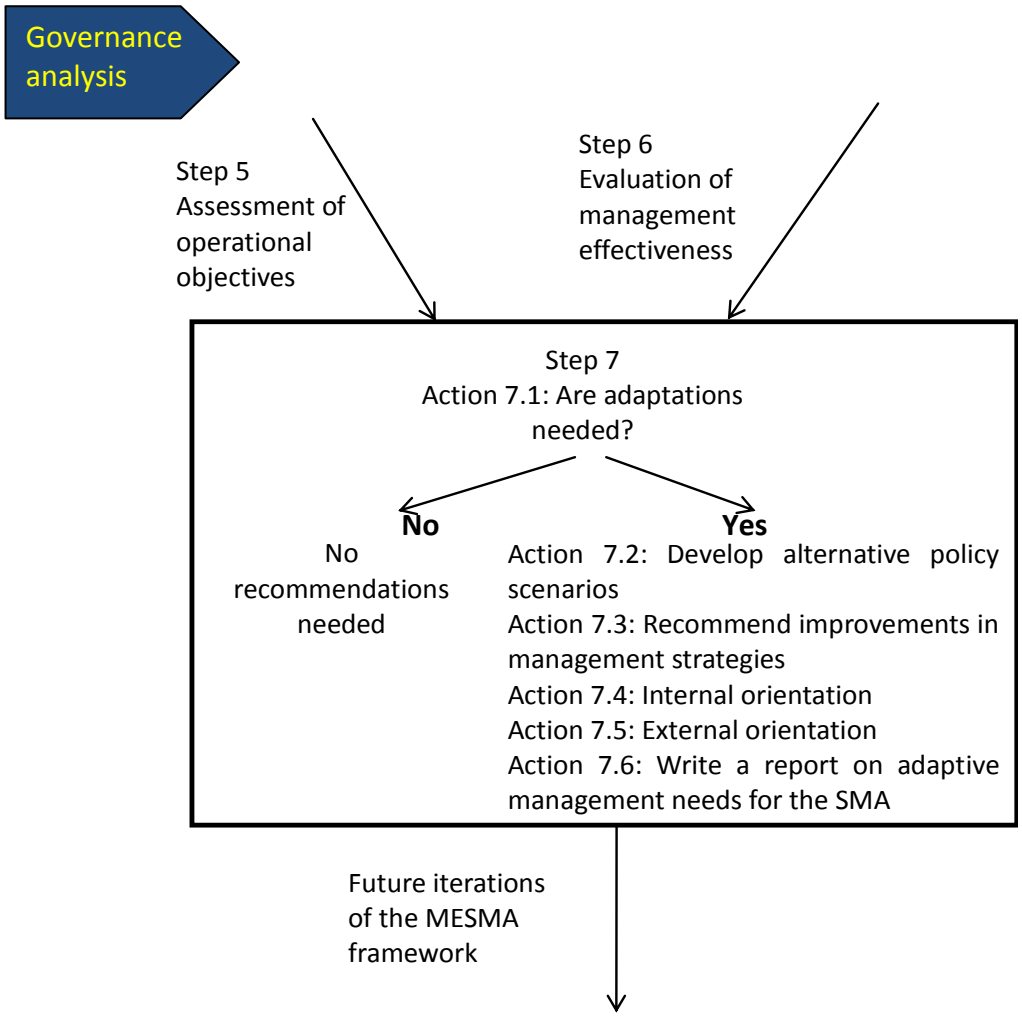


Figure 7.1: Work flow for step 7

Action 7.1: Using the outputs from step 5 and 6 identify if adaptations to current management are needed

Use outputs from step 5 and 6. Are there any existing gaps or drawbacks?

Yes.

- If not, no recommendations needed. Go to action 7.6.
- If yes, proceed with action 7.2.

Action 7.2: Develop alternative scenarios

Often 'Scenario' is used as an overarching term for management scenarios. In this step we use the definitions for scenario v2 and v3 'A well-defined, connected sequence of features, events and processes that can be thought of as an outline of a possible future condition of the repository system.', 'technique for presenting alternative futures' (See MESMA WP2 Glossary)

Scenarios are a technique for presenting alternative futures. This step is one of selection - since only the most important adaptive management needs will justify a place in the scenarios. At the end of the process, management's attention must be focused on a limited number (two to three) of the most important issues. Experience has proved that offering a wider range of topics merely allows them to select those few which interest them, and not necessarily those which are most important to the organization. There is no theoretical reason for reducing to just two or three scenarios, only a practical one. It has been found that the managers who will be asked to use the final scenarios can only cope effectively with a maximum of three versions.

In order to develop alternative scenarios first redefine operational objectives. Use the priority list from table 5.2 to choose operational objectives for scenario writing. Next select the main type of the alternative scenario to develop: 1) studying the facts of a situation, 2) selecting something that may happen (e.g. seawater warming), and 3) imaging the various ways for that development to occur and the sequence of events that it might follow. For types 2 and 3, apply trend-impact analysis as a method to predict the future by looking at the effects of trends over time and decide the main drivers for change.

The following operational objectives were derived for the Italian counterpart of the Strait of Sicily.

[Der1] Reduction of fishing mortality by (roughly) 20% within 2013.

[Der2] Enhancement of welfare by 2013

[Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020.

[Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within 2013.

[Der5] Preservation of fisheries cultural heritage.

Conservation objectives were derived from high level documents (policies and laws) because there was not any management plan in place, apart from the generic management framework of Natura 2000 for SCIs. The resulting operational objectives are an attempt to capture the rationale underlying the several policies of reference: the Marine Strategy Framework Directive, the Habitats and Birds Directives, as well

as the 2020 Biodiversity Strategy. The Water Framework Directive, although being relevant, is applicable to a small fraction of the study area (the coastal waters of the islands). The operational objectives incorporate terms that were found to be common across different policies, legislative documents and regulations. The operative objectives tried to be as SMART as possible by specifying biodiversity components and by taking the EU Biodiversity Strategy deadline but, in doing so, they depart from the real situation.

Fisheries objectives were derived from high level documents (policies and laws) as well as the sectoral management plans already in place.These were two Italian national frameworks (the Italian National Strategic Plan for Fisheries and the Italian National Operative Program 2007-2013) plus a number of plans for different fisheries segments (the Management Plan GSA 10 Middle-South Tyrrenian Sea for trawl, the Management Plan GSA 16 (Sicily Strait) for trawlers > 18m LOB, the Management Plan (Sicily) for trawlers < 18m LOB, the National Management Plan for boat seines and the Management Plan of the Sicilian fleet of purse seines for small pelagic fishes). The derived operational objectives are intended to catch the rationale of the high level policy of reference (the Common Fisheries Policy) by taking into account environmental concerns and the preservation of the cultural heritage held by the workers of the fisheries sector. However, these aspects become lost in the transfer from high level policies to local management plans. Therefore the derived operational objectives somewhat depart from the management plans in place. The derived operational objectives were retained in the model for the purposes of scenario depiction since they help to highlight some important relationships.

Climate change was considered as (an external) driver. In the present context “external drivers” are referred as the forces driving system change that are not under the control of policymakers. Rather than quantitative predictions for the study area, the effects of climate change effects were explored through the expected variation in the rate of invasion by exotic species since this issue is of special relevance for the new EU 2020 Biodiversity Strategy.

In addition, the envisaged development of the energy industry was considered as another (internal) driver in order to generate qualitative scenarios.

There were two alternative scenarios that, rather than being mutually exclusive, represent two possible extremes in policy vision and management approach. Scenarios were focused on nature conservation and fishery sustainability under climate warming and the developing energy industry. Alternatives are given priority to wind-generated energy (S1) or the exploitation of fossil fuels (S2).

(1) FACTS OF THE SITUATION

Conservation

Nature conservation is actually considered a priority in the European legislation, as well as in many regional and international treaties. The Strait of Sicily encompasses two subregions, the Italian and the Maltese ones. Maritime jurisdiction is rather complex here and includes Territorial Sea, both for Malta and Italy, Ecological Protection Zone for Italy (established in 2006), Exclusive Economic Zone (established in 2004) for Malta.

The Strait of Sicily holds important species and habitats that deserve protection, based on the following conservation criteria:

(a) Uniqueness or rarity. Habitats/species/geomorphological features that could be considered rare, depending on the scale of observations, include:

(a.1) Geomorphological features: Submarine volcanic activity; mud volcanoes; (potential) cold seep.

(a.2) Habitat forming species: The scleractinian coral *Cladopsammia rolandi* (endemic to the Mediterranean), cold water deep-sea coral mounds composed of *Lophelia pertusa*, *Madrepora oculata* and *Balanus* spp., the yellow tree coral *Dendrophyllia cornigera*, the octocorals *Isidella elongata*, red coral *Corallium rubrum* and *Funiculina quadrangularis*. The potential presence of cold seep communities. Coralligenous communities and "mäerl" beds exist in places where bottom trawling is not allowed.

(a.3) Other species: Maltese skate *Leucoraja melitensis* is now confined largely to the Sicilian Straits. A colony of an undescribed species of large deepwater oyster (*Neopycnodonte* sp.) has been recorded living on fossilised coral mounds in the Linosa Trough.

(b) Special importance for life history stages of species. Interactions of hydrological features with the bottom orography create suitable spawning and recruitment conditions for a number of demersal and pelagic species of economic and/or ecological importance.

(c) Importance for threatened, endangered or declining species and habitats. Bottlenose dolphins inhabit inshore waters around the Pelagie Archipelago. Striped dolphins and fin whales are also present in the area, while loggerhead turtles, leatherback and green turtles are observed occasionally. The Maltese skate, great white shark, porbeagle, shortfin mako, sandbar shark, giant devil ray, and blue shark are also present. Bluefin tuna populations are declining drastically as a result of overfishing.

(d) Vulnerability, fragility, sensitivity, or slow recovery. Benthic habitats and communities summarized in point a.2 are vulnerable and fragile. Species specially sensible to human effects and slow to recover include: fin whales, numerous species of elasmobranchs and the turtles.

(e) Biological productivity. Total biomass of demersal fish species is particularly high on the Adventure Bank, to depths of 100 m. Other specially productive benthic habitats include those in point a.2 above.

(f) Biological diversity. A persistent area of high demersal fish species diversity is located on the Adventure Bank, up to depths of 100m. High demersal fish species diversity is also recorded at 400 – 600m in the northwest of the Sicilian Straits and on the eastern edge of the Maltese EEZ. Benthic habitats with high associated species diversity also include those summarized in point a.2.

Protection in the region is generally at Territorial Sea level, where nation legal frameworks are in rule (basically the act 979 for Italy and the Flora, Fauna and Natural Habitats Protection Regulation plus the Environment Protection Act for Malta). Italy has already established Egadi and Pelagie Marine Reserves and the one of Pantelleria is ongoing. Malta has two Integrated Coastal Zone Management (ICZM) plans (Ghajn Tuffieha Bay since 1997 and Ramla Bay since 2001). Apart from this, Malta also has some protection areas around shipwrecks and three marine protected areas. In addition there are NATURA 2000 sites which, for the Italian counterpart, mostly coincide with the Marine Reserves and in Malta is the Rdum Majjiesa to Ras ir-Raheb protected area.

Additionally, an international process is aimed to establish large-size high seas MPAs in the region, including vast areas of the Strait of Sicily proposed by Greenpeace, WWF and ACCOBAMS (see http://medabnj.rac-spa.org/).

The above mentioned initiatives of protection in the region are not coordinated, the exception being the network NATURA 2000. Generally, managing plans are lacking in Italy and very little scientific information is available across the whole study area.

Exploitation of fossil fuels

The demand for energy is continuously increasing in Europe. As an indication of the trend, the volume of gas imported to Europe through the Strait of Sicily by pipeline has been multiplied by a factor of 3 during the last thirty years, from $12.3x10^9$ m^3 per year by 1983 to $38.3x10^9$ m^3 per year by 2012.

Exploration of gas and oil deposits is increasing off the southern coast of Sicily and around Malta. Concessions covering more than 8000 Km^2 of the Strait of Sicily have been released by the Italian Ministry for the Economic Development, but heavily contested by the Sicilian Government and coastal municipalities. In Malta, drillings have been carried off the south coast by July 2011. The Resources Ministry is the authority involved in the assessment of oil drilling in Malta. Concessions extend well over the territorial sea, since national sovereignty covers the whole continental self for the exploitation of subsoil resources. Although concessions are valid for five years, they can be (and have been) "frozen" by the oil companies owning the exploration and cultivation rights.

The concessions are released for exploration or cultivation (i.e. extraction) of hydrocarbon deposits. Seismic shooting is intensively used for exploratory purposes. Subsequently wells are drilled and finally oil is extracted on platforms for a number of years. Untill recently, only three oil platforms exited on Sicilian waters plus a few oil wells located in Malta.

For forecasting purposes, it is worth to consider the arrival of new drilling and extraction technologies during the last ten years, which made the exploitation of previously inaccessible hydrocarbon deposits feasible. These methods are collectively called "fracking". Oil and gas obtained through fracking are regarded as "unconventional" ones.

Fracking allows the exploitation of hydrocarbons locked in shales, which are abundant in continental shelfs and self-edges in Central Mediteranean. The world reserves of unconventional hydrocarbons are generally large and, more important, would provide energetic independence to many developed countries. This argument is being considered important enough to counterbalance associated environmental impacts as the global warming that can be expected from burning the massive reserves of unconventional hydrocarbons to carbon dioxide.

Fracking consist in a combination of deep precision horizontal drilling with hydraulic fracturing of non-porous rocks holding oil and gas. Precision drilling allows to deploy a pipe that follows the shape of the shale deposit. A fluid containing (secret) flocculants and sand is subsequently injected at high pressure through holes in the well casing, provoking fractures in the non-porous rock bed. After ceasing the pressure, the gas and oil flow into the pipe through the holes, while sand maintain the fractures in the rock open. Releasing of substances from the subsoil after drilling is considered to be absent, but accumulating evidence suggest that is not impossible.

Wind-generated energy

Wind-mills are electricity generators moved by the energy of wind. In principle, eolian generators do not consume limited resources (other than space) and do not generate green-house gases. Therefore the electricity obtained from wind is usually referred to be a "green" one. Generators are placed onto towers high enough to intercept winds free of shear with the sea surface. Towers can be fixed directly to the sea bottom or through an anchored platform that lays under the sea surface. Single towers are linked through an electrical network that transport electricity to accumulators located on land.

There are several projects for the construction of wind-mill farms in the banks of the Strait of Sicily in the next few years. These include the Adventure bank (with a total power of 60 MW), the Pantelleria bank (168 MW) and the Talbot bank (354 MW). Malta is also proposing to introduce an off shore wind farm close to shore at Is-Sikka l-Bajda which is located on the North-East coast of Malta, about 1.5 km off the coast of Rdum tal-Madonna, limits of Mellieha. The proposed Sikka l-Bajda wind farm would be located 3

to 5 km from the tourist accommodation area of St. Paul's Bay, Bugibba and Qawra and 5 km away from Ghadira beach.

Biological invasions under climate warming

Small, semi-enclosed seas like the Mediterranean can be regarded as early indicators of the effects of climate change. This is due to their relatively small volume of water and the strong influence of the surrounding land masses with respect to the oceans. Such small volume of water provides little thermal inercy, while the proximity of the land masses imply intense heat exchanges and the substantial influence of riverine waters. The result is that oceanographic patterns that influence marine life, like nutrient cycling, surface water circulation, vertical mixing and stratification of water masses, upwellings, concentration fronts and retention gyres, will change faster in the Mediterranean than in the oceans. This is specially the case of the Strait of Sicily, which is both shallow and strongly influenced by the energy of the water fluxes between the western and the eastern Mediterranean sub-basins. In fact, such energy is the main cause of the high biodiversity and productivity values found in the area. Global warming is changing the balance between those fluxes and is suspected that the oceanographic circulation pattern is already changing. Other oceanografic features could also change or become disrupted.

The Strait of Sicily is one of the main shipping routes of the world, linking the North Atlactinc area to the Indo-Pacific one. This provide a privileged vector for the spread of exotic (or alien) species. Although biological invasions have been repoted by both Atlantic and Indo-Pacific species, the second group can be expected to become progressively dominant. The reasons are the fact that the Mediterranean fauna is biogreographically close to that of the Indo-Pacific area. Moreover, the Mediterranean is becoming warmer. Therefore the Indo-Pacific fauna is adapted to environmental conditions quite similar to those found in the Mediterranean Sea. Until recently, migrations through the Suez Canal were largely curtailed by the salinity barrier represented by the Bitter Lake. However, the dilution of the salt deposits of the lake is progressively changing the picture. This evolution could be even accelerated by the planned enlargement of the capacity of the canal.

There are several hundreds of exotic species already stablished in the Mediterranean. While it is generally agreed that only a small fraction of invasions has noticeable effects, it is also know that some invasions lead to the substitution of local species by exotic ones, local extinctions, parasite booms, changes in the composition of ecological communities and also in the type and intensity of interactions among species. In a few cases, the changes prompt dramatic consequences for the economy and the biodiversity of the area. For example, some fisheries collapsed when fish larvae were massively predated by an exotic jellyfish in the Black Sea; and coastal rocky communities are currently subjected to smothering and burial in coastal Turkish waters after the bloom of an exotic coccolith. More rarely, exotic invasions can have positive effects, like supporting or diversifying some fisheries in Israel.

(2) WHAT IS (OR COULD BE) GOING TO HAPPEN.

It has been already settled that global warming is ongoing all over the world, and there is little doubt that gree-house gases from the combustion of fossil fuels speed up such climatic change. The Strait of Sicily is particularly sensible to the effects of climate warming due to the complex interplay of oceanographic features moved by the movement of distinct water masses differing in salinity and temperature.

The projected increase of the capacity of the Suez Canal will further prompt shipping traffic through the Strait of Sicily, which is a valuable economic activity in the area. The ecosystems of the Strait of Sicily have been substantially modified through fishing from early times, and the presence of acuaculture facilituies add complexity to the burden of factors facilitating invasion by alien species. Summing up these factors it is easy to envisage that the rate of biological invasions will increase in the area in upcoming years. It is

possible that few of them will have negative effects for nature conservation and the economic sustainability of fisheries, and even fewer could have some positive effects.

The energy consumption pattern in the Strait of Sicily, and more generally in Europe, is changing rapidly after the accident of the nuclear power plant of Fukushima in Japan. The public opinion is exercising considerable pressure to block nuclear energy in European countries. This is likely to prompt rennovated interest in non-nuclear sources of energy. It can be reasonably assured that “green” and “unconventional” sources of energy, which are both abundant and cheap, will drammatically increase in most European countries with little or no access to other sources of energy. On one hand, Italy and Malta are both densely populated and surrounded by seas, were wind-mill farms raise little concern among citizens and do not suffer from the curtailing effect of land-masses. On the other hand, substantial shale-locked hydrocarbon deposits located in the continental shelfs and shelf-edges attracted the attention of oil companies. It is hence probable that the maritime territory will be subjected to space claim from energy companies to place off-shore wind-mill farms as well as oil and gas exploitation platforms. These activities directly impact the marine environment, raising conflicts with conservation and tourism. Fishing and shipping are also affected by the loss of fishing grounds and space, respectively. In addition, wind-mill farms, oil platforms and gas ones act as stepping stones facilitating the dispersion of alien species.

The main impact of oil exploration is the production of high levels of noise by shooting air-compressed guns. The intensity and frequency of this acoustic contamination has a negative effect in marine mammals. It is less clear the impact of such noise on fishes, since dissimilar results are reported in scientific literature. It seems probably that the effect of seismic shooting on fishes depends on the focused species. During the drilling phase, the resulting mud is usually deposed around the facility and can release toxic substances as heavy metals. During the platform operation, diffuse oil spillages are known to occur. Diffuse oil spillage is the main source of oil contamination in the sea. The local landscape is also disrupted. Bottom structures are left onto the bottom after use and obsolete platforms are commonly sunk. Apart from conservation issues, conflicts could arise becouse the naturalness of the area decreases and any other activity is not allowed within the close neighbourhood of the wells.

Projects for wind-mill farms in the Strait of Sicily contemplate the direct anchorage of generators to the rocky bottom of the off-shore banks. This is in conflict with conservation efforts, since off-shore banks communities are both exclusive and fragile. In some instances, banks hold the last remains of relict Mediterranean communities in a near-pristine status that is impossible to find in any other place. In addition, banks are of main importance for the sustainability of many fished populations due to their role in the oceanography of spawning and nursery grounds. Moreover, would facilitate sport fishing by concentrating fishes (FAD effect) and allowing easy localization of the banks. Off-shore MPAs covering some off-shore banks and the area around Malta have been proposed by international organizations.

Therefore the marine environment can be expoected to degrade as the result of impacting energy exploitation and enhanced invasion by exotic species. Since thse are promoted by economic activities of strategic importance for the involved countries, it would be unrealstic to expect any significant change by further regulating the activities themselves.

(3) POSSIBLE SEQUENCE OF EVENTS

If wind-generated energy are substantially promoted, e.g. through the implementation of appropriate policies, off-shore banks will face a serious environmental impact derived from the physical occupance of their biological communities down to 20-35 m depth in order to place the towers onto the bottom. In adition, water circulation will change around the towers as a aresult of their physical presence. It is unclear the type of effects that the altered circulation pattern could have on the local communities, since these are unknown for rocky and coralligenous communities. These impacts can be expected to be relatively limited in extent (that of the banks) and chronic.

The physical occupation of banks by mills would delete little fishing grounds to the industrial fishery, mainly represented by trawlers. However, it would make banks very easy to locate by sport fishermen that, with the aid of proper technology like eco-sounders and vertical jigging, could easily deplete large, "relictic" spawners of fishes targeted by industrial fisheries. Such large individuals could both inhabit the banks (e.g. groupers) or being attracted by the vetical profile of the bank and the associated water mixing (e.g. amberjacks). The impact of such selective deletion is unknown because the reproductive potential of individuals inhabiting the banks is unknown. However, indirect evidence like the reports of few professional and sport fishermen operating around banks and shipwrecks suggest that such impact could be substantial. Finally, it is actually unknown what type of impact could have the generators' magnetic fields on species highly sensible to magnetic cues, like turtles and sharks.

Invasion by exotic species would be enhanced by providing new surfaces for colonizing organisms. In addition a new type of "habitat" would be present since mills also provide very shallow substrates currently lacking in the banks.

In the absence of appropriate initiatives, the resulting output is a substantial risk of erosion of the local biodiversity through alteration of the pristine communties, loss of the spawning potential of local sub-populations potentially important in sustaining some exploited metapopulations and deterioration of fragile habitats and their associated communities.

A possible initiative to hamper biodiversity loss could be the implementation of several small MPAs to protect the particular environments represented by the off-shore banks. This would be analogous to the small protected areas around shipwrecks alrady implemented in Malta. Wind-mill farms could be placed over less sensitive areas, perhaps utilizing existing technologies that allow to fix the mills onto platforms under the sea level, which in turn can be anchored at great depths over more homogeneous and extensive bottom types.

By contrast, if unconventional hydrocarbon exploitation is promoted, a different scenario can be depicted. Exploration has negative impacts in some organisms, notably marine mammals. Since low frequency sound is travel very long distances in the water, the acoustic contamination is expected to cover a vast area. Oil exploitation also has large, diffuse impacts over wide areas through small but continuous leaking of toxic compounds from the facilities. Although a massive spill is possible, the probability of such an even is very low. The impact of diffuse leaking is by far the most important source of hydrocarbon contamination in the sea. Sediments resulted from drilling operations can also release heavy metals and other toxic substances. In addition, facilities and wells takes space from fishing grounds to the industrial fishery. The resulting picture is a large diffuse impact that conflicts with the sustainablity of the local fishery. In the short term acoustic exploration could affect some exploited stocks. In the long term contaminants leaking from facilities could enter the food web and reach the targets of the fishery.

Invasion by exotic species would be promoted by the presence of large facilities over a vast area, acting as stepping stones for species that would find difficult to disperse over large distances in the open sea.

In the absence of appropriate initiatives, the resulting output is a negative effect on the sustainability of industrial fishery through the contraction of fishing gronds, the decrease of the quality (either real or in terms of image) of the marketed products and the increased risk of wide ecological changes.

The implementation of few large MPAs, extending into the high sea, would also preserve a important species from human impacts and ensure some ecosystem goods and services. In the short term this could imply additional losses of fishing grounds for trawlers. In the long term, biological productivity and sustainability of fisheries would be enhanced in the remaining exploited areas. It is however difficult or imossible to avoid the effects of diffuse contamination, particularly through trophic webs. In addition, it is currently unclear if "frozen" concessions could be activated after a MPA would be in place. In fact,

legislation prohibits hydrocarbon exploitation at less than 15 nm from a MPA, but it is not defined what happens if the concession for hydrocarbon exploitation was previous to the implementation of the MPA.

While the reduction of fishing capacity is a fundamental objective in the study area, it should be acompained by actions towards the increase of the maket value of fishing products. The last is specially important for the sustainability of the fishery industry, constrained to reduce fishing effort and thus the total catch. In this perspective, the creation of protected areas to conservate and enhance the environmental quality of the area could provide an added value to the local fishing products if correctly managed. There is some evidence that the adoption of "eco-labels" certificating environmental protection, local origin and sustainable exploitation practiques provides higher market prices to the sold products.

Once scenarios have been chosen they should be developed by identifying the costs (e.g. expenditure, time, effort (one of the factors determining efficiency)), actors, benefits (often expressed in money terms; can also be public's willingness to pay to obtain the impacts of an intervention; something that promotes or enhances well-being; an advantage) and beneficiaries of the alternative scenario in table 7.2 below.

Table 7.2

Present policy: nature conservation and fisheries sustainability	Costs	Actors (bearing the costs)	Benefits	Beneficiaries
Alternative scenario 1: development of wind-mill farms	Lost of biodiversity hot-spots, potential lost of unique habitats and locally important sources of spawners of target species.	Actual society and future generations (in terms of lost of unique biodiversity hot-spots), professional fishermen depending of the target species supported by large local spawners.	Renewable clean energy with little environmental impact beyond the place of deployment of wind-mills.	Actual society and future generations.
Alternative scenario 2: Exploiation of fossil fuels	Contraction of fishing grounds for trawlers.	Actual fisheries (trawlers) and future genreations (in terms of decreased environmental quality through diffuse contamination and increased emission of green-house gases).	Long standing but limited cheap and dirty energy, reduced dependence on the inestable traditional oil and gas suplies.	Actual society.

For each alternative scenario different consequences of policy alternatives (e.g. as result of policy scenario writing); these consequences (or the expected effects) are compared. Finally the identification of any potential conflicts should be carried out. Write a short summary including each of these points for each alternative scenario.

Where there is no local or regional information about future changes, consider global mean future changes as drivers e.g. climate changes.

Having placed the most important adaptive management needs in logical groupings (table 7.2 mini-scenarios), the next action is to work out, very approximately at this stage, what is the connection between them. What does each group of needs represent?
It is advisable to have two complementary scenarios. The reason for this is that it helps avoid managers 'choosing' just one, 'preferred', scenario - and lapsing once more into single-track forecasting (negating the benefits of using 'alternative' scenarios to allow for alternative, uncertain futures). This can be challenging where managers are used to looking for opposites; a good and a bad scenario, say, or an optimistic one versus a pessimistic one. Preferably the two scenarios are required to be equally likely, and between them to cover all the possibilities. Ideally they should not be obvious opposites, which might once again bias their acceptance by users, so the
choice of 'neutral' titles is important.

The main conflicting point inboth scenarios is between conservation and the supply of energy. Conservation is in turn connected to the sustainability of fisheries. The alternative scenarios depict two probable ways for increasing the availability of energy sources. As presently stated, both scenarios identify the local environment (hence the local society) and the fishery industry as loosers. Although traditionally opposite, conservation and fishery needs are on the same side in the face of the external, strong drivers represented by the effects of climate change and energy demands. Conservation and fisheries meets in their effort toward sustainability of economic activities in the ecosystem. Such effort is large since most stocks suffer from a generalized state of overfishing. However, the type of costs, the time scale and the feasibility of specific actions to counterbalance deleterious efects is different between the two scenarios.

Green energy development provokes local environmental impacts that can be largely mitigated by thoughful allocation of the areas where to place generators. The deleterious effects on fisheries sustainability could be curtailed by limiting the access to wind-mill farms and supporting regulations with proper enforcement. High selective, low impacting artisanal techniques could be allowed under proper regulation and control, providing a way to sustain fisheries and to preserve their cultural heritage. The increased risk of deleterious biological invasions is relatively smaller than that associated with the alternative second scenario, since the volume and spread of new substrates would be more limited in the first scenario. The benefits for the local society would be long-standing and would mostly benefit future generations.

Exploitation of fossil fuels prompts diffuse environmental impacts difficult to hamper. The extent of those impacts is potentially the whole Strait of Sicily since ecological processes are connected through oceanographic features operating at the scale of the entire area. The sustainability of fisheries is negatively affected by the reduction of fishing grounds and the possible decrease of the market price of fishing products from deteriorated environments. The implementation of large MPAs to conterbalance these effects is costly (because they would substract large portions of fishing grounds) and difficult to implement (since largely allocated beyond national jurisdictions). The risk of biological invasions giving rise to ecological and economic problems is higher than in the previous scenario. On the positive side, it must be kept in mind that the strategic interest for fossil fuels is high, since energy supply is a fundamental aspect for economic development and traditional fuel suppliers are expensive and unstable. The benefits for the local society are thus immediate albeit limited in time, through increased availability

of valuable, cheap, contaminant energy sources. Long-standing negative effects would be mostly beared by future generations in terms of deteriorated environmental quality and accelerated climate change.

Action 7.3: Recommend improvements in management strategies

Select the preferred alternative policy scenario from table 7.2 above. This scenario can be used to identify and select the management measures.
Input is needed which has been collected from step 5 and 6 and also from the governance work package (WP6). Table 7.3.1 shows the information that is needed and where it can be found in the manual or through other work packages:

Table 7.3.1

Input	Where it can be found
The level of success of operational objectives	Table 5.2
Gaps which indicate that objectives are not met	Tables 5.1.1 – 5.1.3
Were indicators appropriate for assessment?	Table 5.3
How failure is explained	Report from step 6.2
Effectiveness of different governance approaches	Governance analysis (WP6)
Equity, knowledges, power and other related concerns for governance	Governance analysis (WP6)
Balance and difference between local and high level objectives	Governance analysis (WP6)

Using this information, the output of steps 5 and 6 are essential input for the identification and proposition of management improvements. In addition the outcome of the governance analysis gives us relevant information for formulating recommendations in management, monitoring and/or participation strategies. If we have some idea of 'dominance or orientation' of institutions in a SMA then we may be able to formulate recommendations for improvement, if management, monitoring and/or participation strategies prove to be ineffective.

To make recommendations for an improved strategy, the questions in table 7.3.2 should be answered using the information indicated above:

Table 7.3.2

Question	Answer
Which institutions are 'dominant' in the SMA, based on the described and analysed institutional landscape?	The national government, through the ministries for the economic development and the environment, dominates the management of national waters through a top-down approach based on regulations.
What management improvements are needed, management strategy, monitoring strategy, participation strategy, or a combination?	Bottom-up participative management, giving voice and decisional capacity to local authorities and skateholders, is urgently needed if the necessary measures should be accepted by the local society. This type of approach is being recently promoted through the creation of local management authorities for fisheries (CoGePa). It is needed to enlarge the approach to a multi-sector stakeholder spectrum. Subsequently, a condivised and transparent management strategy with clear targets regularly monitored should be negotiated and adopted.
What choices must be made in improving management, monitoring strategy – or both – given the described and analysed institutional landscape?	(1) To improve scientific evidence; (2) to make information widely available; (3) to improve coordination among overlapping (and sometimes conflicting) authorities; (4) to suport actions through effective enforcement; (5) to provide early stakeholder engagement; and (6) to enhance transparency of the management process.
Which adjustments must be made in objectives to implement the new management strategy	Objectives for nature conservation should be better defined through providing specific targets and deadlines. Objectives for fisheries sustainability should include specific references to the preservation of the cultural heritage held by fishermen.
How can the adjusted objectives be balanced between local and EU policy frameworks and their objectives?	Local policy frameworks are usually produced without public participation. Moreover, the lack of information promotes public unawareness of the importance of the objectives. Therefore, local policies objectives are defined under the pressure of a public opinion that is contrary to further impositions because unaware of the necessity of the actions and the importance of the high level policy goals. Proper information and

	participation are therefore essential. While participation is currently being improved through the creation of local management authorities for fisheries, information is still lacking.
Which adjustments must be made in indicators to implement the new monitoring strategy?	A regular time basis for monitoring and evaluation of indicators is needed in fisheries management plans. Management plans and the related indicators are still lacking for conservation initiatives.
How can the adjusted indicators be balanced with indicators in EU-policy frameworks?	
Which adjustments must be made in the involvement of stakeholders to implement the new participation strategy?	Stakeholders should be called to give their views and needs early in the management cycle, instead of being passive observators of the already finished management plans produced without their direct implication.
What are the institutions that need to be changed or developed to support the implementation of the recommended strategies?	The actual institutions should be linked and harmonised transversally in order to be more effective. Local governance institutions need to be developed in order to balance the current top-down management approach. Institution endorsed with enforcement are numerous, overlapping and generally inefficient.
What are the implications for policy development and reform at the EU level?	EU policies are already oriented to the public participation in the management and should continue in that direction. However, it is important to realize that, in order to be efective, public participation must be properly informed in an abjective way. Otherwise, the local societies became the instrument of strong stakeholders that monopolize the decision-making procedure. It is an error to assume that ideas that appear clear to EU policy-makers will be so when translated in a different context with very different traditions and cultural models. Without the proper awareness and vision, disinformed public obstacolate management and the local societies will not accept regulations exclusively made of prohibitions.
How can the adjusted involvement of stakeholders be balanced with the (required) stakeholder involvement in EU-policy frameworks?	Stakeholders are currently called to passively observe the output of a quite opaque decision-making process. The sucesful implementation of EU policies calls for the (1) proper information of

	the public; (2) early engagement of stakeholders; and (3) actions in support of local societies.
What does the improved overall strategy – management, monitoring and participation – look like and how can it be monitored and evaluated?	An improved overall strategy passes throug an unified management plan, which is currently lacking. In such a plan, information availability to the public, early participation of stakeholders and transparency through the management process are essential. In addition, due to the large area covered by the high sea and the functional interconnections at large spatial scales, the participative inclussion of countries on the African coast of the Strait of Sicily (Tunisia and Lybia) should be of great importance.

Local policy is aimed to short-termed objectives that can be colectivelly summarized as trying to make happy everyone, traditionally through subsides. Such approach has promoted a culture opposite to the responsability called for bearing the efforts needed to attain the high level goals of the EU policies, namely sustainable management of human activities in healthy ecosystems.

Finally, use the answers in table 7.3.2 to fill out table 7.3.3 to conclude on the suggested improvements to management, monitoring and participation strategy through adjusted objectives, indicators and stakeholder involvement (this information will link back in to the governance analysis).

Table 7.3.3

Alternative scenario:		
Improvements in...	Changes in...	What are the changes...?
Management strategy	Natural objectives	Define operational objectives
	Human objectives	Define operational objectives to preserve the cultural heritage of the fishery sector
Monitoring strategy	Natural indicators	Define baselines, targets, monitoring programs and deadlines
	Human indicators	Define the time basis for monitoring and evaluation
Governance	Institutions and governance approaches	Governance institutions should be transversally linked and harmonised. Bottom-up governance approaches should be promoted.
Participation strategy	Intensity and diversity of stakeholder involvement	Information of the public society is an essential pre-requisite. Wide stakeholder involvement should be promoted at early stages of the management cycle.
Combination of management, monitoring or participation strategy	Mixed adjustments	Coordination among different management bodies and transparency in the management

		process must be greatly enhanced.

Action 7.4: Internal orientation: reality check for improvement in management measures

An internal orientation poses the question 'Are the improvements realistic?' Therefore evaluating the adequateness of the new objectives. This question will be addressed through the governance analysis in WP6.

Objectives inspired or related to the CFP are to be met by 2013. Although there is evidence to suspect that some or many objectives will be not matched by that date, such deadline was maintained in the operational objectives to remain in line with the CFP.

Objectives related to the marine Strategy Framework Directive and the new EU Biodiversity Strategy are ambitious, yet it is unclear if can be achieved within 2020 due to the lack of sound scientific knowledge about the status of the Strait of Sicily and the intensity of the pressures exerted by human activities in the area. The 2020 deadline was maintained in te operational objectives in order to align them with the reference policies.

Governance analysis

Action 7.5: External orientation: Relation with the EU policy framework

In order to make sure that an alternative policy scenario is in line with the relevant EU policy framework, it has to be checked against relevant policies. Some policies of general importance at EU level are, the Marine Strategy Framework Directive, Water Framework Directive, Common Fisheries Policy and the Habitats Directive. Relevant regional, national and local policies should also be taken into consideration.

- Identify relevant policies using information from step 1b and other available or new sources and list them in the table 7.5 below.

The EU inspiring policies of the identified operational objectives were the Common Fisheries Policy, the Marine Strategy Framework Directive as well as the Habitats and Birds Directives. In addition, the EU 2020 Biodiversity Strategy is a new standing reference, being the upcoming EU Strategy on Invasive Alien Species of main importance in the context of climate change. The Water Framework Directive, while being relevant, was not taken into consideration given the small fraction of coastal waters in the Strait of Sicily. Regarding conservation, the most important Italian framework is the Act 979. For fisheries, the EU reformed Common Fisheries Polocy found proper transcription in the Italian National Opetive Plan and the Strategic Operative Program.

- Fill in new operational objectives and management measures (according to recommendations from table 7.3.3) in the checklist and describe the links between each new aspect and policy.

Since operational objectives were partially or totally derived from high level documents (policies and laws) they already incorporate some of the recommendations made in table 7.3.3, like the definition of some indicators and deadlines. In particular:

[Der1] Substantial reduction (say 20%) and rationale spatial allocation of fishing effort by 2013.

[Der2] Financial viability and safe working conditions for fishermen by 2013.

[Der3] Nature conservation, environmental protection, and substantial reduction (say 20 %) of loss of specific biodiversity components (species richness, taxonomic structure, population genetics, architecture of trophic webs, ecosystem functionality, landscape integrity…) by 2020.

[Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability within a given date.

[Der5] Preservation of specific issues regarding the cultural heritage (say artisanal fisheries) within a given date.

Additionally, oprational objectives should include the following:

Definition of habitats and species that deserve protection in the Strait of Sicily, for example through the adoption of the RAC-SPA set of different criteria for the Mediterranean region.

Definition of a regular monitoring program, e.g. onto annual or seasonal bases, to establish the baselines of the habitats and species identified.

Definition of specific actions, targets and deadlines in line with the temporal duration of the reference policies (2013 for the CFP; 2020 for the MSFD as well as the EU Biodiversity Policy).

Specific measures aimed to guarantee that governance institutions become linked and harmonised, e.g.through transversal steering comitees, in order to enhance coordination.

Specific measures to ensure transparency, e.g. by providing ample publicity to decisional processes, regular reporting of the progress that should become rapidly and easily accessible by public.

Specific measures for the promotion of bottom-up governance approaches through public awareness of the importance and necessity of management goals, e.g. by providing informative mesages through the public and private communication mass media. Subsequently, a wide spectrum of stakeholders should be officially invited to participate in those processes since early stages.

- Check whether the new operational objectives and management measures are in line with relevant policies or not. If not, explain why and fill in the changes that have to be made.

In the absence of an integrated management plan, operational objectives were derived from policies and laws of application in Italy. In doing so, such objectives were already quite in line with the relevant policies at European and national levels. A new redefinition of operational objectives is provided after additional insight was gained through step 7.

Table 7.5:

New operational objective and management measure from alternative policy scenario	Relevant policy (nubers link to tables 1b.1 and 1b.2 for relevant policies and laws)	Level (EU, regional, national or local)	Describe link of new aspect to relevant policy.	Check if new aspect is in line with relevant policy. If not, explain changes that have to be made.
[New Der1] Substantial reduction (20% on average) and rational spatial allocation of fishing effort into low sensitive habitats up to a maximum of the 80% of the territory, through annual monitoring of progress until 2013	1, 2, 3, 4, 5, 6, 7, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 92, 106, 108, 110, 111c, 116, 116b, 118, 145, 181, 189b, 195, 200, 200b, 201, 212, 235, 236	Global, regional, European, national and local	Reduction and rationalization of fishing effort	In line
[New Der2] Financial viability and safe working conditions for fishermen (as indicated by socio-economical indicators provided in 1-7) through annual monitoring of progress until 2013	1, 2, 3, 4, 5, 7, 63, 97, 134, 104, 106, 108, 111, 111c, 112, 112b, 113, 118, 122b, 127, 133, 138b, 138c, 140b, 145, 147c, 181, 182, 183, 188c, 189, 200, 200b, 201, 212, 212, 224, 229, 229b, 235, 236	European, regional, national and local	Healthy working conditions for crews. Adequate incomes for fishermen and economic viability of fisheries	In line
[New Der3] Nature conservation (in particular relevant habitats and species identified under proper criteria), environmental protection, and substantial reduction (20 % on average) of loss of specific biodiversity components (species richness, spread of exotic species, ecosystem integrity and functionality) through annual monitoring of progress until 2020	60, 61, 63, 63, 66, 67, 68, 69, 70, 84, 85, 86, 86b, 87, 89, 90, 91, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103a, 103b, 104, 105, 107, 109, 109b, 111b, 111c, 114, 115b, 115d, 117, 119, 121, 122, 122b, 123, 125, 125b, 125c, 129, 130, 131, 132b, 134, 134c, 134d, 134e, 134f, 137c, 137d, 137e, 138,	Global, regional, European, national and local	Conservation of relevant habitats and species, environmental protection, ecosysytem restoration, prevention of spread of (usually exotic) harmful organisms	In line

	138b, 138c, 138c, 138c, 138c, 140, 140b, 141, 141b, 142, 142b, 142c, 143, 143, 143b, 144, 144b, 146, 147, 147b, 147c, 149, 150, 151, 152, 153, 154, 155, 156, 158, 159, 160, 161, 162, 163, 164, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 182, 183, 184, 185, 186, 187, 188, 190, 191, 193, 194, 196, 197, 198, 199, 202, 203, 204, 205, 206, 208, 210, 213, 214, 217, 219, 220, 221, 222, 223, 225, 226, 227, 228, 231, 232, 239			
[New Der4] Sustainable exploitation of natural resources in the face of uncertainty, multiple cumulative impacts, genetic drift and environmental variability through annual monitoring of progress until 2013	2, 3, 4, 5, 7, 66, 70, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 89, 91, 92, 93, 96, 97, 102, 103b, 104, 105, 106, 108, 109, 109b, 111c, 115a, 116, 116b, 117, 118, 120, 122, 123, 124, 126, 127, 133, 134b, 134c, 134f, 135, 136, 137, 137f, 137e, 138b, 138c, 139, 145, 148, 149, 157, 166, 168, 179, 180, 181, 182, 183,	Global, regional, European, national and local	Sustainable exploitation of resources (mainly stocks but also biodiversity and minerals)	Not in line. Current policies on the exploitation stocks are aimed to reach the Maximum Sustainable Yield (MSY) instead of the Optimum Sustainable Yield (OSY). Under recognized uncertainty and the precautionary principle, OSY is closer to real sustainability than MSY

	185c, 185d, 185e, 188b, 191b, 193b, 195, , 198, 200, 200b, 201, 207, 209, 212, 212, 215, 216, 218, 229, 234, 235, 236			
[New Der5] Preservation of specific issues regarding the cultural heritage (changing technologies and artisanal techniques) through annual monitoring of progress until 2013	101, 150, 183, 188c	Regional, European, national and local	Conservation of cultural values	In line
[New Der 6] Promotion of coordination of governance institutions, by means of transversal steering boards ensuring inter-linkage and harmonization of criteria and actions, through annual monitoring of progress until 2013	Reformed Common Fisheries Policy, 192	European and national	Coordinated representation and negotiation in international for a. Passage of competences from the national government to local ones	Partially in line but significant achievements are still lacking
[New Der 7] Ensuring transparency in decisional processes, by providing ample publicity to resolutions to be taken and easy, free access to reports on the adopted outcomes, through annual monitoring of progress until 2013	NA	NA	NA	Not in line. There is a strong cultural opposition to transparency. On one hand, local administrations are traditionally opaque in their decisions. On the other hand, many citizens are diffident about administrative bodies. Significant efforts have to be made to address this issue in the Strait of Sicily, for example but not limited to the systematic adoption of the proposed measures

[New Der 8] Promotion of bottom-up governance approaches and public awareness, by means of objectively informing the public using effective communication ways, and by inviting a wide spectrum of stakeholders to participate in management processes from early stages. Deadlines taken from reference policies (2013 for the CFP and 2020 for the MSFD and the Biodiversity Policy)	NA	NA	NA	Not in line. Participative involvement of stakeholders has seldom been the rule in the Strait of Sicily, where traditional governance structures are strongly hierarchical. Where adopted, participation has been usually limited to the illustration of already adopted measures to stakeholders. Significant efforts have to be made to address this issue in the Strait of Sicily, for example but not limited to the systematic adoption of the proposed measures

Action 7.6: Write a report on adaptive management needs for the SMA

Depending on whether a spatial management plan is in place or not, this action will create a report on adaptations of an existing management plan or write recommendations for a new management plan. Using the results from the actions 7.1 – 7.5, write a report including:

- Identified desired future condition.
- Chosen policy scenario (from 7.2). The preferred scenario should consider the long-term policy objectives.
- Prioritized recommendations (from 7.3)
- A timeline with actions and a description of development stages

The report should be written in a clear language with clear recommendations following the template below.

Report on adaptive management needs for the Strait of Sicily
Results from partial application of generic MESMA framework.

SMA Strait of Sicily, Central Mediterranean
Author Tomás Vega Fernández
Institution CNR-IAMC
Date 12/12/2011

Current state of spatial management in SMA (tick boxes when complete):

x recommendations for a new management plan

x recommendations for adaptations of an existing management plan

□ if there are no existing gaps or drawbacks in current management, no recommendations are needed. Current management will be continued.

Report on the results from actions 7.1 – 7.5

- Identified desired future condition

The desidered status in that of healthy, productive ecosystems able to support a wide array of human uses and economic activities in a sustainable way. The Strait of Sicily is already a very productive system in the Mediterranean context, due to unique oceanographic features. The ecological status is good albeit not pristine in most of the area. Sustainability of industrial fisheries is not feasible as many stocks are already overfished and conservation efforts have to be undertaken in order to preserve ecosystems structure and function in the face of new drivers. The natural and cultural heritages are huge but largely neglected.

- Description of the preferred policy scenario (choose from table 7.2), it should consider the long-term policy objectives.

The scenario promoting wind energy exploitation is to be preferred over the one based on the exploitation of fossil fuel deposits because it was found to be in line with long-term objectives of reference policies like the Marine Strategy Framework Directive and the 2020 Biodiversity Policy. Moreover, the exploitation of eolian energy creates less conflicts with other important sectors like fisheries and tourism. In addition, conflicting issues with conservation needs can be partially hampered because some mitigating measures are technologically feasible. It is important to stress that, in the short term, exploitation of fossil fuels is more appealing under different points of view. For example the economic income is probably higher, the power to produce energy is larger giving rise to strategic importance, and environmental concerns are not readily detectable in the short term.

- Prioritized recommendations for improvements in management strategies (from action 7.3, new assessments, new decisions, and/or new implementation).

Large scale, effective policies to change the current patterns of energy use are essential to attain sustainability. Such policies are lacking or ineffective in the Strait of Sicily.

Communication and coordination among the numerous administrative bodies is needed in order to avoid overlapping of competences and contrasting measures.

Participative governance structures are urgently needed to avoid unilateral overriding of decision-making by any single strong stakeholder. Ample diffusion of objective information, early involvement of stakeholders and enhancement of transparency is essential to promote bottom-up governance initiatives.

Rational re-allocation of human activities in space and time within the area would greatly improve the integrity of ecosystems as well as the sustainability of human activities and economic activities.

Regarding conservation, it is urgently needed to pass from imposed restrictive regulations to participative management plans. Enforcement should be ensured during such transitional phase.

Regarding fisheries, a contraction of the fishing effort is needed in order to ensure sustainability of the stocks. To provide economic sustainability, the market price of fish products could be raised. This can be achieved through a number of initiatives oriented to highlight the naturalness of the local products, the high health status of the fishing areas, the nutritional value of the products and the adoption of “eco-

labels" certifying low impact and sustainability of the fishery procedures. Even trawl fishing, which is by far the more impacting fishing activity in the area, could be made more "green" e.g. by adopting devices to lower by-catches and modifying gears to made them more selective. This means a change in the current vision focused on quantity towards quality.

Scientific knowledge need to be improved and regular monitoring programs must be implemented to make possible the evaluation of the trends in the attainment of the management objectives.

- Evaluation of the level of implementation of EBM, by relation of the objectives to the criteria of EBM.

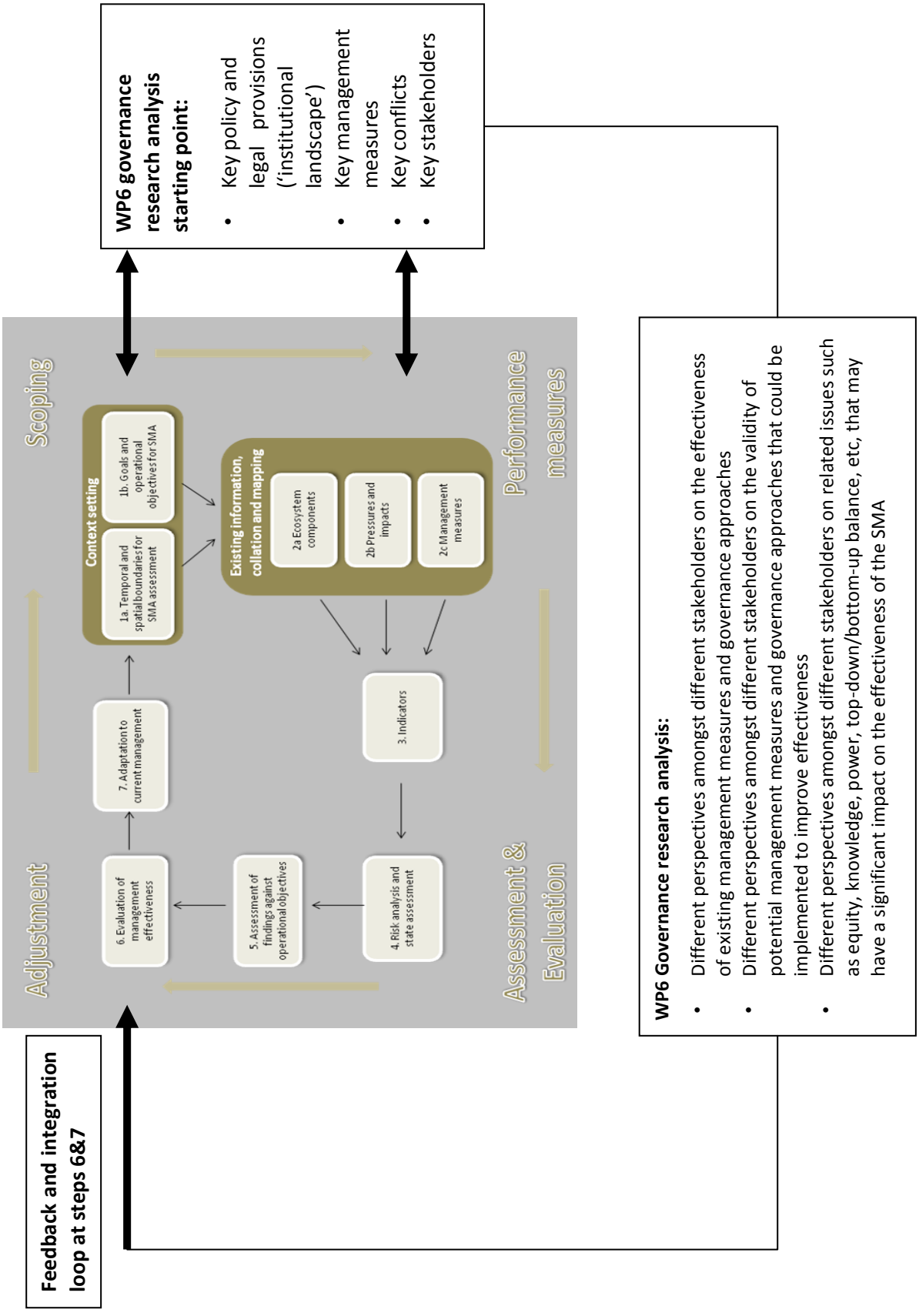
The practical implementation of EB principles is largely absent in the Strait of Sicily. Importantly, the necessary conditions for EBM (e.g. public awareness and acceptance) are even lacking in many cases. Malta has already started ICZM initiatives, which places this country in a better position to implement EBM with respect to Italy in the area.

It is worth of note that the Strait of Sicily is a unified and dynamical system at an oceanographical mesoscale. This peculiarity make necessary the involvement of non EU coastal countries in the area in order to get EBM. At least Italy, Malta, Tunisia and Lybia should agree in the identification of a common view on the management of the Strait of Sicily, as well as the definition of common guidelines and the coordination of management actions oriented to EBM.

Timeline with actions and a description of development stages.

NA

Appendix 1


WP6 governance research analysis starting point:
Key policy and legal provisions ('institutional landscape')
Key management measures
Key conflicts
Key stakeholders
Scoping
Context setting
1a. Temporal and spatial boundaries for SMA assessment
1b. Goals and operational objectives for SMA
Existing information, collation and mapping
2a Ecosystem components
2b Pressures and impacts
2c Management measures
3. Indicators
4. Risk analysis and state assessment
5. Assessment of findings against operational objectives
6. Evaluation of management effectiveness
7. Adaptation to current management
Adjustment
Assessment & Evaluation
Performance measures
WP6 Governance research analysis:
Different perspectives amongst different stakeholders on the effectiveness of existing management measures and governance approaches
Different perspectives amongst different stakeholders on the validity of potential management measures and governance approaches that could be implemented to improve effectiveness
Different perspectives amongst different stakeholders on related issues such as equity, knowledge, power, top-down/bottom-up balance, etc, that may have a significant impact on the effectiveness of the SMA
Feedback and integration loop at steps 6&7

FEED BACK

Summary.

The framework is generally coherent and successfully organizes the available information in order to make it useful for the aim of MESMA. In summary:

The logics seems robust

The structure is quite good albeit it could be enhanced (see specific comment below)

Some details (e.g. table headers) need redefinition.

General comments.

G1: Time scale. The most evident comment is about time scales. The path to be followed through the framework is defined as a function of both type of available information (flowchart in figure 2 in the manual) and available data quality (within each step). Yet, the factor that overrides the progression through the manual is the accessibility of information and data. Information accessibility imposes the timing as a result of the linear structure of the framework (see figure 1 in the manual). Therefore, the CS idiosyncrasy defines the time needed to complete the work. Information in the SoS CS is characterized by being:

• Abundant (lack of unified vision, lack of integrated management plan).

• Fragmented (different sectors have distinct management plans within the same activity).

• Highly redundant (e.g. different sectoral management plans reflect the same EC directives).

• Contradictory at times (conservation and productivity issues appear often in contrast; e.g. drifting nets, fry fisheries).

• Hard to reach (e-mails and telephone calls do not work in many instances).

• Available through non-standard ways (e.g. knowledge gained from colleagues' friends).

• Expensive (sometimes you need to pay to get public information financed with public funds, in direct -e.g. maps – or indirect ways – e.g. fishing effort-).

Thus the time needed to track, obtain, cross-validate and ensemble information in a coherent way expands to several (too many) months. When summed across several framework steps, the net count is clearly longer than the relatively narrow window provided for this first round of the framework implementation (by the way, this is probably a consequence of splitting the original single implementation in two separate rounds, which was clearly a substantial enhancement).

It is hence suggested to characterize the information of the CS at the beginning of the framework manual, and to define the level of detail in the framework implementation on the basis of such assessment.

G2: Linear vs. network structure. Steps are organized sequentially. This improves clarity and helps understanding the process. However, it makes the whole process slower since not all the information is ready available at the same time. An alternative structure could propose several steps that converge towards the core of the framework at some stage. For example, steps 1, 2 and 3 could start quite independently before going into step 4. This allow you to work on what you recive each day, boosting the process. Of course a "general context setting" must be fixed at the very begining of the work. This could be done in very broad terms regarding the spatial extent, the temporal window and the focused activities.

G3: Dead braches. In some cases we were asked to input information that was no used later. This is possibly the result of several changes made in the framework while developing the manual. Therefore the

"tree" structure of the manual, which progressively collate and summarize the CS information into the framework, contains some detached "dead branches" that go nowhere. These will be detailed below and should be deleted from the manual.

G4: Tables vs. database. MS Word tables are largely user-unfriendly. Importantly, they are poorly suited to manage large amounts of records. Such records share an analogous structure. Hence the best way to cope with this type of information is a database (MS Access, Dbase and the like), hopefully directly linkable to a widely-used GIS. A quick comparison is provided below:

DATABASE	SPREADSHEET	TEXT TABLES
Hyperdimensional structure	Bidimensional structure	Bidimensional structure
Unlimited storing capacity	Large but limited storing capacity	Small storing capacity
Robust and stable	Unrobust but stable	Unstable
Complex to manage	Quite easy to manage	Extremely easy to manage
Facilitated input (e.g. plates)	Facilitated input (e.g. autofilling)	Slow editing
Easy to perform matrix operations (e.g. summarizing tables)	Basic matrix operations (as columns and rows)	No matrix operations out of the active page
Automatic check for coherence of data structure	Some degree of automatic check of data nature	No check of coherence
Automatic check for typographic errors	No check for typographic errors	No check for typographic errors
Information can be merged in a unique database	Information can be merged to a limited extent	Information can not be merged
Automatic retrieval of selected (ad hoc) data retrieval	Filtering of selected (ad hoc) data if previously planned	No automatic retrieval of data
Export in many formats	Export is some formats	Export usually fail in practique
Can be directly linked to GIS	No direct link to GIS	No direct link to GIS

Since a web geo-portal is already planned in MESMA, it is conceivable to develop an on-line database where information needed to implement the framework can be input from each CS. Such database would be accessible from the geo-portal trough internet and data could be uploaded using templates. Since ALL templates (input data) and reports (output results) are linked to the very same database, it is possible to enable automatic fill-out of such cells asking for information that was already input in the past. Moreover, since linkages between the database and the templates is dynamic, automatic update of templates and reports is ensured every time that a single record is modified. Overall, a dedicated database would represent a slightly more complicated way to edit information but a huge reduction in the time allocated to data input and result output.

1 Context setting

C1.1: General. The context is set from an holistic point of view, but focused on a narrow arrangement of subjects in order to work out this part of the framework. As a result, some mismatching occurs among tables within the step. This was referred as "dead branches" under general comments and it is stessed again in the comments to specific tables.

Step 1a: Set temporal and spatial boundaries for SMA assessment

Action 1a.1: Identifying and mapping of existing management plans

C1.2: Table 1a.1.3. The question above table 1a.1.3 t seems to refer to any sectoral management plan. It should be clearer if the term "sectoral" is included in the description of the table to highlight the difference with table 1a.1.1

C1.3: Table 1a.1.4. It seems that every activity, whatever sector it belongs to, should be listed at this stage. This appear to be in line with the pristine "MESMA philosophy". Yet, it was suggested to focus on a single or a few sectors or activities during the meeting held in Hamburg. Hence the framework gaters many informations as it was holistically conceived but, since the procedure is driven by availability of data and data are taken from selected activities, some information becomes lost on the run (that of the unselected activities). This was referred as "dead branches" in the general comments above. Such dead branches go nowhere, consume time, and appear to be useless. They should be deleted.

Action 1a.2: Identifying and mapping of planned sectoral spatial initiatives

C1.4: GIS layers. It is frequently asked to produce GIS layers as detailed as possible of the spatial scale (please note that the correct term seems to be "extent") of the different sectors. However, many of these sectors are not taken into account in the following steps. Is it really necessary to consider all them in detail? If we focus on a single or few activities, it is probably enough to know about the existence of the rest of the sectors. A simple list would be right here.

C1.5: Choosing the quality of available information. The "poor/no information" option should be placed at the beginning of the action. This allow to skip the action if there are not data, and avoid spending time reading actions that can not be done without proper data.

Action 1a.3: Describing the patterns of activities (existing, in progress and future planned)

C1.6: Pattern. It is unclear the exact meaning of the term "pattern". If it is intended as the spatial position, extent and duration of an activity, then activities have been already described above. Alternatively, it could refer to the pattern of the "remaining" activities (those not already described above for one reason or another). Finally, it could also refer to all the above sectors divided into different activities (e.g. fishing sector divided into demersal, pelagic, etc...). This point should be clarified and perhaps stated more esplicitly.

C1.7: GIS layers. GIS layers are required but at this point is still unclear why. Knowing the finality a priori (e.g. being used to compute cumulative pressures and impacts on the natural ecosystem components under step 2) would help to take critical decisions like type of layer, type of data, spatial extent and grid resolution.

C1.8: Importance. What should be the criterion applied to assess if a given activity is important or not? Is this information really relevant? If it is, then the reader should be summarily informed about the aim in order to choose appropriate criteria. If it is not, then the header should be deleted.

C1.9: Table. What table should be used, Table 1a.3 in the manual or 1a.1.2 in the Bay of Biscay example?

Action 1a.4: Identifying and mapping of institutional landscapes

C1.10: Edition of governance elements. The elements of the institutional landscape can be defined through a table or in a list. What is the most convenient way to do this? This should be decided keeping in mind the specific requirements of the governance analysis, in order to avoid duplication of the work.

C1.11: Identification of governance elements relevant to the institutional landscape. It is known from WP6 that, for example, legal obbligations and stakeholders are among those elements. However, it is still unclear how to identify relevant legal obbligations and stakeholders, since such decisions depend on objectives defined later (from management plans). E.g., socio-economic objectives should be related to a number of elements quite different from those related to conservation objectives. Thus the resulting institutional landscape will vary accordingly.

C1.12: Correspondence between WP2 and WP6 objects of study. At this point, it could be important to highlight that WP6 governance research will focus on MPAs, while WP2 focus on activities choosed without any constraint (like be present within MPAs or not). It could be the case that the some elements of the WP2 framework can not benefit from the WP6 governance analysis. This could result in a lack of the stated parallelism between the flow of both WPs. A possible example is trawl fishing, which is not allowed within MPAs but is one of the most important activities in our study area. Recall tables sent by Kate and Marijn about this issue.

Action 1a.5: Finalising the temporal and spatial boundary for your SMA

C1.13: Criteria for spatial boundaries. Spatial boundaries were based on a well defined region in geographic, oceanographic and ecological terms. However, it could be defined with different criteria like data availability, national jurisdiction, focused activity or activities, or other. Criteria could be derived from a broad "context setting" at the very begining of the framework, that could also be transversal to several steps (see G2).

C1.14: Criteria for temporal boundaries. Temporal boundaries are generally absent from the documents retrieved in our case study. This could reflect the fact that we heavily rely on legislation rather than management plans. Even in the second case, many plans lack well defined temporal boundaries. Here, we assumed the time boundaries of the inspiring legal documents like the CFP and MSFD.

Step 1b: Goals and operational objectives for SMA

C1.15: Criteria to define goals and operational objectives. Most of the activities present in our study area lack any management plan, either existing or proposed. Therefore broad objectives where distilled from upper level literature (mainly legislation). Even taken a representative (through cross-validation) sample, thwork is very time-consuming (note the number of records!). Is there any way to perform this task more quickly? (See also G1).

C1.16: Criteria to define goals and operational objectives. Distilling the goals and operational objectives from upper level literature implies a good amount of subjective interpretation, becouse some of the characteristics outlined in G1 (like conflicting or contradictory sources). Analogous to the question stated above, is there any way to perform this task objectively? Otherwise there would be a large component of "unexplained" variation among some case studies, which negatively influences the value of the framework as a broadly applicable tool.

C1.16: Unforeseen conflicts. Some problems could be new, or they become important only recently. As a result, appropriate management plans would be lacking, specially in those places where top-down management is the role. In its current form, the framework would be unable to take into account such failure. This consideration can help in the definition of the temporal boundaries. E.g.: How much time is needed to allow management plans (or regulations, or legislation) to cope with new problems in the study area?.

Action 1b.1: Identifying existing or proposed management plan and its goals

C1.17: Tables unfitted to our CS. Information regarding our CS can not be accomodated in table 1b.1.1 because there is not any integrated management plan for the whole study area, neither in table 1b.1.2 because the sectoral management plans are being evaluated. What we will need is a single table were

putting all sectoral plans regarding the selected activities that are being evaluated. This will be a modified version of table 1b.1.2.