



Baseline study of the Nostra Project

Final report

Prepared for the Département du Pas-de-Calais and the partners of
the NOSTRA Project



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1 Introduction

1.1 Context of the baseline study

The EU European Straits Initiative (ESI),¹ launched in 2010 and regrouping 15 local authorities bordering eight straits of Europe (see Figure 1), grasped the specificities of straits, highlighting the fact that they combine several characteristics which make them territories with specific geographical features,² and as such share common issues and challenges, notably:

- Straits concentrate multiple issues: transport between the two banks and through the strait, economic development, tourism, protection of the environment (and in particular preservation of biodiversity), maritime safety, etc. The scale of these issues goes beyond the specific area of the strait, as straits are nodal points which have a larger impact than their adjacent territories (e.g. economic development can benefit broad areas; or a decrease of maritime traffic – when tunnels are created – can contribute to reducing air pollution);
- They involve international issues due to their strategic location: international straits constitute crossroads and points of exchange with other countries, and are therefore passageways for immigrants, international maritime transport, etc.

¹ www.europeanstraits.eu

² Presentation of the European Straits Initiative, available at:
http://ec.europa.eu/maritimeaffairs/mk2020_consultation/uploaded_files/74.pdf

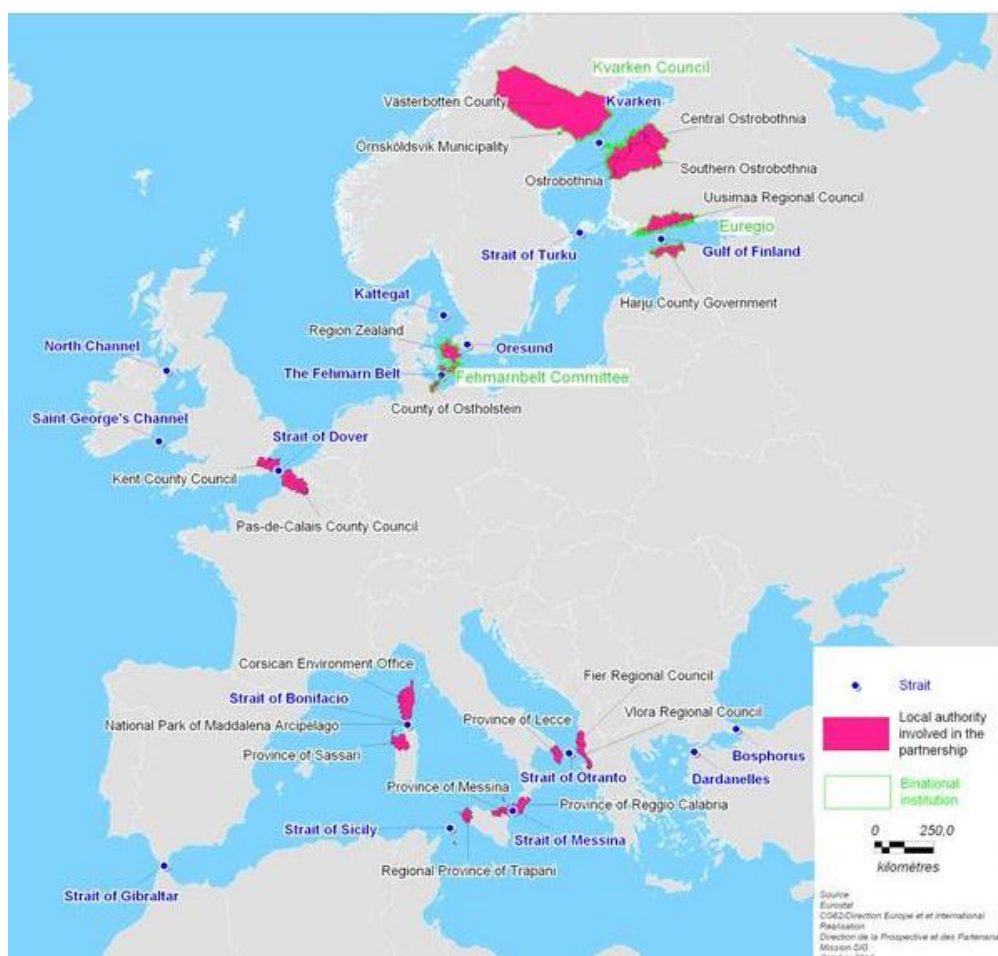


Figure 1: European straits, with mention of straits included in the European Straits Initiative³

European straits are geographical peculiarities, which make them not only centers of human activities but also put at threat their often highly diverse ecosystems and natural environment. Their sustainable development thus calls for integrated management approaches, at an ecosystem level including marine areas and hinterland, and across the different sides of the strait. However, given their administrative, political and cultural divisions, the governance of these areas is often complex, involving multiple levels and responsibilities. This can sometimes lead to overlaps, inefficiencies or leave gaps in the governance.

In 2012, the NOSTRA project was launched. Under the request of the Chair of the Pas-de-Calais County Council, a baseline study was launched during Summer 2013 to support the Phase 2 of the NOSTRA project.

1.2 Objectives

The aim of the baseline study is to provide a summary of the current state of knowledge, experience, issues and requirements in terms of a sustainable management of European straits, and in particular biodiversity management and governance. By taking stock of the knowledge, issues and existing efforts in all the straits involved in the NOSTRA project and by assessing the biodiversity value and its governance, the expected outcomes are to define strategic directions towards a more integrated management of biodiversity and natural environment in these straits. In the study, a total of 8 European straits within the NOSTRA network have been involved,

³ Source: ESI, <http://www.europeanstraits.eu/>

including Dover Strait, Bonifacio strait, Messina Strait, Sicily Strait, Otranto Strait, Gulf of Finland, Fehmarn Belt, and Kvarken Strait.

1.3 Approach

1.3.1 Overview of the general approach of the baseline study

The baseline study has been carefully designed by the project team, upon the agreement with the Pas-de Calais Country Council, and with the support of all participating NOSTRA partners. In particular, the study was carried out with the following six steps:

Step 1: Building the toolkit based on preliminary questionnaire and interviews

During the first step of the baseline study, the project team first carried out a telephone interview with the NOSTRA partners using a preliminary questionnaire intended to collect initial information regarding the specificities of each strait. This information served as the basis for the design and construction of an analytical toolkit.

The toolkit was built to process with the data inputs from individual straits and with the objective to produce results in a systematic manner to allow for individual analysis at the Strait level and for comparison across straits.

Step 2: Support to the partners to collect data – understand the toolkit – visit to the strait

Following the dissemination of the preliminary version of the toolkit, the project team sent out consultants to visit all straits in order to provide local partners with technical guidance on how to use the toolkit and identify the data gaps that will need to be collected in order to assure the proper functioning of the toolkit. This on-site visit helped the project team to better understand the various local situations and to improve some features of the toolkit. In turn, some theoretical concepts were further explained to the local partners so that they could also better understand the needs of the toolkit and send inquiry to other relevant agencies for data collection.

Step 3: Revision of the toolkit

Based on the outcome of Step 2, the toolkit was further revised and results generated by the toolkit were used directly for the analysis of some important features of the straits. The detailed description of methodology on how to evaluate the economic, ecological and governance of the straits is presented in the following section.

Step 4: Complementary interviews and contacts to collect data; literature review

In order to cope with the difficulties faced the partners to collect data and to inform the toolkit, a complementary literature review was carried out by the project team. Based on the literature desk review, together with the information provided by NOSTRA partners, the project team was able to fill some of the remaining data gaps in the toolkit. However, in some cases, required data could not be found during the course of the project. Unfortunately, it was not possible to complete totally the toolkit for the majority of the straits.

Step 5: Analysis at Strait level, definition of recommendations at Strait level and elaboration of individual reports

During this step, all information collected from both toolkit and complementary literature review was documented in the form of individual reports dedicated to all NOSTRA straits. In each strait report, the current economic, biological and governance in the area were presented. Furthermore, recommendations were elaborated and tailored at strait level. Since the results issued from the toolkit were not obtained for every strait, due to the lack of information, it was decided in collaboration with the Pas de Calais Council not to present such results in the individual reports.

Step 6: Transversal analysis at partnership level and elaboration of transversal recommendations

A transversal analysis was conducted to provide comparable results across the straits and to help draw lessons from each other. Furthermore, recommendations were further elaborated at three different levels, i.e. the partnership (NOSTRA) level, Strait level, and side level, in order to identify some possible action plans that could be useful for improving the integrated biodiversity management planning in the European straits of NOSTRA. The present report is a result of such work.

1.3.2 Focus on the key elements of the approach

This section provides a detailed explanation on the methodological approaches being defined and used in the development of the toolkit (Step 1-3) and in the analysis of the situation of the Straits during this study.

Establishing the causal-relationship between pressures exerted on biodiversity and natural environment and their impacts on nature and human welfare

In the present study, the DPSIR (denotes **Driving forces-Pressure-State-Impact-Response**) framework was adapted and used in order to facilitate a systematic analysis of the *status quo* state of the marine and coastal environment in each of the European straits within the NOSTRA project. It guided the project team in collecting data from economics, social, natural and environmental science for each DPSIR component in order to: 1) better understand the causal-relationships between the pressures exerted by human activities as well as natural pressures and their impacts on marine and coastal ecosystems and ultimately on human welfare; 2) identify the existing management and governance structures involved in biodiversity management; 3) identify the responses to these pressures and resulting changes and impacts.

In general, the direct **drivers** of the ecosystem degradation are anthropogenic activities, including maritime economic activities, tourism activities, agricultural production, industrial activities, and so on.

These economic activities can have long-term impacts on the socio-economic and environmental development of a strait, as they impose **pressures on natural environment and biodiversity** such as habitat change/ land use change caused by coastal infrastructure, pollution/ nutrient enrichment due to discarding non-target fish into the sea, overexploitation of natural resources (fish, oil, gas), invasive alien species (IAS) due to maritime transport, and ecosystem functioning changes due to the accumulated damages on marine and coastal

ecosystems. Moreover, the potential impact of climate change on marine and coastal ecosystems also pose a danger, as it can impose other pressures such as sea level rise, increase of water temperature, or acidification, which may have far reaching damages on the ecosystem functioning and therefore have long-term socio-economic impacts.

In this study, these pressures were translated into concrete terms, in terms of the changes of **the state** of environment, including declining fish stocks (e.g. total landings can be used as an indicator to express the decline of fish stocks over years), eutrophication and algae blooming in the sea water, as well as a significant decline of other directly or indirectly affected ecosystem services, such as cultural and recreational use of marine and coastal ecosystems.

Responses present a set of societal and policy makers' prioritisations aiming at reducing the undesired impacts as much as possible by affecting any part of the chain between drivers and impacts. As regards to **the policy response**, the project team reviewed the existing policies, actions and initiatives that have been implemented in these straits at a side level, or as a cross-border action. It identified some key measures and best practices that aim at:

- effectively improving the status of the marine and coastal ecosystems and guarantee the continuous supply of ecosystem services to support the regional economies and human livelihoods, and/or
- supporting a sustainable development of the strait.

Figure 1 above presents an adapted DPSIR framework for the analysis of NOSTRA partners in the framework of the baseline study.

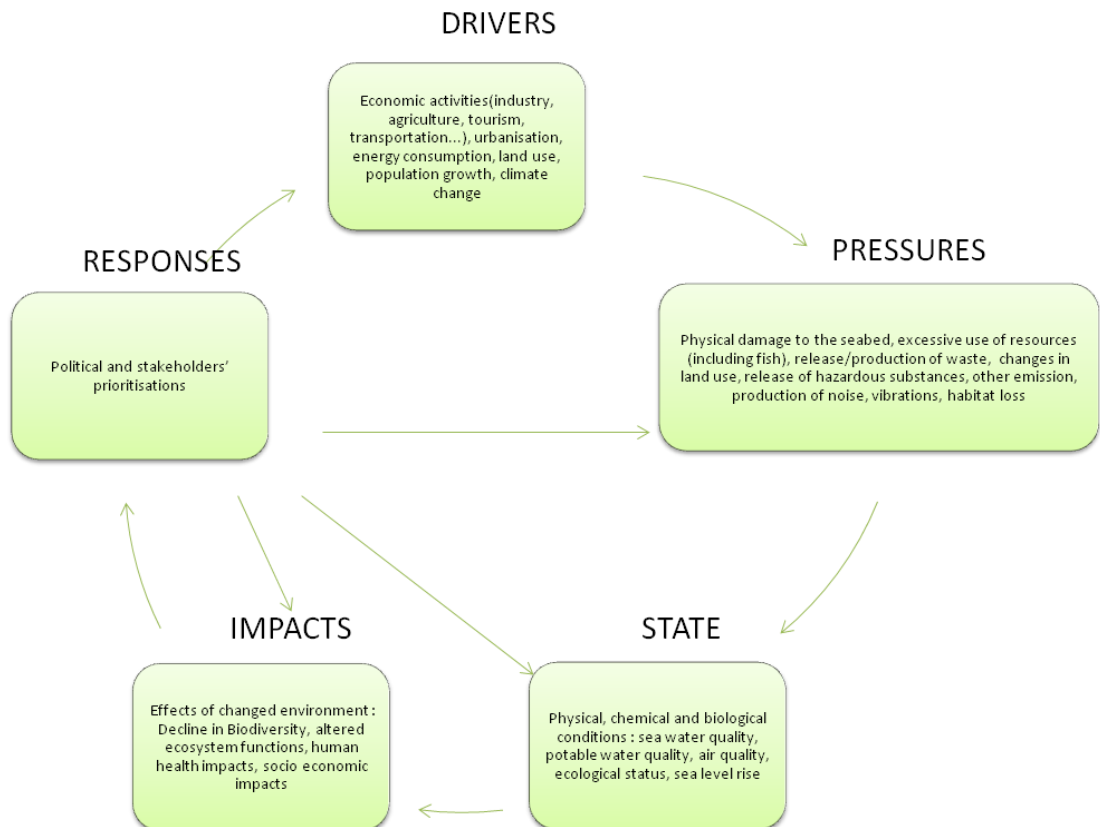


Figure 2: The DPSIR framework (adapted from Sekovski *et al.* (2012))

Identifying main economic activities related to biodiversity and natural environment taking place in the Straits

Economic activities related to production, distribution, exchange and consumption of goods and services can directly affect the welfare of a local population. In Europe, most of the straits are characterised by diversified economic activities, ranging from fishery, farming, tourism, services and manufacture to industry. All these economic activities contribute directly to the local GDP and many provide essential employment opportunities for the local population as well as they contribute to welfare. In the course of the study, **a focus was made on the economic activities that have a potential impact on biodiversity and natural environment, and the ones that rely on biodiversity and natural environment.** Furthermore, for the purpose of this study, a distinction was made to distinguish economic activities that do not extract resources from nature and ecosystem but impose significant pressures on marine and coastal environment, e.g. maritime transport, and economic activities that do rely on the supply of ecosystem goods and services but their use of resources will also have essential environmental impacts, e.g. eco-tourism and fishery. This distinction was important for a better understanding of the relationship between nature and certain economic activities, which in turn will help to specify the impacts of economic activities on nature and to identify the responses that can contribute to a win-win management solution in terms of integrated marine and coastal management in the European straits under consideration.

First of all, based on a telephone interview carried with the key NOSTRA partners between mid-August and September, an exhaustive list of all economic activities taking place in all the European straits was generated – see the table below. At a later stage, the individual straits were requested to identify the types of economic activities that can be found in their strait and provide associated economic data, such as revenues generated and number of employees hired in identified economic sectors. This information is useful for showing the relevant economic importance of these activities in contributing to the regional socio-economic development.

Table 1 Types of economic activity
Maritime transport of goods
Maritime transport of passengers
Ports (fisheries and trade)
Onshore energy production
Onshore production of renewable energy
Onshore industry and infrastructure
Onshore agriculture
Industry
In-land tourism
Maritime tourism

Evaluating the biological significance of the straits

The biological importance of each strait was assessed against a set of complex criteria and attributes that were collected through the toolkit and the literature review, highlighting the significance of remarkable fauna and flora species, identified protected areas under both international and national designations, and remarkable habitats in the Strait. Each of the criteria is further qualified based on a list of attributes. For instance, the significance of remarkable species in the strait is qualified based on whether the species is threatened;

whether the species is protected under international conventions, and/or European designations, and/or national designations, and/or regional designations (if applicable); whether there is the presence of fish spawning and nursery grounds; and whether migratory routes are present. The significance of remarkable habitats in the Strait are qualified based on the number of habitats protected under different European or national legislations (or both). Note that the overlapping of different levels of legislations for protecting some habitats indicates a relatively higher ecological importance of the habitat. Finally, identified protected areas are qualified based on the strictness of the access and the total area.

Evaluating the contribution of ecosystems to local livelihoods

An ecosystem is a dynamic system of plant, animal, and microorganism communities and the nonliving environment interacting as a functional unit. Ecosystem services are the benefits people obtain from ecosystems. The marine environment and the biological diversity contained within the ecosystem provide a stream of goods and services, the continued delivery of which remains essential to our economic prosperity and other aspects of our welfare (e.g. cultural value of ecosystems). The over-arching classification of ecosystem goods and services from the Millennium Ecosystem Assessment⁴ and TEEB (2008) divides them into four categories:

- Provisioning services are the products obtained from the ecosystem;
- Regulating services are the benefits obtained from the regulation of ecosystem processes;
- Cultural services are the non- material benefits people obtain from ecosystems; and
- Supporting or Habitat services are those that are necessary for the production of all other ecosystem services, but usually do not yield direct benefits to humans.

Figure 3 depicts the strength of linkages between categories of ecosystem services and components of human well-being that are commonly encountered, and includes indications of the extent to which it is possible for socioeconomic factors to mediate the linkage (for example, if it is possible to purchase a substitute for a degraded ecosystem service, then there is a high potential for mediation.) The strength of the linkages and the potential for mediation differ in different ecosystems and regions. In addition to the influence of ecosystem services on human well-being depicted here, other factors—including other

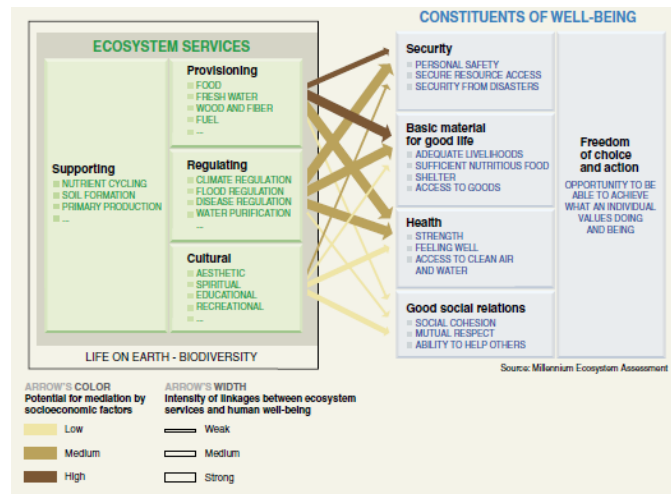


Figure 3 Linkages between Ecosystem Services and Human Well-being Source: MEA, 2005: pp vi

⁴ MEA (2005), Ecosystems and human well-being: synthesis / Millennium Ecosystem Assessment. United Nations.

environmental factors as well as economic, social, technological, and cultural factors—influence human well-being and ecosystems are in turn affected by changes in human well-being.

In the context of the NOSTRA project, the contribution of ecosystem services to local livelihoods is assessed through the toolkit, which is based on an in-depth expert interview on a generic list of ecosystem goods and services presented in the table below and on the literature review. The participating NOSTRA partners were asked to first identify whether the listed ecosystem services exist in their strait and to describe to what extent these specified types of goods and services contribute to the three aspects of local livelihoods, i.e. local economy, cultural and social values.

Table 2. Identification of ecosystem goods and services provided by the Strait

Ecosystem Services (ES)	Type Of Goods and Services Provided in the Strait
Provisioning Services	Examples (definition)
Provisioning services refer to products obtained from ecosystems	Fish
	Agricultural product
	Fossil Fuel (extracted from the offshore platform)
	Natural medicines
	Ornamental resources (e.g. coral reefs or shells)
Regulating Services	Examples (definition)
Regulating services refer to benefits obtained from regulation of ecosystem processes	Climate / Climate change regulation (regulation of greenhouse gases, temperature, precipitation, and other climatic processes; chemical composition of the atmosphere)
	Water regulation (flood prevention, regulating surface water runoff, aquifer recharge etc...)
	Water purification & waste management (e.g. decomposition / capture of nutrients and contaminants, prevention of eutrophication of water bodies etc...)
	Biological regulation (resistance of species invasions; regulating interactions between different trophic levels; preserving functional diversity and interactions)
	Erosion control (maintenance of nutrients and soil cover and preventing negative effects of erosion (e.g. impoverishing of soil, increased sedimentation of water bodies)
	Storm damage control (Preventing / mitigating damage by hurricanes or large waves in coastal zones / along fresh water bodies)
	Regulation of physical and mental human health (regulation of vectors for pathogens, supporting mental and physical health by creating setting for outdoor activities)
	Genetics / species diversity maintenance (Protection of local and endemic breeds and varieties, maintenance of game species gene pool etc.)
Cultural Services	Examples (definition)
Cultural services refer to the nonmaterial benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences	Spiritual and inspirational (personal feelings and well-being)
	Recreational opportunities for tourism and recreational activities
	Aesthetic beauty (appreciation of natural features)
	Educational (opportunities for formal and informal education and training)
	The strait serves as an important World Culture Heritage site

Evaluating responses to pressures

Responses implemented in the Strait (at one-side level or at cross-border level) were classified by fields of actions (ex: seascape, urban planning) and mapped in order to identify how they have targeted and covered the main pressures exerted on biodiversity and natural environment in the strait. This work allows identify the existing gaps in terms of responses to pressures.

Evaluating the current status of cross-border biodiversity management and governance in the strait

Governance in the strait is performed using both formal and informal structures. Based on an in-depth analysis of the current governance of the strait by various stakeholders involved through formal governance structures, formal cooperation networks (such as NOSTRA), and various types of working groups (e.g. between policy makers/business and private sectors/conservation NGOs and civil society interest groups), a governance mapping is produced to report the governance level for 8 different governance aspects under consideration, i.e. decision-making, influencing, management, advisory, communication/awareness, control and evaluation, research and knowledge sharing. In each strait, the NOSTRA partners on both sides of the straits were asked to identify whether the various stakeholders in the straits are performing these governance aspects.

1.4 Opportunities and benefits resulting from the baseline study

The baseline study is one of the first studies that have been carried out for the European Straits of NOSTRA with an ambition of building a complete overview of the situation in terms of territorial development and integrated management of biodiversity. Through the complex and extensive work that has been carried out by the NOSTRA partners and the consultants' team during the baseline study, the NOSTRA partners have had access to some key opportunities:

- Opportunity to collaborate and to develop good relationships internally within a structure (e.g. with other services and departments of their own structure) and externally with partners and stakeholders outside their structure;
- Opportunity to raise awareness of the relevancy of building up this dialogue between the two sides of the strait; and
- Opportunity to collaborate closer and create higher relationship with their cross-border partner of the Strait.

The main benefits the NOSTRA partners could take advantage from the results of the baseline study are:

- At the strait level and at one-side level:
 - Compilation and structured process of socio-economic and environmental data (qualitative and quantitative) and information;
 - Definition of the strait (i.e. geographical boundaries);
 - Transversal analysis of the dynamics between socio-economic drivers, the environmental state, the biodiversity

- and natural environmental significance, the governance in place involved in biodiversity and natural environment;
 - Crossed analysis between the challenges in the field of biodiversity and natural environment and the responses that have been implemented to tackle such challenges;
 - Global perspective of the situation and evolution of the strait;
 - Identification of the gaps in addressing key challenges for the Strait;
 - Recommendations for future actions.
- At the level of the Network:
 - Highlight of similarities and discrepancies between straits and sides;
 - Recommendations for future actions.

1.5 Limitations of the baseline study

Some difficulties rose up at the time the baseline study was carried out. This resulted in a limitation of the initial ambition.

About using the Toolkit and the methodological approach, the main limitations were:

- Language (the deliverables and support documents were in English);
- Difficulty to define a boundary for the economic and environmental analysis;
- Difficulty for the partners to provide a qualitative assessment on some technical topics (e.g. to give a grade on a scale), being not expert on such topics;
- Difficulty to handle specific concepts such as the contribution of ecosystem services to local livelihood. People working in the regional partners / public institutions are not familiar with the concepts;
- Difficulty to collect data and information;
- Lack of available and accessible data;
- Difficulty to carry out the analysis with data coming from different levels and scales (local/regional/national).

About collecting and reporting data and information, the main limitations were:

- The lack of expertise of partners in specific fields (e.g. economics, environmental issues), depending on the responsibilities and fields of expertise and activities of the structure and the background of the contacts;
- Difficulty to receive support from other colleagues/experts internally or externally;

- Lack of availability of the staff (sometimes due to the period of the year: some structures were carrying out other works for the end of physical year);

Facing the lack of collected and reported data, a complementary literature review was undertaken to be able to carry out the analysis. Nonetheless, despite the high level of efforts put by the consultants' team and the partners, data collection was not complete. Furthermore, the outcomes of the study cannot be considered as scientific results. The consultants' team had to base its analysis mostly on qualitative information.

Finally, due to the lack of data and information, the decision was taken with the NOSTRA partners not to carry out the analysis and comparison between the straits by using the analytical graphs issued from the Excel toolkit.

1.6 Recommendations for further work

To continue the work, the main recommendations are the following:

- Ensure a translation of the deliverables in the native language of the NOSTRA partners;
- Decide a specific size/level of analysis, for which data availability and accessibility is ensured, and the same for every strait;
- Limit the number of key data and information to be collected;
- Analyse and compare trends and dynamics, actions and initiatives, but limit the comparison between quantitative data;
- Focus the work on comparing same political measures, and their effectiveness to respond to regional issues;
- Build cooperation with other services and departments within the partner organisation in charge of specific issues; and
- Build cooperation with other institutions and structures in charge of specific fields (scientific knowledge, tourism, macroeconomics, etc.).

2 Outcomes of the baseline study at the level of the Network

Environmental challenges faced by straits are similar to environmental threats and risks to Europe's seas and coasts in general. However, some of these challenges are exacerbated in the case of straits, due to their specificities. They often harbour a remarkable natural capital, which is under threat from the flourishing human activities associated with straits, such as maritime transport and tourism. As such, they require dedicated management actions and protection. This chapter presents the main conclusions of the analysis carried out at the level of the Network.

2.1 Drivers impacting strait ecosystems and natural environment

The preservation and protection of the ecosystems and natural heritage of straits is highly dependent on whether and how the main drivers impacting this natural capital are managed. The key drivers of biodiversity loss in straits include tourism, transport and maritime security and infrastructure development (including land and coastal developments, e.g. in the energy sector); their relationship to biodiversity is briefly explained below.

(The examples given in this section are not exhaustive).

Tourism

Tourism is well-developed in many European strait regions, whether straits are (partially) used as passageways to reach other touristic locations (e.g. the Strait of Dover used to cross the Channel to reach localities in England or France located far from the coast, such as London or Paris), or whether they are targeted as touristic spots for their remarkable landscape or biodiversity (e.g. the Lavezzi Islands in the Strait of Bonifacio).

In many straits, the natural heritage is one of the main touristic attractions of the site. For instance, the Strait of Otranto has some of the cleanest waters in Italy and is home to a considerable diversity of fish. Tourism, partly for fishing, has become an important sector of activity in this strait, with the number of tourists having increased by +54.3% from 2006 to 2010.

However, the regular seasonal presence of tourists may have damaging impacts on the environment, through trampling, littering, artificialisation of seashores or leisure boating pollution. Increased human pressure may ultimately result in loss of value of these areas as a tourist attraction (BIO 2011a)⁵. It is thus critical to find ways to preserve the biodiversity and natural capital in the straits to ensure sustainable – and high value – tourism.

⁵ BIO (2011a), Estimating the economic value of the benefits provided by tourism/recreation and employment supported by Natura 2000.

Transport and maritime security

Maritime traffic is a source of noise and air and water pollution, which causes significant disturbance to marine ecosystems. For instance marine litter is a known source of entanglement and suffocation, chemical pollution can result in physiological disruptions (e.g. disruption of endocrine processes, immuno-depression). Anthropogenic noise may disrupt acoustic communication, mask species display or warning signals, elevate stress levels or even cause irreversible damage; it has so far been associated with reduced densities, reproductive success, survival, and modified species interactions.

Some straits are trying to address these issues. For instance, in the Strait of Bonifacio, the French and Italian authorities have adopted a restrictive approach to navigation, banning French or Italian ships carrying dangerous goods from transiting through the strait. In addition, a ship reporting system has also been established. Likewise, an Adriatic Traffic Report System was created to monitor all ships sailing in and out of the Strait of Otranto.

Nevertheless, the trend towards intensification of maritime traffic and increase in the size of containers will result in additional impacts on the environment. The risk of collision increases together with the increase in maritime transport of people and goods (transport of people is mainly on a north-south axis, while transport of goods is mainly on an east-west axis). The risk of pollution linked to the transport of hazardous goods may also increase. For instance, in the Strait of the Gulf of Finland the transport of oil through the Gulf is expected to rise significantly in the next few years (depending on Russia's progress in port development).

Mitigation options do exist to control or reduce maritime traffic, without impairing the economy; however their associated biodiversity impacts need to be carefully considered. For instance, in the Strait of Fehmarn Belt, which is an important seaway for transport of people and goods between Scandinavia and Northern Europe, Denmark and Germany agreed to build a fixed link (tunnel) to replace the ferry route. The already heavy traffic across the strait is expected to triple once the tunnel opens. Additional changes will include hinterland-rail-connections and a motorway upgrade. These changes are expected to affect the protected areas and natural heritage on-site.⁶

Infrastructures

The economic development of strait regions often goes hand in hand with the construction of large infrastructures. Such infrastructures can be diverse (ports, linear infrastructures, logistic centres, renewable energy infrastructure) but usually have non-neutral impacts on the biodiversity and natural heritage of the strait. For instance in the Strait of Dover, new ports are soon to be opened in order to address the increase in maritime traffic. Thus, London Gateway is a new port on the Essex coast expected to open in 2013. On the French side, developments include the construction of a high capacity liquefied natural gas terminal at the port of Dunkerque, and building of new terminals at Calais.⁷ Such construction has an impact on marine ecosystems and on coastal erosion as they alter marine currents, but also on the

⁶ European Straits Initiatives, Presentation of the Strait of Fehmarn Belt: *“the building of a fixed link in the next 8 years can be a considerable threat to preserving the nature and wildlife on both sides of the strait. When the link opens in 2020 traffic is suspected to rise considerably – especially in form of heavy good lorry traffic and an increasing number of train passages. This constitutes a permanent threat for impact on nature and wildlife in the belt area.”* Available at <http://www.nostraproject.eu/Partnership/Fehmarn-Belt>

⁷ European Straits Initiatives, Presentation of the Strait of Dover, available at: <http://www.nostraproject.eu/Partnership/Dover-Strait>

hinterland, as they result in the destruction or degradations of habitats. Inter-tidal habitats and wetlands are particularly threatened by these developments, and have already suffered net losses over recent years. As the area of natural coastal habitats shrinks, so does the potential for these ecosystems to adapt to changing conditions.

Linear infrastructures can cause the degradation or destruction of vast areas. In the Strait of Otranto, a gas pipeline is planned on being built in order to bring Azerbaijani gas to Italy, and which can have serious repercussions for the environment, tourism and fishing in this biodiversity-rich area (BIO 2011b)⁸. Strategic planning of energy infrastructures, at an early stage can generally reduce the likelihood of unexpected modifications (to respond to EIA requirements for instance) at later stages of the project development. Several opportunities exist to avoid impacts at this early stage, by e.g. using opportunities to upgrade existing energy infrastructures, or using the routes of other infrastructures. But collaboration and participation is key to identifying issues early, imagine innovative solutions, and anticipating issues (BIO 2011b)⁹. Examples of such good practices include the Nordic Logistic Center in the Strait of Kvarken and Botniabanan, and the new Swedish coastal railway.

2.2 Significance of biodiversity and natural environment in straits

Protected areas

Many straits harbour a rich diversity of species, habitats and seascapes. This richness is often recognised at international, national or local level through the designation of protected areas, which may take the form of Natura 2000 sites, Ramsar sites, UNESCO World Heritage sites, recognition of remarkable landscapes or seascapes, marine conservation zones, etc. For example, the Strait of Dover includes Special Areas of Conservation (SAC, under the Habitats Directive), Special Protection Areas (SPA, under the Birds Directive), Ramsar sites, six recommended marine conservation zones (on the English side), marine protected areas, and nationally recognised remarkable landscapes (on the French side).

Similarly in Corsica, the Strait of Bonifacio is covered by the Pelagos Agreement for the Creation of a Mediterranean Sanctuary for Marine Mammals.¹⁰ It also includes two protected areas under the Birds and Habitats Directive: the Natural reserve of the Strait of Bonifacio and the National Park of La Maddalena Archipelago. The Natura 2000 marine sites include *Plateau de Pertusato/Bonifacio et Iles Lavezzi* (FR9400591)¹¹ and *Iles Lavezzi, Bouches de Bonifacio* (FR9410021).¹²

Rare and endangered species

European straits are areas where rare and endangered species are present. For instance, the National Reserve of Bouche de Bonifacio is hosts *Armeria pungens* (vulnerable species in France, endemic ibero-sardanian specie), *Ipomea sagittata* (endangered species in Corsica)

⁸ BIO (2011b), Support to the development of a guidance document on electricity, gas and oil transmission infrastructures and Natura 2000.

⁹ BIO (2011b), Support to the development of a guidance document on electricity, gas and oil transmission infrastructures and Natura 2000

¹⁰ Signed in Rome on 25 November 1999 by France, Italy and the Principality of Monaco.

¹¹ See <http://natura2000.clicgarden.net/sites/FR9400591.html>

¹² See <http://natura2000.clicgarden.net/sites/FR9410021.html>

and *Silene velutina* (species with community interest)¹³. Furthermore, it is home to 196 rare fauna species (specified in the national red list) and four vulnerable mammalian species. In total, 23 of 26 protected or threatened maritime species are present in the strait.

Migratory routes

In general, migratory routes for birds, marine mammals and fishes are located in the area of the European Straits. For instance, the national park of the Cesine in the Strait of Otranto is situated along one of the main migration routes and is home to many rare and endangered birds. The Dover Strait is a migratory route for birds, fishes and marine mammals and provides spawning sites and nesting loons for marine wildlife. It is also a migration route of international importance, with over 250 bird species recorded per year, including rare species such as the Eurasian eagle owl and black stork. Species of migratory maritime mammals, such as the sperm whale and the common bottlenose dolphin, are also present in the Bonifacio Strait. Another example is the Gulf of Finland that lies along the main migration route of arctic birds.

2.3 Pressures exerted on biodiversity and natural environment and related impacts

Pressures resulting from human activities and related impacts

Pollution

Pollution is an important challenge commonly faced by straits. Pollution may result from maritime traffic, i.e. contamination caused by ships due to the intense flow of traffic (and possibly illegal oil discharges), and also as a result of possible accidents where transported hazardous products (e.g. oil, toxic products, etc.) may be released into the environment. This problem is particularly acute in the case of the Strait of Dover, which is one of the most frequented maritime passageways in Europe and in the world. High amounts of hazardous materials are thus transported across the strait, and the intense up-, down- and cross-Channel traffic puts pressure on, and impacts its marine ecosystems. Nonetheless, the risk of boat collision is faced by all straits.

Pollution may also result from land-based activities, such as waste (e.g. industrial waste and waste from landfills that flies into the water), sewage disposal, release of toxic chemicals, diffuse pollution from agricultural activities that induce marine eutrophication, etc. Other types of pollution include marine litter or noise pollution (due to high traffic loads of large boats) that may affect marine species. For instance, due to human activities within the Gulf of Finland a significant amount of chemicals were released in the marine water. The presence of chemical contaminants, such as PCBs, DDTs, dioxins, organotins and highly toxic trace metals have resulted into chronic exposure conditions for marine organisms.

Eutrophication

The phenomenon of eutrophication (or overfertilisation) is of high concern in many European straits. Eutrophication is caused by an excess of nutrients (phosphorus and nitrogen) in water as a result of their use as fertilisers in agriculture or from wastewater originating from sewage treatment plants. It may lead to algae bloom, acidification, oxygen depletion and loss of life in

¹³ Observatoire du Patrimoine naturel des Réserves Naturelles de France (2007) Milieux marins et côtiers. Available at : http://www.reserves-naturelles.org/sites/default/files/librairie/milieux_marins.pdf

bottom water, resulting in negative impacts on ecosystems' biodiversity. For example, eutrophication is the main environmental challenge faced by the Strait of Kvarken, and also a serious concern in the Strait of the Gulf of Finland. In the latter case eutrophication is caused by farming, municipal and industrial wastewater, transportation and other industrial pollutants. It results in oxygen depletion on the sea floor, such that many areas have no or little fauna left.

Invasive species

The introduction of invasive species is an issue that is shared by several European Straits. The introduction of invasive species can be natural, but it is mostly related to human pressures. In the Bonifacio Strait for instance, uncontrolled anchorages in periods of high frequentation destroy the seabed and contribute to the diffusion of invasive species. In the case of the Gulf of Finland, invasive species are a major threat to local ecosystems and biodiversity in general. They have been introduced either by accident or intentionally. This is the case of some alien species from Lake Baikal, Siberia that were introduced intentionally into nearby Gulf of Finland lakes, including the fish species, such as Amur sleeper, *Percottis glenii*, and the amphipod *Gmelinoides fasciatus*. This invading amphipod has displaced the native amphipod *Gammarus lacustris*, both in Neva Estuary and widely throughout the Gulf of Finland.

Natural pressure

Climate change

Climate change is, and will continue to be in coming years, one of the major threats for coastal zones, and also for straits. Sea-level rise is already impacting economic, social and environmental features in coastal zones, as the coasts are often concentrating high densities of human activities, such as aquaculture or port expansions for fisheries, maritime transport, or leisure. In straits, coastal development notably includes important harbors (e.g. Calais and Dover in the Strait of Dover, or the Strait of Messina which includes six ports). These infrastructures alter marine currents and contribute to coastal habitat destruction. Additionally, climate-induced changes in sea surface temperatures are a growing source of vulnerability for marine ecosystems; disrupting fish communities as some species may go beyond their physiological tolerance or shift their ranges.

2.4 Comparative table between straits

The following table compares key features and information of the straits.

Table 3: Comparing key features of the Straits

	Dover Strait	Bonifacio strait	Messina Strait	Sicily Strait	Strait of Otranto	Gulf of Finland	Fehrman Belt	Kvarken
General characteristics								
Wide (in Km)	32	11	3.2	145	72	80	18	80
Maximal depth of the strait (m)	38	100	960	316	n/a	95	20-30	24
Remarkable infrastructure	Ports	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Transport (others)	Channel Tunnel	No	- Railways - Highways	Airport	No	No	No
	Others	No	Gas pipeline under construction	No	No	Gas pipeline under construction	Finland: Gas pipeline	- Wind mills -Subterranean infrastructure under construction
Socio-economic characteristics								

	Dover Strait	Bonifacio strait	Messina Strait	Sicily Strait	Strait of Otranto	Gulf of Finland	Fehrman Belt	Kvarken
Ageing population	Yes, Both side	Yes, French side	No	No	Yes (at least Italian side)	No	Yes, (at least German side)	No
Unemployment above the national average	England: No France: Yes	Sardinia: Yes Corsica: No	Yes	Yes	Yes (at least Italian side)	Finland: No Estonia: n/a	Germany: no Denmark: yes	Sweden: = Finland: n/a
Main economic sectors	-Fishing -Transport -Tourism	- Tourism - Transport - Traditional fishing	- Agriculture - Manufacturing - Construction	- Marble extraction - Tourism - Traditional fishing - Agriculture	- Services (including tourism) - Industry - Agriculture	Finland: Maritime transport Tourism -agriculture - Energy production	- Services	Sweden: - Services - Manufacturin
Traditional fishing activity	-	Yes	Yes	Yes	Yes	No	No	Yes
Important industrial activities	No	No	Yes	No	No (micro enterprises)	No, at least Finish side	Windmill for energy production	No
Biodiversity and Landscape								
Application to the UNESCO world heritage inscription	Yes, at the level of the strait	Yes	Yes	No	Yes, Italian side	No	Yes: City of Lübeck	Yes
Remarkable elements of the landscape	Yes, Both side	Yes	Yes	Yes	Yes, at least Italian side	Yes, at least Finish side	Yes	Yes
Biodiversity								
Protected biodiversity	Yes, both sides	Yes	Yes	Yes	Yes, at least Italian side	Yes, at least Finish side	Yes. National and European areas	Yes, at least Swedish side
For birds	Yes	Yes	Yes	Yes	Yes, at least Italian side	Yes	yes	Yes

		Dover Strait	Bonifacio strait	Messina Strait	Sicily Strait	Strait of Otranto	Gulf of Finland	Fehrman Belt	Kvarken
	Maritime mammals	Yes	Yes	Yes	No	No	No	Yes	Yes
Pressures on the environment									
Human Pressures	Terrestrial tourism	Yes	Yes	No	No	Yes	No	Yes	No
	Maritime tourism	No	Yes	No	No	-	No	No	No
	Waste/pollution on the coastline/sea	Yes	Yes	No	No	Yes (on the Italian side)	Yes (chemical contaminants)	Yes	Yes
	Others	- Maritime traffic - Coastal development	- Maritime traffic -Artificialisation of soils	Artificialisation of soils - Maritime traffic - Overfishing	-	-Artificialisation of soils	- Maritime traffic (risk of collision)	- Maritime traffic - Fixed link	- Maritime traffic - Overfishing
Natural Pressures	Invasive species	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Coastal erosion	Yes	Yes	No	No	Yes	No		No
	Others	- Climate (increase collision risk)	-	-	-	-	- Climate (increase collision risk)	- Climate (increase collision risk)	- Climate (the many effects of climate change) - Stress on species

2.5 Responses addressing key challenges for the natural environment: EU policies and governance practices

The specificities of straits, the overall vulnerability of their ecosystems and the intensity of the drivers, call for an integrated management of these issues. As noted by ESI, “the strong border effect linked to the maritime character of the separation between the two banks can only be eased by a cross-border management method. The straits therefore constitute laboratories for integration and European governing.”¹⁴ In order to achieve such integration, it is necessary to review EU policies applicable to straits, but also existing good cooperation and governance practices.

Under international law, straits are mainly addressed from the perspective of international navigation; this is notably the case with the United Nations Convention on the Law of the Sea (UNCLOS),¹⁵ whose part III deals with ‘Straits used for international navigation’. As to EU law, there is currently no legislation specifically addressing straits and their specificities. However, a number of EU policies are applicable to straits and to specific project developments to be implemented in these straits, and require biodiversity issues to be taken into account.

Water Framework Directive (WFD)

The Water Framework Directive (WFD)¹⁶ is the most substantial and comprehensive piece of EU water legislation and requires all surface, groundwater and coastal waters¹⁷ to reach ‘good status’ by 2015. The WFD is therefore applicable to straits as regards to coastal waters. Article 4.1 introduces the principle of preventing any further deterioration of status. It is expected that the 2015 objective of ‘good ecological status’ for water may substantially support and raise the state of sites under Natura 2000, many of which are dependent on the services delivered by their aquatic component. It is also expected that the WFD objective must have a strong influence on the improvement of nature and biodiversity status outside designated areas.

Marine Strategy Framework Directive (MSFD)

The Marine Strategy Framework Directive (MSFD)¹⁸ promotes the integration of environmental consideration into all relevant policy areas. The MSFD’s overall objective is for Member States to take the necessary measures to achieve or maintain ‘good environmental status’ in the marine environment by the year 2020. Marine strategies must be developed for each marine region or sub-region identified in the directive (and programme of measures established), in order to achieve the following goals: (i) protect and preserve the marine environment, prevent its deterioration or, where practicable, restore marine ecosystems in areas where they have been

¹⁴ http://ec.europa.eu/maritimeaffairs/mk2020_consultation/uploaded_files/74.pdf

¹⁵ United Nations Convention on the Law of the Sea, signed in Montego Bay, Jamaica, on 10 December 1982, entered into force on 16 November 1994.

¹⁶ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy.

¹⁷ WFD Article 2(7) defines ‘coastal water’ as “*surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters.*”

¹⁸ Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive).

adversely affected, and (ii) reduce pressures (inputs from human activities) and their impacts on the marine environment (including marine biodiversity). This is to be achieved through an ecosystem-based approach to the management of human activities, while enabling the sustainable use of marine goods and services.

The MSFD addresses all aspects of biodiversity within the marine waters of EU Member States (excluding WFD transitional waters) within the overall definition of 'good environmental status', which is determined on the basis of 11 qualitative descriptors listed in Annex I (e.g. descriptor 1 sets goals of maintaining biodiversity).

“Nature” Directives

Nature protection in the EU is driven by the two “Nature” Directives, the Birds Directive 2009/147/EC and the Habitats Directive 92/43/EEC. These Nature Directives are based on two pillars: site protection and species strict protection. The site protection consists in the creation of a network of “Natura 2000” sites. This network aims to guarantee the favorable conservation status of some habitats and species, in order to ensure the preservation of European biodiversity. Natura 2000 sites include Special Protection Areas for birds (SPA) under the Birds Directive and Special Areas of Conservation (SAC) under the Habitats Directive to provide endangered animals, plants and habitats with increased protection.

The European Commission has established guidance documents that help in the implementation of the conservation measures provided by the Nature Directives for managing Natura 2000 sites (in particular Article 6 of the Habitats Directive). Some of these guidance documents apply specifically to the marine environment, such as the Guidelines for the establishment of the Natura 2000 network in the marine environment,¹⁹ but also a guidance document on “the implementation of the Birds and Habitats Directives in estuaries and coastal zones, with particular attention to port development and dredging.”²⁰

Environmental Impact Assessment (EIA) Directive

The Environmental Impact Assessment Directive (EIA Directive)²¹ is also an important legal instrument that prevents disturbance of biodiversity. It has introduced a legal requirement to carry out an EIA of development projects when they are likely to entail significant impacts on the environment. Its main purpose is to ensure that national authorities make a systematic examination of the proposed activity, alternatives to this activity, and take the relevant environmental implications of projects into account before approving them. As such, the EIA supports decision-makers, by contributing to rational and structured decision-making, clarifying some of the tradeoffs of the proposed activity.

¹⁹ Available at: http://ec.europa.eu/environment/nature/natura2000/marine/docs/marine_guidelines.pdf

²⁰ Available at: <http://ec.europa.eu/environment/nature/natura2000/management/docs/Estuaries-EN.pdf>

²¹ Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2009 on the assessment of the effects of certain public and private projects on the environment, codifying Directive 85/337/EEC of 27 June 1985 and its three amendments. The types of projects for which an assessment is required are listed in Annex I. Projects requiring assessments only in certain circumstances are listed in Annex II.

Strategic Environmental Assessment (SEA) Directive

The Strategic Environmental Assessment Directive (SEA Directive)²² is considered an extension of the EIA Directive, from the individual project approach to the level of public programmes and plans, focusing on political decision-making, but not including policies. In particular, the SEA Directive explicitly requires environmental assessment in the case of plans or programmes affecting Natura 2000 sites. SEA is part of an earlier and more strategic level of decision-making than EIA. SEA can ensure a better assessment of alternatives and their cumulative impacts by encompassing all projects and activities of a specific type and in a specific region.

Environmental Liability Directive (ELD)

The Environmental Liability Directive (ELD)²³ provides the legal framework for introducing environmental liability and the “polluter-pays principle” in EU business activities and covers species and natural habitats protected under the Birds and Habitats Directives. The damage to biodiversity is only relevant if it “has significant adverse effects on reaching or maintaining the favourable conservation status of such habitats or species.” Where an operator is liable (or expected to be), he is responsible for preventing environmental damage or to prescribe remediation measures in case the damage has already occurred.

The following section presents an overview of the situation at strait level and describes the main responses that have been implemented to address challenges and priority issues related to biodiversity and natural environment.

2.6 Recommendations for future actions at the level of the Network

2.6.1 At the level of the Network

The baseline study has resulted in several key recommendations at the Network level.

GOVERNANCE

- Build one formal entity representing the Network with responsibilities of representation at European and international levels, being able to gather and communicate voices of each strait and all straits
- Structure the functioning of such entity as concerns the rotation of the board, the selection of priority topics for each period, the election of Presidency supported by one strait each year (or period) to represent their own strait
- Build an European Strait Committee with elected regional deputies to talk about issues, hold regular meeting, draft initiatives, and claim for funds to support common activities (improving management or projects)
- Build strategies (short, medium and long term) and related action plans
- Identify priorities from different straits – raising up priorities to the European Commission in a formal document

²² Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment as amended.

²³ Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage.

- Participate in stakeholder consultations and events at EU level.

CAPACITY BUILDING / KNOWLEDGE SHARING

- Collect socio-economic and environmental scientific information and data at several scales: local, regional and transfrontalier.
- Build common databases or a common database
- Make data available to different partners of the Network, informing on the methodological approaches and tools used to collect such data
- Implement tools, formal processes and structured initiatives to continue sharing experience and knowledge between European straits
- Build relationships and share experience and knowledge with non-European straits to build initiatives and identify common issues
- Establish a network of experts specialised on strait-related issues and cross-border issues that will support the Network in developing expertise on common issues
- Develop new research projects (because of data limitations) on biodiversity systems and impacts of pressures on biodiversity

Fields of action to develop jointly:

- Maritime security in a context of increasing traffic
- Opportunity to develop new services and activities in order to capture additional value from maritime transportation
- Opportunity to create
- Impacts and benefits of in-land activities and development for the coastal and marine areas

2.6.2 At Strait level

The baseline study has resulted in several key recommendations that are generic at strait level.

GOVERNANCE

- Raise issues and challenges to the other local and regional institutions that are in charge of specific topics (e.g. maritime security) to build up common and shared strategies and actions
- Ensure the involvement of NGOs and business (specifically for key sectors, such as ferry boats companies) in the governance; specifying their scope of responsibilities and roles; and in more specified businesses (e.g. ferry companies)
- Implement structured tools and processes for a good communication between Straits

KNOWLEDGE

- Develop new research projects (due to data limitations) on biodiversity systems and impacts of pressures on biodiversity
- Develop knowledge and analysis of impacts and opportunities of socio-economic and environmental flows between the two sides of a strait
- Increase and/or develop good relationships between policy makers and universities and researchers on multiple topics (economics, biodiversity and natural environment, etc.)

CAPACITY BUILDING

- Develop training within public institutions for policy makers to increase capacity and expertise on fields that are connected to the integration of biodiversity on territory development and planning

ACTION

- Establish structured processes and tools to share experience and best practices between cross-border partners
- Establish structured processes and tools to share experience and best practices between partners of other straits that have implemented relevant actions in line with the challenges of a strait
- Develop a “mirror” approach, taking the relevant initiatives developed in one side to develop them in the other side, implement the tools that will support such approach
- Analyse the opportunity and feasibility of creating joint services or commercial offers at cross-border level. Joint services (for instance in the tourism sector) are possible now thanks to new infrastructures and communication networks. This could bring new opportunities for job creation.

- Develop a bottom-up approach in order to identify actions and initiatives that are successfully implemented by local authorities, private sector and citizens, and support their dissemination.
- Promote jobs and training and identifying job opportunities in relation to the integrated management of biodiversity and natural environment, with cross-border partnerships, for instance in the following sectors: marine transport, tourism, local planning, fisheries, agriculture.
- Identify opportunities for increased revenues for inland areas coming from Ecotourism, wind farms for agriculture

3 Overview of the baseline study at strait level

This chapter presents the main conclusions of the analysis carried out at strait level.

3.1 Bonifacio Strait

3.1.1 Analysis of the situation at the strait level

Socio-economic background of the Strait

The socio economic situation is quite similar for both sides of the strait. In the two regions, unemployment rates are high and GDP is low. The figures are noticeably higher than those observed on the continent. Despite the fact that both regions seem to suffer from their insularity, their economies significantly depend on the sea. Tourism is the most significant sector. Recreational marine activities such as diving are numerous, and more generally, the richness of nature and the presence of the sea form a good part of their attraction. Neither of the regions benefit from the intense maritime circulation that passes through the strait.

Significance of biodiversity and natural environment in the Strait

Each side of the strait presents great diversity of landscapes, due to the presence of the sea, wild and preserved vegetation, and traditional human construction. These many landscapes have led to complex characterisations. Biodiversity is also rich, composed of many species and habitats. Some of them are classified as endangered. Standing witness to the value of the local biodiversity, the European network Natura 2000 covers a significant part of the strait. Among the protected species are migratory ones: mammals, such as the bottlenose dolphin; and birds, such as the little egret.

The landscapes and natural environment are important to local economic activity (tourism, fishing, people transportation), to the local culture. They benefit from a number of protection and conservation programs.

Human and natural pressures exerted on biodiversity and natural environment

Intensive maritime traffic in the strait represents the biggest threat to the natural environment. Some of the boats crossing the strait transport hazardous materials that could have catastrophic effects if they were ever to be released in the sea. In order to reduce this risk, and to set an example, France and Italy have signed an agreement forbidding any boat transporting hazardous materials, matriculated under their jurisdiction, to pass through the strait. Tourism and leisure related activities constitute other human pressures on the environment. Among the sources of these pressures are pleasure boating and urbanization. Other activities that ceased, such as military basements or industries still present negative effects (E.g. soil pollutions or erosion). The local environment also faces natural pressures. Littoral erosion, marine submersions and invasive species (for instance marine algae) are among the main ones.

Policies, actions and initiatives contributing to an integrated management of biodiversity

Several policies, actions and initiatives are specifically tackling the issue of integrating biodiversity in projects to develop the region and its economic activities. Measures are mainly focused to address the fields of environmental protection and sustainable development of the area.

Integrating biodiversity and natural environment in planning decisions

The scope of cooperative initiatives is mainly to protect the natural environment and local biodiversity. The Pelagos sanctuary agreement, the PIM initiative and the parks trans-border network are all aimed at the capitalisation of knowledge on the local environment, and the implementation of good practices. In addition, the agreement Maritime 2013 2017 calls for integration of natural resources management into local development.

Integrating biodiversity and natural environment in the tourism sector

No specific agreement has been identified that deals directly with the integration of marine resources in the development of the tourism sector. Nevertheless, because of the importance of nature for this economic sector, all the initiatives that contribute to the creation of a sustainable management of the natural resources represent long-term positive actions to this aspect. Several initiatives have been taken in Corsica to increase awareness and to decrease the impact of yachting and maritime tourism on biodiversity. One field of action that Corsica and Sardinia would like to support is the development of in-land tourism.

Sustainable infrastructure and transport

In order to limit the risk of pollution to the sea and coast by hazardous materials, France and Italy have adopted an agreement in 1993 to forbid boats carrying their flags loaded with hazardous or noxious substances to traverse the strait. Nonetheless, many non-Italian or French registered boats containing polluting and hazardous materials still do. This agreement does not concern them. An agreement including the latter would be a significant improvement in the protection of marine and coastal areas.

Promoting cross-border cooperation and governance on biodiversity and natural environment-related issues

Many actors contribute to improve the integration of biodiversity in the development project of the territory. Responsibilities are split between the actors. Based on the European trans-border cooperation tool European Grouping for Territorial Cooperation (EGTC), a structure has been created to represent, at the international level, the interests of the area, and to improve cooperation between stakeholders. The structure is entitled "The EGTC – PMIBB Parc Marin International des Bouches de Bonifacio."

3.1.2 How responses have addressed key pressures on biodiversity and natural environment

The responses that have been implemented in the Strait are mapped on the following tables.

Table 4: Responses to address risks and pressures exerted on biodiversity and natural environment – Bonifacio Strait (1/2)

Activities taking place in the Strait	Adding value to the local livelihood			Exerting pressures and impacting biodiversity and natural environment	Existing responses to address risks and pressures exerted on biodiversity and natural environment		
	Creating jobs	Creating revenues	Supporting Identity & culture		Italian side (Sardinia)	French side (Corsica)	Cross-border
Maritime Transportation (crossing)	✓	✓		Risk of boat collision and related risk of release of hazardous substances transported by boats	<ul style="list-style-type: none"> Legislation compliant with the International Regulations for Preventing Collision at Sea 	<ul style="list-style-type: none"> Legislation compliant with the International Regulations for Preventing Collision at Sea 	<ul style="list-style-type: none"> Prohibition for boats transporting hazardous material to cross the strait Odyssea France-Italy Maritime Projet Ampamed
				<i>Pollution</i>			
	✓	✓		<i>Invasive species</i>			<ul style="list-style-type: none"> Caulerpes Network
Traditional Fishing	✓	✓	✓	Fish stock depletion (limited)	<ul style="list-style-type: none"> Coastal Action Group 	<ul style="list-style-type: none"> Sustainable marine activities 	<ul style="list-style-type: none"> Odyssea France-Italy Maritime initiative for Mediterranean Small Islands Projet Ampamed
Agriculture	✓	✓	✓	Biodiversity decline			
Terrestrial/ Coastal tourism	✓	✓	✓	Urban development, artificialisation of land, disturbance of natural balance, destruction of ground vegetation	<ul style="list-style-type: none"> Supporting the development of in-land tourism 		<ul style="list-style-type: none"> Odyssea France-Italy Maritime The parks' trans-border network (RETRAPARC)
Maritime tourism	✓	✓	✓	Pollution Disturbance of natural balance		<ul style="list-style-type: none"> Life LINDA Water sports Charter in Corsica "Clean and welcoming ports" initiative 	<ul style="list-style-type: none"> Odyssea France-Italy Maritime The Pelagos Sanctuary agreement initiative for Mediterranean Small Islands The parks' trans-border network (RETRAPARC) Projet Ampamed Development of a coordinated tool for recreational diving in Bonifacio strait
				<i>Invasive species</i>		<ul style="list-style-type: none"> Corsican Environment Observatory 	<ul style="list-style-type: none"> Caulerpes Network

Table 5: Responses to address risks and pressures exerted on biodiversity and natural environment – Bonifacio Strait (2/2)

Activities taking place in the Strait	Pressures and impacting biodiversity and natural environment	Existing responses to address risks and pressures exerted on biodiversity and natural environment		
		Italian side (Sardinia)	French side (Corsica)	Cross-border
Urban planning / territorial planning	Artificialisation of land, Coastal development, coastal erosion, impact on coastal and terrestrial ecosystems	<ul style="list-style-type: none"> • Sassari 2020 20 (climate) 	<ul style="list-style-type: none"> • Regional scheme of the Green and Blue Belt Network 	
Seascape - Marine planning	Transversal pressures on marine and coastal ecosystem		<ul style="list-style-type: none"> • Regional scheme of the Green and Blue Belt Network • Life LINDA 	<ul style="list-style-type: none"> • Odyssea France-Italy Maritime • The Pelagos Sanctuary agreement initiative for Mediterranean Small Islands • Projet Ampamed
Improving governance between actors and joint strategies	n/a		<ul style="list-style-type: none"> • Corsican Environment Observatory 	<ul style="list-style-type: none"> • EGTC • Odyssea France-Italy Maritime • European Grouping of Territorial Cooperation (PMIBB) • The Pelagos Sanctuary agreement initiative for Mediterranean Small Islands • The parks' trans-border network (RETRAPARC)

3.1.3 Key priorities for future actions

The PMIBB has identified some priority actions:

- Develop, update and share a common and cross-border understanding of:
 - Biodiversity and the natural environment (e.g. complete on-going inventories);
 - The impacts of human and natural pressures on biodiversity and natural environment;
- Submitting research projects to better understand natural systems and their functions (how species live together?) in the framework of the INTERREG Program, using the EGTC as a legal platform (studies in such areas can be costly). Some topics could be: adult fish, locating spawning grounds or sites for larvae and juveniles to grow.

3.1.4 Recommendations for future actions

GOVERNANCE

- Develop a network of actors gathering public institutions, private sectors, researchers in each key sector.

KNOWLEDGE

- Address pressures exerted on biodiversity and natural environment and related impacts that have yet to be addressed in initiatives and actions.
- Evaluate the natural impact of hazardous substance dispersal in the strait. It could stimulate actions at international level (e.g. European agreement).
- Develop knowledge and analyse economic and social flows between the two sides of the strait. Develop tools to monitor such flows.

ACTION

- Promote jobs and training, identify employment opportunities in relation to the integrated management of biodiversity and natural environment, with cross-border partnerships, for instance in the following sectors: marine transport, tourism, local planning, fisheries, and agriculture.
- Highlight and value the cultural identity of the Strait territory, and develop new business opportunities in relation to this identity, for instance on the tourism sector.
- Develop common strategies and actions to support the development of sustainable transport, in particular transport of goods by road from the ferry ports.
- Develop common actions to consistently manage the yachting activity in the Bonifacio Strait.

- Establish a common piloting service (using the EGTC as the responsible entity).
- Support the recognition of the Bonifacio Strait as a “PSSA (Particularly Sensitive Sea Area)” at the international level (using the EGTC as legal entity) in order to be able to implement related measures to increase the security in the strait.
- Work on the implementation of good practices in relation to waste water management and storage tanks of boats.
- Apply to have the Marine Park of the Bouches de Bonifacio on the list of UNESCO World Heritage sites.
- Ensure coherence between actions and harmonise existing actions on both sides related to touristic flows.
- Develop inland tourism focused on hiking trails, gastronomy and culture.
- Address the challenges of professional fishery and develop sustainable artisanal fishery practices, for instance working on certification tools and training for fishermen.

3.1.5 Towards the implementation of good practices developed by other NOSTRA partners

During the workshop that took place in Reggio Calabria in February 2014, the partners of the Bonifacio Strait were asked to identify the best practices developed by other partners of the Network they would like to implement in order to achieve their ideal Strait. The relevancy of transferring such best practices in the Bonifacio Strait is analysed below, taking into account the outcomes of the baseline study.

Towards “Kvarken Council Joint governance”

The Kvarken Council is a cross-border cooperation association formed by the cities of Vaasa, Kokkola, Seinäjoki and Jakobstad and the three Regional Councils of Ostrobothnia in Finland, and the Regional Council of Västerbotten and the city of Örnsköldsvik in Sweden. The Kvarken Council functions as a non-profit bi-national organisation. The Board has 6 members from Finland and 6 members from Sweden. The Kvarken Council was founded in 1972 and has had approximately 100 different cooperation projects in infrastructure, communications, tourism, university cooperation, food, business, education, culture, etc. The Council has staff in both Finland and Sweden. The board consists of 6 board members from Finland and 6 board members from Sweden. The Chairmanship is circulating between the cities of Vaasa and Umeå, two years each.

In the case of the Bonifacio Strait, the implementation of the EGTC-PIMBB will already ensure a cross-border dialogue platform. It will be the tool to support cooperation projects in environment and biodiversity, and eventually other fields as the Kvarken Council does. The partners of the EGTC-PMIBB could take ideas from the Kvarken Council regarding internal functioning, governance, operations, and responsibilities. A representative of each side could be physically present in the other side to ensure a good communication and coordination. It could be relevant to make the Chairmanship circulate between the two sides, two years each.

Towards “Tourist economic development Salento area”

The baseline study has identified tourism development as a priority sector for action in order to support both economic development and biodiversity preservation. It would be relevant to implement a project supported at one-side level or as a cross-border project that will aim at increasing the potential of inland tourism, valuing both the cultural and natural values. This will allow re-positioning the traditional beach tourism segment and diversifying the tourism offers available in the region. The tourism that would have to be integrated in the overall strategy of the Strait area is a sustainable tourism, which contributes to both an integrated management of biodiversity and natural environment and a creation of jobs and revenues in inland areas.

Towards “UNESCO World heritage by storytelling”

Becoming a site on the UNESCO World heritage list may contribute to create new business opportunities and to open new possibilities of development. It is relevant to involve the local people on both sides of the maritime border in this cross-border project, in order to increase their awareness on the emerging opportunities and to develop a common culture. Being a UNESCO World heritage site at the level of the Strait represents an opportunity to develop common tourism and culture products and services. Activating the storytelling of the local people could support the emergence of ideas. Taking into account the outcomes of the baseline study which elaborated recommendations in line with the creation of cross-border opportunities, the emergence of a common identity, the challenges of job creation and new business opportunities, this initiative would be relevant to implement at the level of the Strait.

Towards “A Strategy for sustainable mobility”

Implementing a strategy for sustainable mobility appears to be a priority for the Bonifacio Strait since flows of goods and passengers are significant across the Strait as well as in the inland areas near the main ports which connect Corsica and Sardinia. They are significant in terms of density and intensity and impacts on the environmental and socio-economic situation of the Strait. The external accessibility is a major asset to support the socio-economic development of the strait and limit the negative effects of intense traffic on the environment. It would be relevant to develop intermodal and efficient transport systems in the areas that are located close to the main ports to limit congestion and the related impacts of intense traffic. Moreover, elaborating and proposing alternative uses of car for individuals would be relevant to decrease congestion. Finally, progress could be made in introducing an ecological management and rational exploitation of the road.

Towards “MIRG-EU Maritime Incidence Response Group - Cross-border firefighters teams”

The MIRG-EU (Maritime Incidence Response Group) gathers Dutch, Belgian, French and English fire brigades. They are working to establish a specialised international group of fire fighters with expertise and knowledge to effectively respond to maritime incidents, involving board passengers' ships and vessels.

The occurrence of maritime incidents in the Bonifacio Strait could have dramatic impacts for humans and for biodiversity and natural environment. Furthermore, the probability of occurrence of maritime incidents in this area justifies to have specialized staff prepared to intervene in case of incidents. The expertise to intervene on maritime incidents has not been developed among

the fire fighters who work in the Bonifacio Strait. The first step towards such initiative could be to carry out a risk analysis for the region, to know better what kind of vessels and incidents can be expected in the area, and which ones, what kind of responses could be elaborated. Furthermore, it would be relevant to identify local staff that could be trained to intervene directly or by supporting the international forces in case of maritime incidents.

Towards “ODISSEA Project Reggio Calabria

The EU project ODISSEA was developed and implemented in Reggio Calabria to ensure the EMAS certification of a number of towns and villages which did not continue to adhere to this direction once the authorisation was obtained. The project was aimed to promote environmental restoration and sustainable development perspective along the axis of the Tyrrhenian coast and Aspromonte, including the municipalities of Reggio Calabria, Santo Stefano in Aspromonte, Scilla and San Roberto.

This initiative could be relevant for the Bonifacio Strait in order to increase the involvement of towns and villages that are located on the two sides of the Strait in the preservation of biodiversity and natural environment. To date, the involvement of local authorities is limited. They do not demonstrate a high willingness to integrate biodiversity and natural environment in local planning and development. Indeed they have limited responsibilities in managing environment and biodiversity compared to other responsible and dedicated structures (such as the partners of the Nostra project). Such project could support and increase their contribution.

Towards “Baltic FLYWAY Project Securing Birds Migration”

Baltic Flyway is an Interreg IV A project from the Fehmarn Belt programme 2010 – 2013, in which seven nature-oriented organisations cooperate to create better environmental conditions for migratory birds²⁴. It is a good example of cross border cooperation.

Baltic Flyway focused on three areas:

- Cross-border cooperation between the stations and bird sanctuaries;
- Conservation initiatives to promote biological peculiarities here under special conditions of the migratory birds;
- Promotion of adventure opportunities with a focus on migratory birds.

Locations of bird refuges areas were implemented in Fehmarn Belt area covered by the Baltic Flyway, together with some observation stations for observing birds.

It would be relevant to implement such initiative in the Bonifacio Strait. First, the Bonifacio strait is a migratory route for bird species. As highlighted previously, because of their central location in the Mediterranean Sea, Corsica and Sardinia are a privileged stopover for migratory birds flying from sub-Saharan Africa. For some of them, the strait is also a place for reproduction. Despite a high number of natural protected areas (including areas protected under the Birds Directive), migratory birds could be exposed to pressures when stopping in the Bonifacio Strait. Nonetheless, to date, no initiative dealing specifically with bird species have been implemented in the Strait (at one side-level or as a cross-border action).

²⁴ NOSTRA (2013), *Baltic Flyway – An example of good practice for cross-strait cooperation from Fehmarn Belt*

Furthermore, the NOSTRA partners of the Bonifacio Strait could take benefit of their high and historic collaboration to implement such initiative. The fact that all partners of the two sides of the Strait have been used to work together will ensure that some difficulties are easily overcome (language issues, different administrative systems). This project could be integrated in the Action plan or cross border development plan of the EGTC-PIMBB. Then, the initiative could benefit from the governance of the EGTC-PMIBB (regular meetings, regular communication, process of decision-making) to be established.

Moreover, implementing such initiative will allow targeting the objective of preserving biodiversity and the one of developing in-land or coastal tourism, in order to decrease the pressure exerted by tourism on marine ecosystems.

Finally, the best conditions for success seem to be gathered at the level of the Strait to ensure the implementation of an initiative to secure birds migration.

3.2 Dover Strait

3.2.1 Analysis of the situation at the strait level

The Dover Strait is a geographical area which mixes cities, large infrastructures (mainly ports and the Channel Tunnel), and remarkable natural areas.

Socio-economic background of the Strait

Local revenues and jobs are mainly created in the sector of agriculture, tourism (mainly nature-based tourism) and fisheries; all economic sectors rely on the maintenance of good quality ecosystem services and biodiversity. Maritime and terrestrial transports are important activities in terms of volumes of goods and passengers transported and flows. Nonetheless, these activities do not highly contribute to local value. Deindustrialisation, mainly in Pas-de-Calais, causes significant social, environmental and urban crisis. The Strait is characterised by a deprivation phenomenon and by an issue of ageing population (mostly in Kent).

Significance of biodiversity and natural environment in the Strait

The Strait counts valuable and significant biodiversity and natural environment. It is a migratory route for birds, fish and marine mammals and provides spawning sites and nesting loons for marine wildlife. The identification of rare and threatened species is completed (The Kent red data book and the Nord-Pas de Calais red list). There is already a dense network of protected areas, which are protected under European, national and/or regional designations. Furthermore, initiatives are taken in both English and French sides to increase the number and extent of protected areas. For instance, in the English side, The Kent Biodiversity Action Plan contributed to produce around 30 Habitat Action Plans and to increase the number of protected hectares. The definition of additional areas as Biodiversity Opportunity Areas contributes to the aim of restoring and conserving biodiversity. In France, an economic tool allows acquiring Sensitive Natural areas (the Land planning tax). The acquired areas are then included in the Town Planning Code and subject to strict regulations (estimated around 4,287 ha). Finally, it is worth highlighting that the landscape and seascape contribute to the cultural identity of the inhabitants of Kent and Pas-de-Calais.

More and more initiatives are taken to develop knowledge and to monitor biodiversity in the area, in particular cross-border research programs (e.g. CHARM, CRESH, and PANACHE).

Human and natural pressures exerted on biodiversity and natural environment

The main pressures exerted on biodiversity and natural environment are coming from maritime transport, industries, fisheries and tourism. Also, the densification/artificialisation of the soil due to the expansion of urban areas and economic activities contribute to pressures. Pressures are expected to increase due to the certain intense development of traffic and trade flows in the Dover Strait in the future. Related impacts are air pollution, fish stock depletion, and the introduction of invasive species. There is also a high risk of boat collision, and of a release of hazardous substances that are transported by the cargos travelling through the Strait. To address this risk, national legislations in England and in France require the compliance with the International Regulations for Preventing Collisions at Sea. Nature pressures are climate change, sea level rise, coastal erosion, and invasive species. Some research projects have been carried out to assess specifically the impacts of human and natural pressures on biodiversity and ecosystems in the Strait (e.g. MEMO, DIESE).

Policies, actions and initiatives contributing to an integrated management of biodiversity

Several policies, actions and initiatives are specifically tackling directly the issue of integrating biodiversity in the development project of the territory and in the development of economic activities in the region. Responses are mainly addressing the fields of: maritime and terrestrial transport, fisheries and tourism, but also address urban planning and agriculture.

Integrating biodiversity and natural environment in planning decisions

In addition, public frameworks have been initiated to contribute to the preservation of biodiversity, such as the Regional Scheme of the Green and Blue Belt Network in France. In the framework of this scheme, the preservation of biodiversity is considered in **planning decisions**. In UK, the National Planning Policy framework aims to preserve biodiversity and natural and local environment. Actions in the field of developing and restoring green infrastructures participate in the integration of biodiversity in planning decisions (e.g. Dover's District Green Infrastructure Strategy, Regional scheme of the Green and Blue Belt Network). The objective of the Seascape Character Assessment is to inform marine spatial planning in the Dover Strait.

Integrating biodiversity and natural environment in the fishery sector and for the management of living marine resources

The Common Fisheries Policy was implemented in 2003 in both English and French sides to promote a sustainable management of fisheries resources while respecting the imperatives of fishing activities. The research project CRESH analysed the fish stocks in the Channel and provide recommendations to fishermen and their partners for a sustainable management of cephalopods. The CHARM project aimed at developing and disseminating knowledge to stakeholders for the sustainable management of living marine resources.

Integrating biodiversity and natural environment in the agriculture sector

The study did not find specific actions in the agricultural sector aimed at integrating biodiversity in Kent. Two main initiatives have been implemented on the French side: Convention for

maintaining agriculture in wetlands in the Artois-Picardie Basin and the Protection and development of agricultural and natural semi-natural areas.

Integrating biodiversity and natural environment in the tourism sector

Several initiatives have been developed on one side or the other to develop sustainable tourism in sensitive or protected areas (e.g. The European Sustainable Tourism Charter is applied in French Regional Natural Park, Initiative to preserve and value rural roads creating walking and hiking routes). On the English side, Kent supports the development of sustainable activities in businesses and the Green Blue initiative tends to integrate environmental challenges in the Yachting sector.

It is relevant to note that many cross-border initiatives have been implemented in the recent years to act for sustainable tourism: the CAST project, focusing on coastal areas, and the Sustainable Tourism Program which aimed at building bridges between the Natural Regional Park of Caps and Marais d'Opale and Kent Downs AONB.

Integrating biodiversity and natural environment in the transport sector

Ports and transport companies are developing initiatives that tend towards sustainable management of the transportation activities. Cross-border research projects have been carried out to promote cooperation between actors (ports authorities) to promote railway connection and in general a more efficient and sustainable transport network (i.e. Connect2Compete project, FLIP project, PATCH project).

Promoting cross-border cooperation and governance on biodiversity and natural environment-related issues

Many actors contribute to improve the integration of biodiversity in the territorial development projects. Responsibilities are split between the actors. We note that there is no unique body, neither on the French side nor on the English side that coordinate actions in this field.

Among the initiatives that tend to strengthen cross-border cooperation, research projects funded by European funds allow **a cross-border cooperation to develop knowledge on marine life** and on the evolution of its state in terms of quality and quantity due to human and natural pressures (i.e. CRESH project, DIESE project, CHARM project, MEMO project). The PANACHE project is currently working on building a stronger and more coherent approach to the management, through monitoring and involving stakeholders for Marine Protected Areas across the Channel.

Some research projects are willing to promote a sustainable and cross-border cooperation and governance between ports (between small and medium-sized ports) located in the Channel area (i.e. PATCH project, Connect2Compete project) and local communities (i.e. FLIP project).

3.2.2 How responses have addressed key pressures on biodiversity and natural environment

The responses that have been implemented in the Strait are mapped on the following tables.

Table 6: Responses to address risks and pressures exerted on biodiversity and natural environment – Dover Strait (1/2)

Activities taking place in the Strait	Adding value to the local livelihood			Exerting pressures and impacting biodiversity and natural environment	Existing responses to address risks and pressures exerted on biodiversity and natural environment		
	Creating jobs	Creating revenues	Supporting identity and culture		English side	French side	Cross-border
Maritime transportation	✓	✓		Risk of boat collision and related risk of release of hazardous substances transported by boats	• Legislation compliant with the International Regulations for Preventing Collision at Sea	• Legislation compliant with the International Regulations for Preventing Collision at Sea	• Traffic Separation Scheme(TSS)/ The Channel Navigation Information Service
				Invasive species			• Research project MEMO
				Air pollution			
				Other pollution and pressures	• Sustainable development of freight by John Shirley International Freight Forwarders Ltd • Integrated management of biodiversity and natural environment promoted by Ports	• Integrated management of biodiversity and natural environment promoted by Ports	
Terrestrial transportation	✓	✓		All pressures / transversal			• Connect2Compete • Eurotunnel
Ports services	✓	✓	✓	All pressures / transversal			• FLIP • PATCH • Connect2Compete
Fisheries	✓	✓	✓	Fish stock depletion	• Common Fisheries Policy	• Common Fisheries Policy	• Research project CRESH
Agriculture	✓	✓	✓	Biodiversity decline Decline of agricultural areas		• Convention for maintaining agriculture in wetlands in the Artois-Picardie Basin • Protection and development of agricultural and natural semi-natural areas	
Terrestrial / Coastal tourism	✓	✓	✓	Urban development, artificialisation of land, disturbance of natural balance, destruction of ground vegetation		• European Charter for Sustainable Tourism • Departmental plan for walking and hiking routes (terrestrial)	• "Sustainable tourism" program • CAST (Coastal Actions for Sustainable Tourism)
Maritime tourism			✓	Disturbance of natural balance Invasive species Pollution	• Green Blue initiative (Yachting sector)		

Table 7: Responses to address risks and pressures exerted on biodiversity and natural environment – Dover Strait (2/2)

	Creating risks and pressures, and impacting biodiversity and natural environment	Existing responses to address risks and pressures exerted on biodiversity and natural environment		
		English side	French side	Cross-border
Urban planning / territorial planning	Artificialisation of land Coastal development, coastal erosion, impact on marine ecosystems	<ul style="list-style-type: none"> National Planning Policy Framework Dover's District Green Infrastructure Strategy 	<ul style="list-style-type: none"> Regional scheme of the Green and Blue Belt Network Land planning tax 	
Marine planning		<ul style="list-style-type: none"> Seascape Character Assessment 		
Improving governance between actors and joint strategies			<ul style="list-style-type: none"> Actors Network of Naturalistic Nord-Pas-de-Calais Information 	<ul style="list-style-type: none"> FLIP (ports and local communities) PATCH (ports) CAST (Coastal Actions for Sustainable Tourism) Other cross-border projects

3.2.3 Recommendations for future actions

GOVERNANCE

- Implement a unique structure that could represent the Dover Strait at European and national levels.
- Clarify governance in charge of taking decisions on biodiversity-related issues and implementing actions, in order to define scope of responsibilities and activities and avoid overlaps
- Develop a network of actors gathering public institutions, private sectors, and researchers in each key sector: E.g. develop a network similar to the Actors Network of Naturalistic Nord-Pas-de-Calais Information (RAIN) in the Kent

KNOWLEDGE

- Develop, update and share a common and cross-border knowledge on:
 - Biodiversity and natural environment (e.g. complete on-going inventories)
 - The impacts of human and natural pressures on biodiversity and natural environment:
- Addressing pressures exerted on biodiversity and natural environment and related impacts that have not been addressed yet in initiatives and actions.

ACTION

- Share experience and best practices between cross-border partners when there is a lack of action in one specific sector in one side of the strait.
- Implement actions and initiatives to tackle the common challenge of air pollution due to traffic
- As a priority, the issue of air pollution due to congestion and intense maritime traffic has to be addressed by a cross-border action.
- In Kent, address the integration of biodiversity challenges in the agricultural sector.
- Create job opportunities through the development of cross-border business opportunities (common products and common offer) in order to address the economic deprivation
- Implement a common strategy to assess and reduce the impact of transport infrastructure in the strait.

3.2.4 Towards the implementation of good practices developed by other NOSTRA partners

During the workshop that took place in Reggio Calabria in February 2014, the partners of the NOSTRA network were asked to identify the best practices developed by other partners of the Network they would like to implement in order to achieve their ideal Strait. The relevancy of transferring such best practices in the Dover Strait is analysed below, taking into account the outcomes of the baseline study.

Towards “FehmarnBelt days”

The Fehmarn Belt days aim to create connections between the two sides of the Strait. During a limited time (3 days in 2014), they provide a platform for stakeholders from the strait to exchange ideas and experiences, to discuss on cross-border collaboration and to identify new opportunities to support the emergence of the Strait area.

Such event seems feasible and relevant to be transferred in the Dover Strait. The already close collaboration between Kent and Pas-de-Calais will be a key factor for success to allow implementing such initiative. Furthermore, such event could help the emergence of new cross-border opportunities and solutions in the field of tourism, economic deprivation and labour market, and transports and logistics.

In the Fehmarn Belt, the Fehmarnbelt Business Council is the coordinator of such event. It represents about 400,000 companies working on cross border activities. In the case of the Dover Strait, such business organisation does not exist. The first step to go towards such event would be to identify the best contact points for government and administration that could coordinate the event and raise awareness among business actors, researchers, experts, public makers to work together on cross border issues and contribute to the emergence of innovative solutions towards a dynamic and more integrated Dover Strait.

Towards “EGTC-PIMBB”

Recently, a joint agreement was adopted between Kent and Pas-de-Calais. It allows implementing common works on several fields, such as tourism, sports, arts and culture. Nonetheless, there is no existing cross-border structure in charge of biodiversity and natural environment-related challenges. Going towards the creation of an EGTC for the Dover Strait is recommended since this instrument would ensure the definition of an unique structure in charge of governing the territory at the level of the territory, with precise responsibilities and duties, rules of functioning and governance, decision-taken process, communication process. It could ensure a better coordination in the work between the two sides, in the case of defining strategy and action plans, and In the case of implementing actions.

Towards “Gulf of Finland year”

Gulf of Finland Year 2014 is a common project of Estonian, Russian and Finnish experts, which created the first opportunity to analyse in detail the ecological status of the Gulf of Finland.

The baseline study has shown that multiple actors are involved in research and knowledge development in order to develop the knowledge of the ecological and environmental status of the Dover Strait in a context of increasing human and natural pressures. However, identifying

the good contact to collect information may be difficult. Furthermore, there is no available global picture of the ecological status at the level of the Dover Strait. In this context, the implementation of an initiative such as the Gulf of Finland year in the Dover Strait would be highly valuable to fill the existing knowledge gap. Creating a network of experts that have worked on research projects (national or cross-border projects) would be a first step.

Towards “UNESCO World heritage by storytelling”

Based on the outcomes of the baseline study, implementing an initiative similar to the UNESCO World heritage by storytelling in the Dover Strait seems relevant. The main reasons are:

- The area has a strong cultural history heritage. There is a high cultural identity in the Dover Strait. In particular, the common cultural heritage Defence and invasion form an important reference in the cultural landscape.
- The General Council of the Pas-de-Calais and Kent County Council are already engaged in a process of preservation and enhancement of natural and cultural heritage of the Dover Strait. The project plans to jointly propose the classification of the strait on the Natural World Heritage List of UNESCO.
- Such initiative will support the work in progress in identifying and valuing the key features of the area.
- Such initiative would support the objective of creating new common business opportunities in the tourism sector at local and cross-border levels.

3.3 Fehmarn Belt

3.3.1 Analysis of the situation at the strait level

Social-economic background of the Strait

Both sides of the Fehmarn Belt strait are rather rural regions. In Germany, about 67% of total land covers are dedicated to agricultural purpose, and some of which have multi-functions including windmill and agro-tourism. In addition, the Fehmarn Belt strait is a vital access point for transport of passengers and goods between Scandinavia and Northern Europe, connecting two large cities located in the hinterland: Hamburg on the German side and Copenhagen on the Danish side. It is also one of the most important shipping routes between the Baltic Sea through the Great Belt and into the Atlantic, where large container carriers and oil tankers with considerable depths need to pass. At the moment, the on-going project of constructing a tunnel to connect both sides instead of the present ferry link between Puttgarden and Rødbyhavn will speed up the transport between Copenhagen and Hamburg. This change will have dramatic impacts on the regional development on both sides of the strait in the long-run.

Significance of biodiversity and natural environment in the Strait

Fehmarn Belt is a strait with depths of up to 35 metres, through which about 70 percent of the water exchange between the North Sea and Baltic Sea, making it of key importance for the movement and interchange of marine species. The presence of reefs provides essential

ecological values to the local marine environment. The Baltic Sea as a whole is a major migratory route especially for waterfowl, geese and waders nesting in the arctic tundra. In particular, the Fehmarn Belt is an important area for many protected and vulnerable land and water birds. Wintering birds such as eiders and other diving ducks can be counted in their thousands in the winter months, and many migrating birds pass the Fehmarn belt. For this region, there are many areas included as Natura 2000 sites and regulated under the EU Bird and Habitat Directives. There also exist some natural reserves on both sides of the strait.

Human and natural pressures exerted on biodiversity and natural environment

Human activities such as domestic sewage, farming, industry, traffic, and energy production also impose pressures on biodiversity and ecosystems in the strait. Major threats to the marine biotopes of the German coast are eutrophication and other forms of pollution (especially oil pollution). These are mainly caused by the intensive maritime traffic in the strait, which is estimated between 35,000 and 40,000 ships per year. Yet this number is expected to increase by 47 % by 2030, or even more according to other studies (between 80,000 and 100,000 ships a year expected by 2030). Maritime transport also generates exhaust gases, sewage and garbage, bilgewater, anti-fouling paint, hazmat, ballast water, criminal degassing and accidental oil spill.

Moreover sand and gravel extraction and dumping of dredged material may also impair marine life in the areas concerned. The impact of fisheries is mainly the killing of sea ducks and marine mammals as unwanted by-catch, especially of set-net fishery. Since bottom trawl fishery is prohibited by law in the coastal waters up to three nautical miles from the base line, the most sensitive benthic communities can be considered as protected from this kind of disturbance.

Policies, actions and initiatives contributing to an integrated management of biodiversity

Germany and Denmark have a long-standing tradition of political cooperation. Especially Northern Germany and Denmark have been close enough in history to leave a tangible mark on Fehmarn Belt. One outcome of this proximity is the remarkable language skills of Danish and German people: national statistics show that 58% Danish people speak German²⁵.

There are many existing structures for cross-border cooperation in the Fehmarn Belt region; Fehmarn Belt benefited from EU Interreg support (Strand A: cross-border cooperation). This helped in developing many different programs like “Destination Fehmarnbelt” or the STRING-corridor.

3.3.2 How responses have addressed key pressures on biodiversity and natural environment

The responses that have been implemented in the Strait are mapped on the following tables.

²⁵ Special Eurobarometer n°243 (2006), [Europeans and their languages – Three most widely known languages](#)

Table 8: Responses to address risks and pressures exerted on biodiversity and natural environment – Fehmarn Belt (1/2)

Activities taking place in the Strait	Adding value to the local livelihood			Exerting pressures and impacting biodiversity and natural environment	Existing responses to address risks and pressures exerted on biodiversity and natural environment		
	Creating jobs	Creating revenues	Supporting Identity and culture		German side	Danish side	Cross-border
Maritime transportation	✓	✓		Boat collision and risk of release of hazardous substances transported by boats	• Legislation compliant with the International Regulations for Preventing Collision at Sea	• Legislation compliant with the International Regulations for Preventing Collision at Sea	• Implementation of a Vessel Tracking Service System
				Invasive species			
				Air pollution/water pollution			PRIVATE: • greener ferryboats: towards zero emission ferries
				<i>All pressures/transversal</i>			• the Danish Action Plan for the Aquatic Environment (APAE) • STRING-corridor • Building animal passages during the fixed link's construction phase
Terrestrial transportation	✓	✓		<i>All pressures/transversal</i>			• STRING-corridor
Energy production (windmills)	✓	✓		<i>All pressures/transversal</i>			
Fisheries	✓	✓	✓	Fish stock depletion			• the Danish Action Plan for the Aquatic Environment (APAE)
Agriculture	✓	✓	✓	Reducing biodiversity			
Terrestrial/ Coastal tourism	✓	✓	✓	Urban development, artificialisation of land, disturbance of natural balance, destruction of ground vegetation			
Maritime tourism	✓	✓		Disturbance of natural balance			• the Danish Action Plan for the Aquatic Environment (APAE) • Destination Fehmarn Belt PRIVATE: • Project Undine

Table 9: Responses to address risks and pressures exerted on biodiversity and natural environment – Fehmarn Belt (1/2)

Activities taking place in the Strait	Exerting risks and pressures, and impacting biodiversity and natural environment	Existing responses to address risks and pressures exerted on biodiversity and natural environment		
		German side	Danish side	Cross-border
Urban planning / territorial planning	Artificialisation of land Coastal development, coastal erosion, impact on marine ecosystems	<ul style="list-style-type: none"> • German Regional Management (REK) 		<ul style="list-style-type: none"> • EU Natura 2000 network • Fehmarn Belt Days • Baltic Green Belt • Baltic Flyway
Marine planning				<ul style="list-style-type: none"> • EU Natura 2000 network • Convention on the Protection of the Marine Environment of the Baltic Sea Area • Fehmarn Belt Days
Improving governance between actors and joint strategies		<ul style="list-style-type: none"> • German Regional Management (REK) 		<ul style="list-style-type: none"> • STRING-corridor • Baltic Flyway • German-Danish Regional Management

3.3.3 Recommendations for future actions

GOVERNANCE

- Incorporate the European Grouping of Territorial Cooperation (EGTC) in the region of Fehmarn Belt. EGTC is a cooperation instrument at Community level, which was introduced in 2007 as part of the reform of regional policy for the period 2007-2013.
- Rationalise the number of various cooperation structures. There exist too many structures for cross-border cooperation in the Fehmarn Belt region, leading to an unwelcomed competition among these structures.

KNOWLEDGE

- There is a need of increasing knowledge-sharing based cooperation between both sides of the strait. In particular, the information related to regional biodiversity is poor, and the research capacity on both sides is very limited, reflecting by the number of biologists/ecologists participating in the work of regional development.
- More efforts would be need to systematically study various stressors impacting the biodiversity and ecosystems in the region. At the moment, only one complete study in this regard exists/has been completed and is the environmental impact assessments used to evaluate the impacts of the two construction plans of the fixed-link.

ACTION

- The concern of long-term sustainability in terms of the sustainable use of biodiversity resources should be integrated into the regional development plans on both sides of the strait, as many local economic activities rely on healthy ecosystems.
- There is a need of strengthening the biodiversity and natural conservation measures in both regions, which may also contribute to the creation of green-jobs and enhance the local livelihoods (through the regulating and cultural services provided by the ecosystem).

3.3.4 Towards the implementation of good practices developed by other NOSTRA partners

During the workshop that took place in Reggio Calabria in February 2014, the NOSTRA partners were asked to identify the best practices developed by other partners of the Network they would like to implement in order to achieve their ideal Strait. However, the partners of the Fehmarn Belt did not submit the best practices they may have chosen.

3.4 Gulf of Finland Strait

3.4.1 Analysis of the situation at the strait level

The Gulf of Finland is a geographical area which mixes cities, large infrastructures (mainly ports), and remarkable natural areas.

Social-economic background of the Strait

The Gulf of Finland is said to be one of the densest operated sea areas in the world. More than seven million trips per year (mainly two-way trips) are made between Tallinn and Helsinki (HTTTransPlan Project, 2012). The growing transport volumes are connected with increasing interaction between the regions in terms of tourism, business activities, migration, cross-border work, studying and all kinds of social interaction. Cross-regional economic interaction between the Tallinn-Harju and Helsinki-Uusimaa regions is increasing, mainly falling in the following sectors: trade of goods and services, cross-border activities of enterprises, transport, tourism and cross-region work (Laakso et al, 2013). Cross-border work increased considerably over the last 10 years, especially via participation of Estonian workers in Helsinki-Uusimaa labour markets. Laakso et al. (2013) estimated that the part of earnings from Helsinki-Uusimaa shifted to Estonia caused a net increase of €200 – 300 million of the value added in Estonia via direct and indirect effects. Cross-border trade and production have also increased rapidly during the last 10 years, mainly influenced by Finnish manufacturing enterprises that have relocated plants to Estonia. In 2010, about 440 Finnish subsidiaries were operating in Estonia, and were providing a turnover of 3,900 million Euros. The number of personnel employed by Finnish firms represents about 5 % of total employment in Estonia.

Significance of biodiversity and natural environment in the Strait

Baltic Sea is a young sea in geological terms, thus there was not enough time for species differentiation. The brackish water also sets limits on species adaptation: it is too salty for freshwater species, and not salty enough for saltwater species. There are only few species specifically adapted to brackish water. Gulf of Finland lies along the main migration route of arctic birds. There are many national nature conservation areas in the Gulf of Finland most of which are part of the European Natura 2000 network. All the conservation areas in the Gulf are part of the Baltic Sea Protected Areas network. In the region, invasive species introduced either by accident, through the ballast of the ships, or intentionally are a major threat to local ecosystems and biodiversity in general.

Human and natural pressures exerted on biodiversity and natural environment

The Baltic Sea is among the most polluted seas in the world. This is partly explained by its shallowness, small volume of water and poor exchange of water. Moreover, human activities such as domestic sewage, farming, industry, traffic, and energy production also impose significant pressures on the already vulnerable marine ecosystem. In the Gulf of Finland, petroleum transports account for over 50 % of the total maritime transport, which imposes pressures on the natural environment in terms of higher risk of oil spills, water pollution, and invasive species. In addition, other human activities causing chemical contaminants, such as PCBs, DDTs, dioxins, organotins and highly toxic trace metals have resulted into chronic exposure conditions for marine organisms.

Policies, actions and initiatives contributing to an integrated management of biodiversity

In Finland it is nationally determined that the regional councils, such as the Uusimaa Regional Council are responsible for preparing development plans for their own regions in cooperation with municipalities and other public and private actors. Careful planning of the use of land and the geographical location of communities and activities is an essential element in the provision of high standards of living, functionality of the physical environment and in sustainable development. Regional land use plans primarily define areas reserved for development, designated green areas, and vital infrastructures including transport routes and municipal services. They also specifically delimit and label certain areas of particular importance for various reasons, including areas within the Natura 2000 network, eskers and other areas with valuable groundwater reserves, landscape conservation areas and other important cultural landscapes. Regional land use plans aim to create and preserve favourable living environments, while also promoting ecologically, economically, socially and culturally sustainable development.

In terms of best practices in the strait Gulf of Finland, there are several projects worthy to be mentioned, e.g. Gulf of Finland Year 2014, which is a **common project composed of Estonian, Russian and Finnish experts**, which created the first opportunity to **analyse in detail the ecological status of the Gulf of Finland**, and TOPCONS, which is a **Finnish-Russian co-operation** project that will develop **innovative spatial tools for the regional planning and long-term invocation of the sea areas**. These will help the society in striving for the marine values and the sustainable consolidation of human activities.

Finally, it is important to note that both sides of the Gulf of Finland are facing administrative body restructuring in the short run, which may also have significant impacts on the measures and actions to be taken for managing and protecting the regional biodiversity in the future.

3.4.2 How responses have addressed key pressures on biodiversity and natural environment

The responses that have been implemented in the Strait are mapped on the following tables.

Table 10: Responses to address risks and pressures exerted on biodiversity and natural environment – Gulf of Finland Strait (1/2)

Activities that take place in the strait	Adding value to the local livelihood			Exerting risks and pressures, and impacting biodiversity and natural environment	Existing responses to address risks and pressures exerted on biodiversity and natural environment		
	Creating jobs	Creating revenues	Creating Identity & culture		Finish side	Estonian side	Cross-border
Maritime transportation	✓	✓		Boat collision and risk of release of hazardous substances transported by boats			• Cross-Gulf transportation
				Invasive species			
				Air / water pollution			• Clean Baltic Sea Shipping (CLEANSHIP)
				<i>All pressures/transversal</i>			• Clean Baltic Sea Shipping (CLEANSHIP) • PENTA • Cross-Gulf transportation • Gulf of Finland Year 2014
Terrestrial transportation				<i>All pressures/transversal</i>			
Fisheries	✓	✓		Fish stock depletion			• Gulf of Finland Year 2014
Agriculture				Reducing biodiversity			
Energy production	✓	✓		Air / water pollution			PRIVATE: • Compliance with the law of the Nordstream structure: gaz pipeline.
Terrestrial/ Coastal tourism	✓	✓	✓	Urban development, artificialisation of land, disturbance of natural balance, destruction of ground vegetation	• Regional Land Use Planning • Sustainable nature tourism guidelines • National Board of Antiquities, Finland		
Maritime tourism	✓	✓	✓	Disturbance of natural balance	• Regional Land Use Planning • Sustainable nature tourism guidelines • National Board of Antiquities, Finland		

Table 11: Responses to address risks and pressures exerted on biodiversity and natural environment – Gulf of Finland Strait (2/2)

	Exerting risks and pressures, and impacting biodiversity and natural environment	Existing responses to address risks and pressures exerted on biodiversity and natural environment		
		Finish side	Estonian side	Cross-border
Urban planning / territorial planning	Artificialisation of land Coastal development, coastal erosion, impact on marine ecosystems	<ul style="list-style-type: none"> Regional Land Use Planning 		
Marine planning				<ul style="list-style-type: none"> Clean Baltic Sea Shipping (CLEANSHIP) PENTA Cross-Gulf transportation TOPCONS Gulf of Finland Year 2014
Improving governance between actors and joint strategies				<ul style="list-style-type: none"> Convention on Environmental Impact Assessment in a Trans-boundary context

3.4.3 Recommendations for future actions

GOVERNANCE

- Although the various cross-border projects have been developed between Finland and Estonia, there is a clear need for improving the cross-border actions and initiatives at the level of governmental organisations in order to identify uniformed actions to react to the increasing environmental pressures on biodiversity and to deal with some common marine management issues. A possible solution to this might be the creation of a **European Grouping of Territorial Cooperation (EGTC)** between the two regional authorities on the two sides of the strait. In this regard, an EGTC convention needs to be created to define the name and registered office, the territory, and the objective and tasks of the EGTC. In the Gulf of Finland, the EGTC could dedicate to the management and implementation of territorial cooperation programs or projects co-financed by the Community through the European Regional Development Fund (ERDF), the European Social Fund (ESF) or/and the Cohesion Fund.
- The current governance structure of the regional council of Uusimaa in Finland is very decentralised, which has resulted in expertise and manpower very scattered for tackling some very technical and complex issues, such as integrated marine planning. The council may improve this aspect by creating some specific working groups in order to allow relevant experts to contribute in a more efficient manner.
- In Estonia, due to the small size of the country, many regional authorities do not have technical experts dealing with marine and environmental issues. However, since marine planning is rather a cross-border issue, the Tarju region may benefit strongly from developing more joint projects with the Uusimaa country that are targeting at spatial maritime planning. Again, the **EGTC** could be a best solution to this.

KNOWLEDGE

- A lack of data in marine protected area in Estonia, is mainly due to the fact that Estonia is in the beginning of making maritime areas spatial planning, with only two ongoing pilots in Hiiu and Pärnu counties. In addition, many statistics and prognosis, such as the Natura 2000 sites are made only at national scale due to the fact that Estonia is too small. Therefore, more research work needs to be done from the Estonian side to improve their database.
- Encourage knowledge sharing between the two sides of the Gulf by developing, updating and sharing a common and cross-border knowledge on: marine biodiversity and environment. In addition, the two regional authorities may consider co-funding a new webportal which can serve as a knowledge center for storing data collected from both sides of the strait on a selected number of subjects, such as environmental and biodiversity inventories.
- Encourage knowledge sharing, not only between Estonia and Finland, but also with other countries around the Baltic Sea, e.g. the Kvarken strait.

This will help building research capacities on biodiversity impact assessment in both Estonia and Finland and in generating knowledge to cope with the increasing human and natural pressures on the biodiversity and ecosystems in the region.

ACTION

- Maritime management. The two regions, together with Russia, may consider developing a common logistic corridor similar to the Nordic Logistic Corridor in the Kvarken strait that manage the transportation and logistics route between Finland, Estonia and Russia. This may help to improve the infrastructure in logistics areas and ports and result in shortened road transport routes, excellent access to intermodal transport (the use of multiple forms of transport for freight and passengers) and modern cargo handling solutions.
- Natural conservation. In terms of protecting the migratory birds, the Gulf of Finland may learn from the successful experience of Baltic Flyway project in the Fehmarn Belt, and engage more nature-oriented organisations from both sides of the Gulf to create better environmental conditions for migratory birds. In particular, the action area shall focus on: (1) cross-border cooperation between the stations and bird sanctuaries; (2) conservation initiatives to promote biological peculiarities here under special conditions of the migratory birds; (3) promotion of adventure opportunities with a focus on migratory birds.
- Transport infrastructure. Although there is a consideration of establishing a fix-link between Helsinki and Tallinn, it is not recommended for two main reasons: (1) extremely high costs to build the longest fixed connections across strait in the world; (2) high impacts as well as uncertainty on the marine and coastal environment.

3.4.4 Towards the implementation of good practices developed by other NOSTRA partners

During the workshop that took place in Reggio Calabria in February 2014, the NOSTRA partners were asked to identify the best practices developed by other partners of the Network they would like to implement in order to achieve their ideal Strait. The partners of the Gulf of Finland chose four best practices.

Towards a “Seascape and Marine spatial planning”

The pilot Seascape Character Assessment (SCA) that the Kent County Council undertook to inform marine spatial planning in the Dover Strait represents indeed an interesting initiative. Such initiative follows the principles of the European Landscape Convention (ELC), which confirms the importance of ‘seascape’. The aims of the ELC are to *“promote landscape protection, management and planning, and to organise European co-operation on landscape issues”*.

Among the many outcomes that a SCA provides, the SCA can be used as a Marine Planning tool. The SCA can contribute towards the requirements of the Marine Strategy Framework

Directive (MSFD) (for instance achieving Good Environmental Status in Europe's seas by 2020).

In the context of the Gulf of Finland, the SCA could help to achieve good environmental status of the area and could result in a spatial framework for decision-making, which will highly support coordination actions. Furthermore, the SCA will provide an assessment of sensitivity as a way of understanding how vulnerable or resilient a seascape is to change. The information contained within a SCA can provide a comprehensive evidence base for assessing sensitivity to change. This will be useful for managing the area and for designing future projects, having in mind the ideal of building logistics roads,

Towards “FLYWAY Project Securing Birds Migration Fehmarn”

The partner of the Uusimaa region expressed an interest for the implementation of an initiative similar to the “FLYWAY Project Securing Birds Migration Fehmarn”. Since Gulf of Finland lies along the main migration route of arctic birds, it makes sense to implement such initiative. Such initiative could support the implementation of monitoring and observatory stations and raise awareness on the ecological status of the area. Moreover, it could promote natural tourism.

Such initiative would be even more successful in the case it would be supported as a cross-border cooperation action.

Towards “Nordic Logistic Corridor Kvarken”

The Nordic Logistic Corridor is a transport and logistics route connecting Norway, Sweden and Finland. It was designed to shorten road transport routes, to develop excellent access to intermodal transport (the use of multiple forms of transport for freight and passengers) and modern cargo handling solutions. In the context of a dense operated sea area, with increasing transport volumes of goods and increasing flows of passengers, and increasing cross-regional economic interaction between the Tallinn-Harju and Helsinki-Uusimaa regions (mainly falling in the following sectors: trade of goods and services, cross-border activities of enterprises), implementing a Logistic Corridor in the Gulf of Finland could be profitable in the socio-economic and environmental fields.

Towards “Fehmarn Fixed Link tunnel”

Since the traffic between the two sides of the strait is very dense, building an immersed tunnel, including both rail and road connections could represent an opportunity to decrease risks of maritime incidents, improve logistics and trade, and support the flows of workers. It would be a relevant alternative to boat and air transportation between the two sides. Implementing such initiative implies a strong cross-border cooperation and collaboration. It would be relevant to establish a formal governing structure at the level of the Strait (as mentioned previously, creating an EGTC) to support jointly such initiative.

3.5 Kvarken Strait

3.5.1 Analysis of the situation at the strait level

The Kvarken Strait is a geographical area which mixes cities, large infrastructures (mainly ports), and remarkable natural areas.

Social-economic background of the Strait

The Kvarken Strait is a strategically important area for maritime transport in the Northern Bothnian Sea. Most of the forest and mining products produced in Northern Sweden and Finland are shipped to the rest of Europe through the narrow Kvarken Strait between Vassa and Umeå. In addition, it is also the one transport line in the Bothnian region that also takes passengers across the strait for tourism, family and business reasons. These specific features of the strait have helped to shape the socio-economic characteristics in the Kvarken region, which is dominated by social services and manufacturing sectors, which contribute to the majority employment of the region, accounting for (SE/FI) 73/63% and 32/30%, respectively. A very small proportion of the population (3/6% - SE/FI) is employed in agriculture and fishery sector.

Significance of biodiversity and natural environment in the Strait

In addition to the busy maritime traffic, the Kvarken strait is also famous for its unique landscape value in terms of the land uplifting caused by the depression created by last ice age. This is also the reason that Kvarken is selected for the UNESCO world cultural heritage sites. Together with the shallow topography characteristics of the Bothnian Sea, the surface area and the depth of the sea are slowly diminishing and more land is being created along the coast. This has essential value for studying the formation of marine and coastal ecosystems in the region. Under the HELCOM convention and with funding supports of the European Commission, various projects have been developed for studying the specific marine and costal biodiversity and ecosystems in the strait, including the EcoChange, SUPERB, SeaGIS, and FLISIK projects. These projects have involved various stakeholders, including universities, research institutes and regional administrative bodies from various countries to investigate together the biodiversity and ecosystems in the Baltic sea, research for solutions to cope with the challenges and pressures that are imposed on the natural environment, and encourage knowledge sharing among different countries in the Bothnian region. Many formal networks between regional governments, such as NOSTRA, were also created to ensure the effective knowledge sharing and conservation of biodiversity in the region.

Human and natural pressures exerted on biodiversity and natural environment

The main pressures exerted on biodiversity and natural environment are coming from maritime transport, onshore agriculture and industrial activities, and discharges of urban sewage water directly to the sea. These activities release water and air pollutants that have already significant impacts on the biodiversity and ecosystem. For instance, it is strictly forbidden by the EU legislation to eat salmon fish harvested from the Bothnian Bay area due to the high concentration of chemical compounds called dioxins found in the salmon body. Moreover, maritime transport poses not only higher risks of an oil spill that could contaminate the sea water, but also invasive species that are carried by the ballast water of the ship. These could all have significant impacts on the endemic species in the region and cause the decline of certain fish and bird species. Moreover, climate change is another essential natural pressure that already has observable impacts on the marine ecosystems in the Baltic Sea. In this regard, EcoChange project was launched with the objectives of improving the understanding of how marine species and ecosystems may react to the changing temperature and studying the coping management strategies that may help ecosystems to adapt to climate change.

Policies, actions and initiatives contributing to an integrated management of biodiversity

The inter-governmental governance of the strait has been well developed through many official cooperation programs between the two countries' regional authorities, e.g. the creation of **Kvarken Council**. The conservation of biodiversity in the strait is mainly subject to the implementation of EU Habitats and Birds directives, which are also reflected in the compliance of creating Natura 2000 protected areas. In addition, in the Baltic Sea area, the most important policy initiative is the signature of the **convention on the Protection of the Marine Environment of the Baltic Sea Area** in 1992 (Helsinki Convention), which is an international convention encompassing various measures for the prevention and elimination of pollution of the Baltic Sea. The Convention sets up a Baltic Marine Environment Protection Commission (HELCOM), whose responsibilities are to implement the Convention, make recommendations to the Parties, define pollution control criteria and objectives and promote additional measures in co-operation with respective governmental bodies of the Parties. The Parties also undertake to implement measures to maintain adequate ability and to respond to pollution incidents in order to eliminate or minimize the consequences of these incidents and regularly report to the HELCOM commission on and inform the general public of the measures taken in accordance with the Convention. These conservation initiatives have already been incorporated into national policies and legislations in Sweden. For instance, in Sweden, special provisions concerning the protection of animal and plant species are found in Chapter 8 of the Swedish Environmental Code (SFS 1998:808) and in the Species Protection Ordinance (SFS 2007:845). The County Administrative Board is the only governance body in charge of marine environment governance. The Finnish environmental legislation is primarily covered through Water act (587/2011); Statsrådets förordning om vattenhushållningsärenden (1560/2011); Environmental Protection Act (86/2000); Environmental Protection Decree (169/2000); Havsskyddslag (1415/1994); Nature Conservation Act (1096/1996) and Land Use and Building Act (132/1999). The governance of marine environment in Finland is divided between two authorities: ELY-keskus and Metsähallitus, both of which receive recommendations from the Finnish Game and Fisheries Research Institute (FGFRI).

3.5.2 How responses have addressed key pressures on biodiversity and natural environment

The responses that have been implemented in the Strait are mapped on the following table.

Table 12: Responses to address risks and pressures exerted on biodiversity and natural environment – Kvarken Strait

Activities that take place in the Strait	Adding value to the local livelihood			Exerting risks and pressures, and impacting biodiversity and natural environment	Existing responses to address risks and pressures exerted on biodiversity and natural environment		
	Creating jobs	Creating revenues	Creating Identity & culture		Ostrobothnia (Finland)	Västerbotten (Sweden)	Cross-border
Maritime Transportation (passing through and crossing)	✓	✓		Boat collision and risk of release of hazardous substances transported by boats			<ul style="list-style-type: none"> NLC CORRIDOR Kvarken Multimodal Link
				<i>All pressures / transversal</i>			
Traditional Fishing	✓	✓	✓	Fish stock depletion (limited)			
Agriculture	✓	✓		Contaminating seawater due to the discharged nutrients			
Terrestrial / Coastal tourism	✓	✓		Urban development, artificialisation of land, disturbance of natural balance, destruction of ground vegetation		<ul style="list-style-type: none"> Supporting the development of in-land tourism 	<ul style="list-style-type: none"> Odyssea France-Italy Maritime The parks' trans-border network (RETRAPARC)
Urban planning / territorial planning				Artificialisation of land Coastal development, coastal erosion, impact on marine ecosystems	<ul style="list-style-type: none"> land use planning governed by the Environmental Protection Act (2000). 	<ul style="list-style-type: none"> specific action plans for endangered species (ÅGP) 	
Improving governance between actors and joint strategies					<ul style="list-style-type: none"> Kvarken Council World Heritage Ambassadors 	<ul style="list-style-type: none"> World Heritage Ambassadors 	<ul style="list-style-type: none"> Many projects are developed developed under the HELCOM convention and within the framework of regional development plans in the European Union, such as the framework of European Grouping of Territorial Cooperation (EGTC), EU INTERREG programme.
Biodiversity and marine conservation related research						<ul style="list-style-type: none"> SUPERB project SeaGIS project FLISIK project 	<ul style="list-style-type: none"> Kvarken Council is cofunding many border-regional projects

3.5.3 Recommendations for future actions

GOVERNANCE

- Centralisation vs. Decentralisation. The opposite governance structures on both sides of the strait may provide inputs for the two countries' regional authorities to learn from each other. For instance, the regional council of Ostrobothnia in Finland may consider to integrate certain level of centralised decision-making process into their currently decentralised the governance structure. This may help the regional governance to grow capacity in terms of tackling some technical issues emerged in the marine and coastal management. On the contrary, the county administrative board of Västerbotten region may also learn from the Finish side to decentralise the governance structure to improve the efficiency in daily operations and allow top management to focus more on major decisions.
- Support the involvement of private sector: The current governance of Kvarken region is mainly subject to public bodies. However, marine biodiversity and ecosystem integration could be more efficient and effective if the regional authorities could modify the governance to promote synergies of public and private interests, and to allow private sectors to recognise the essential value of biodiversity and marine ecosystem in their long-term business sustainability and take corporate social and environmental responsibility into their internal management decisions.

KNOWLEDGE / CAPACITY BUILDING

- Enhance capacity building: The need for enhanced capacity building is foreseen to balance the knowledge sharing between Sweden and Finland. In addition, the Finnish regional authority may consider recruiting more technical experts to strengthen its capacity for developing more integrated marine and coastal management strategies in the region.
- Carry out basin-specific studies: Basin-specific studies are necessary. The Baltic Sea holds a salinity gradient from North to South, due to lack of saltwater inflow and great freshwater inflow in the North. There are also many different basins and sills with varying living conditions in the Baltic Sea. Therefore, it cannot be regarded as uniform water mass.
- Develop knowledge exchange between academic researchers (from the local universities) and regional government officers: In addition to the governmental collaborative projects through the HELCOM convention, more frequent knowledge exchange between academic researchers (from the local universities) and regional government officers may help to strengthen the scientific knowledge regarding the ecological value of biodiversity and identify cost-effective options to cope with climate change in the region.

ACTION

- On the Finnish side, stronger inter-governmental collaboration would be needed to generate collective actions for responding to marine coastal

management issues, including biodiversity conservation and natural reserve management.

- On the Swedish side, actions might be taken to allow for more decentralised decision making in order to react more quickly to emerging environmental issues in the region.
- Government authorities should develop actions plans and guidance to help business sectors to better understand their business independency with marine biodiversity and ecosystems and the benefits that biodiversity can bring to the business, and encourage business to integrate biodiversity value into their management decisions and environmental compliance. Local governmental may need to put more effort to identify new employment opportunities associated with biodiversity and ecosystems in order to develop win-win solutions to prompt both economic growth and biodiversity conservation in the Kvarken region.
- There is a need to build a common sharing database regarding marine biodiversity in the Kvarken strait.

3.5.4 Towards the implementation of good practices developed by other NOSTRA partners

During the workshop that took place in Reggio Calabria in February 2014, the NOSTRA partners were asked to identify the best practices developed by other partners of the Network they would like to implement in order to achieve their ideal Strait. However, the partners of the Kvarken Strait did not submit the best practices they may have chosen.

3.6 Otranto Strait

3.6.1 Analysis of the situation at the Strait level

Socio-economic background of the Strait

The main economic characteristics of the province are a small average size of businesses, and the domination of services and industries. If agriculture does not seem to be one of the major economic sectors, it occupies a transversal role. Tourist activities might partly be correlated to the traditional agricultural landscape. Agritourism is also developing very quickly in the region with the support of local and regional public bodies. Fisheries activities are mainly traditional.

The region is marked by a high unemployment rate. It is nearly 10 points higher than in the rest of Italy. Young populations are particularly affected by this issue.

Significance of biodiversity and natural environment in the Strait

The territory is covered with several European, national, and regional natural reserves that house a high diversity of species and habitats. Terrestrial protected areas represent 5% of the province territory (16,654 ha). Marine protected areas represent 14,702 ha. The natural environment is largely present in the traditional practices and the cultural heritage of the province. The traditional ports that speckle the coast and the “sagre”, customs taking place throughout the year, are evidence to this fact.

Human and natural pressures exerted on biodiversity and natural environment

The main human activities exerting pressures on the environment might be tourism and waste generation. The presence of infrastructure directly responsible for the artificial ground cover can also have a sensible impact. In particular, many military basements are present in the province of Lecce.

The area also faces intense natural erosion, due to strong winds. The answers to this natural pressure on the local environment must be sought through engagement at the regional, national, or transnational levels.

Policies, actions and initiatives contributing to an integrated management of biodiversity

European initiatives covering the Italian side

Several Policies are relevant to the management and protection of natural resources. The aim of the local, national, and European policies is to reduce the impact of human activities, and to possibly develop sustainable strategies for local development. The Marine Strategy framework is an initiative of the EU and allows reconciling the principle of sustainable management of fisheries resources and the socio-economic and territorial imperatives of fishing activities. The European network Natura 2000 protects species of community interest. The area is rich with migratory bird species, some of which are protected by this European network. On a broader range, the European strategy for the Adriatic and Ionian Regions is to promote the economic and social prosperity of the region by improving its attractiveness, competitiveness and connectivity. This strategy is built upon marine development, accessibility, and economic sustainable development.

There is a lack of competent authorities to take on responsibilities when environmental damage occurs in international waters.

Cross border initiatives covering for economic development

The Adriatic Instrument for Pre-Accession Assistance was running from 2007 to 2013, and was conceived in order to facilitate the cooperation between Greece, Italy, Slovenia, Albania, Bosnia and Herzegovina, and Croatia. It represents the continuation of the INTERREG program that included specific elements for the cooperation of Italy and Albania. The tool for international cooperation in the region for the coming period is under discussion. The goals should be similar: "strengthening sustainable development capabilities in the Adriatic region".

Local initiatives for sustainable development and protection of the natural environment

Several initiatives show the local interest for the protection of the natural environment. The regional nature figures heavily in the local identity and traditional practices, and now appears as well to be a source of economic development and well-being. The presence of several regional and national parks allow for both protecting local species and valuing the natural capital by the touristic industry. The identification of the needs for innovation in agriculture, based on sustainable practices, also shows a desire to improve the economic development of the region by integrating and respecting natural characteristics. It is interesting to note that marine resources receive particular attention regarding both their protection and in the valuation of their

economic potential. Institutions are in charge of the observation and the protection of the natural environment. In particular, the Fauna Observatory and the Wildlife Recovery Centre collect data, while the Regional Agency for Irrigation and Forestry activities is in charge of the management of the water resource and the protection of sensible areas from fire.

Governance

There is a variety of actors in Italy involved in issues related to natural environment and biodiversity, with a large distribution of competencies among them. There is no formal structure between Albania and Italy, but cross-border cooperation actions have been engaged.

3.6.2 How responses have addressed key pressures on biodiversity and natural environment

The responses that have been implemented in the Strait are mapped on the following tables.

Table 13: Responses to address risks and pressures exerted on biodiversity and natural environment – Otranto Strait (1/2)

Activities that take place in the Strait	Adding value to the local livelihood			Exerting risks and pressures, and impacting biodiversity and natural environment	Existing responses to address risks and pressures exerted on biodiversity and natural environment		
	Creating jobs	Creating revenues	Creating Identity & culture		Italian side (Provincia di Lecce)	Albanian Side	Cross-border
Maritime Transportation (through the strait)				Boat collision and risk of release of hazardous substances transported by boats	<ul style="list-style-type: none"> • Legislation compliant with the International Regulations for Preventing Collision at Sea 	n/a	
				<i>All pressures/ transversal</i>		n/a	
Traditional Fishing	✓	✓	✓	Fish stock depletion	<ul style="list-style-type: none"> • Common Fisheries Policy • The Fauna observatory, wildlife recovery Centre 	n/a	<ul style="list-style-type: none"> • The Adriatic Instrument for Pre-Accession Assistance
Agriculture	✓	✓	✓	Reducing biodiversity	<ul style="list-style-type: none"> • Strategy for the development of a sustainable agriculture • Maritime strategy for the Adriatic and Ionian seas (MSAIS) • The Fauna observatory, wildlife recovery Centre • Census of Monumental Olive-trees in Puglia • Study valuating the need for innovation in Puglia 	n/a	
Terrestrial/ Coastal tourism	✓	✓	✓	Urban development, artificialisation of land, disturbance of natural balance, destruction of ground vegetation	<ul style="list-style-type: none"> • Guidelines and studies for the intervention on the low coasts of Puglia • Regional parks and natural reserves • OECD LEED policy on "sustainable tourism and local development in Apulia region" 	n/a	
Maritime tourism / Leisure	✓	✓	✓	Disturbance of natural balance	<ul style="list-style-type: none"> • The Fauna observatory, wildlife recovery Centre • OECD LEED policy on "sustainable tourism and local development in Apulia region" 	n/a	

Table 14: Responses to address risks and pressures exerted on biodiversity and natural environment – Otranto Strait (2/2)

Activities that take place in the strait	Exerting risks and pressures, and impacting biodiversity and natural environment	Existing responses to address risks and pressures exerted on biodiversity and natural environment		
		Italian side (Provincia di Lecce)	Albanian Side	Cross-border
Urban planning / territorial planning	Artificialisation of land, Coastal development, coastal erosion, impact on marine ecosystems	<ul style="list-style-type: none"> • EU Strategy for the Adriatic and Ionian Region – EUSAIR • Regional agency for irrigation and forestry activities (ARIF) 	n/a	<ul style="list-style-type: none"> • The Adriatic Instrument for Pre-Accession Assistance
Marine planning		<ul style="list-style-type: none"> • EU Strategy for the Adriatic and Ionian Region – EUSAIR • Guidelines and studies for the intervention on the low coasts of Puglia 	n/a	
Improving governance between actors and joint strategies		<ul style="list-style-type: none"> • Guidelines and studies for the intervention on the low coasts of Puglia 	n/a	<ul style="list-style-type: none"> • The Adriatic Instrument for Pre-Accession Assistance

3.6.3 Recommendations for future actions

GOVERNANCE

- Implement a unique structure that could represent the Strait at International, European and National levels.
- Give long term perspectives to the cooperation between countries of the Adriatic (EU and non EU member states)
- Develop tools for the cooperation at the scale of the regional or provincial scale
- Clarify governance in charge of taking decisions on biodiversity-related issues and implementing actions
- Develop a network of actors gathering public institutions, private sectors, and researchers in each key sector
- Develop cooperation between Albania and Italy in the framework of technical initiatives
- Develop a formal structure to work on the responsibilities of actors in the case of damage on biodiversity and natural environment in international waters.

KNOWLEDGE

- Develop, update and share a common and cross-border knowledge on:
 - Biodiversity and natural environment (e.g. complete and share on-going inventories);
 - The impacts of human and natural pressures on biodiversity and natural environment.
- Clarify pressures exerted on biodiversity and natural environment and related impacts.
- As a priority, clarify the pressures responsible for coastal erosion. Furthermore, the intensity of maritime traffic and its impact on natural resources has not been assessed.
- Specify the impacts of tourism on the coastal and inner environment.

ACTION

- Share experience and best practices between cross-border partners
- Enhance the promotion of jobs and training and the identification of job opportunities in relation to the integrated management of biodiversity and natural environment, with cross-border partnerships, for instance in the

following sectors: marine transport, tourism, local planning, fisheries, and agriculture.

- Duplicate the work with local communities in natural protected areas to develop local benefits and at the same time increase protection of biodiversity.

3.6.4 Towards the implementation of good practices developed by other NOSTRA partners

During the workshop that took place in Reggio Calabria in February 2014, the NOSTRA partners were asked to identify the best practices developed by other partners of the Network they would like to implement in order to achieve their ideal Strait. The partners of the Otranto Strait expressed their interest for the following best practices.

Towards “EGTC Action plan for Biodiversity Preservation”

Biodiversity is a challenge for the Otranto Strait. If actions and initiatives have been taken on the Italian side, fewer actions to date have been implemented in the Albanian side. Moreover the scope of the actions taken by the Italian side of the Strait and the related outcomes may be reduced due to a lack of consistent actions implemented on the Albanian Side. The priority is to engage a joint action plan to preserve biodiversity. To ensure the decision-taking process and the definition of roles and responsibilities to manage biodiversity, establishing a formal joint dedicated structure is a relevant idea.

Towards “CAST (Coastal Actions for Sustainable Tourism)”

The CAST project implemented in the Dover Strait aims to strengthen coastal tourism by identifying new opportunities to attract and retain visitors and improve products and services while guaranteeing the sustainability of tourism. It would be an interesting initiative to develop this important economic activity in a sustainable manner on the Albanian and Italian Coasts, in a cooperative work, searching for common innovations and solutions to improve product, quality, communication, marketing and research are vital. The project focused on a joint analysis of the area, common marketing actions, and a pilot study in coastal management. They strive to change perceptions through tools such as jointly branded campaigns, study trips, joint website about coastal activities. However, in the case of the Otranto Strait, the initiative must integrate the issue of valuing inland areas, in order to decrease the pressure of tourism on the coasts.

Towards “Kvarken Council Joint governance”

The Kvarken Council is a cross-border cooperation association formed by public authorities from Finland and Sweden. It has had approximately 100 different cooperation projects in infrastructure, communications, tourism, university cooperation, food, business, education, culture, etc.

In the case of the Otranto Strait, initiatives have been taken to increase cooperation and joint actions between the two sides of the strait, but there is no formal structure between Albania and Italy. Implementing a formal structure inspired by the example of the Kvarken Council would be a step ahead towards further cooperation.

3.7 Strait of Messina

3.7.1 Analysis of the situation at the strait level

Socio-economic background of the Strait

The economic added value per sector shows the importance of the services sector (80.4%), comprising mainly commercial activities, legal and administrative consulting, public administration, mobility and logistics. About 4.5% of the economic activity is due to agriculture, 15.2% from industry (mainly manufacturing and construction).

The main aim of the strait's mobility is an integrated type of mobility combining all four modes of transport – road, railway, ports and airports– which can guarantee a continuity lacking today and can contribute to the creation of a gateway to national and European markets.

In this sense the “Sea Highway”, particularly the fast link between Messina and the Airport of the Strait in Reggio Calabria, plays a significant role in reinforcing the connection between the two shores as well as making this area more accessible to tourists. The strategic position of the strait at international level represents a key value to transform this area into a logistics platform in the local-global relations.

Accordingly to the local authorities, from the touristic point of view, the Messina strait could be further valued.

Significance of biodiversity and natural environment in the Strait

The intense hydrodynamism and the chemical characteristics of the strait's waters affect the entire environment to the point of creating an extraordinary ecosystem, which is unique in the Mediterranean Sea for its biocenosis and abundance of species. This is why the Strait of Messina constitutes a unique source of biodiversity.

Human and natural pressures exerted on biodiversity and natural environment

Strong pressures on biodiversity exist in the area: marine transport towards the harbour in Gioia Tauro, fishing using illegal fishing tools (long nets), insufficient treatment of wastewater (not efficient or non-existing), illegal construction of buildings on the coast, salt production, soil erosion, and luminous and noise disturbance. The project of a bridge on the strait, if approved, will have important impacts on the marine ecosystem, notably because of the shadow projected on the water, being a contradictory signal for fishes in migration.

The presence of invasive species related to maritime transport and aquaculture activities has been identified as a ‘pressure’ on biodiversity in the strait. However, no information is provided in the toolkit regarding the specific concerned species (only one example given: *Caulerpa taxifolia*).

Policies, actions and initiatives contributing to an integrated management of biodiversity

The Messina city hall decided to start a procedure to include this area in the UNESCO world heritage list. Since the procedure is expected to be very long and complex, the city administration has sent a partnership request to other involved towns and cities (including

Reggio Calabria), but also the airport authority, the ports authorities, to the local University and Research centre and several NGOs.

The EU project ODISSEA was developed to ensure the EMAS certification of a number of town-villages which did not continue to work in this direction once the authorisation was obtained. The project was aimed towards environmental restoration, and sustainable development of standpoint, the axis of tyrrhenian coast -Aspromonte included in the municipalities of Reggio Calabria, Santo Stefano in Aspromonte, Scilla and San Roberto.

One of the agreements that has been put into practice is the creation of the Strait of Messina Maritime Authority, which is responsible for security, surveillance and monitoring of maritime traffic. The Province of Messina and the Province of Reggio Calabria, in terms of governance can play an important role in bringing a significant political change thanks to projects aimed at creating «The Strait Region».

3.7.2 How responses have addressed key pressures on biodiversity and natural environment

The responses that have been implemented in the Strait are mapped on the following tables.

Table 15: Responses to address risks and pressures exerted on biodiversity and natural environment – Strait of Messina (1/2)

	Adding value to the local livelihood			Creating risks and pressures, and impacting biodiversity and natural environment	Existing responses to address risks and pressures exerted on biodiversity and natural environment		
	Creating jobs	Creating revenues	Creating Identity & culture		Calabrian side	Sicilian side	Cross-border
Maritime Transportation (crossing)	✓	✓		Boat collision and risk of release of hazardous substances transported by boats	• Legislation compliant with the International Regulations for Preventing Collision at Sea		• The Strait of Messina Maritime Authority
				<i>Invasive species</i>			
				<i>All pressures / transversal</i>			• Sustainable practices of the ferry boat company
Fishing	✓	✓		Fish stock depletion			
Agriculture	✓	✓	✓	Reducing biodiversity			
Terrestrial / Coastal tourism	✓	✓		Urban development, artificialisation of land, disturbance of natural balance, destruction of ground vegetation			
Maritime tourism	✓	✓		Disturbance of natural balance			
				Invasive species			
Urbanisation / building	✓	✓		Artificialisation of soils, soil erosion, limitation of water infiltration			
Cultural heritage			✓			Procedure to include the area in the UNESCO world heritage	

Table 16: Responses to address risks and pressures exerted on biodiversity and natural environment – Strait of Messina (2/2)

	Creating risks and pressures, and impacting biodiversity and natural environment	Existing responses to address risks and pressures exerted on biodiversity and natural environment		
		Calabrian side	Sicilian side	Cross-border
Urban planning / territorial planning	Artificialisation of land Coastal development, coastal erosion, impact on marine ecosystems			
Marine planning				
Improving governance between actors and joint strategies				<ul style="list-style-type: none"> • Integrated development in the context of the European Straits Initiative • the Strait of Messina Maritime Authority

3.7.3 Recommendations for future actions

GOVERNANCE

- The heterogeneity of the governance is notably due to a lack of integration between terrestrial (Province) and marine (Harbour authorities) management. Preferably, a single entity for strait management should be created.
- Via the NOSTRA project, the EU could help by starting coordination at the local level. Initiatives may include aid for training local youths to recognise the cultural and natural heritage of the area as something to be valued and developed, and helping young people to join the local authorities bringing with them a fresh and different view.

1.1.1 Towards the implementation of good practices developed by other NOSTRA partners

During the workshop that took place in Reggio Calabria in February 2014, the NOSTRA partners were asked to identify the best practices developed by other partners of the Network they would like to implement in order to achieve their ideal Strait. However, the partners of the Messina Strait did not submit the best practices they may have chosen.

3.8 Strait of Sicily

3.8.1 Analysis of the situation at the strait level

Socio-economic background of the Strait

Major activities in the area are the extraction of marble, tourism (many important archaeological hotspots), fishery (traditionally tuna fish now transferred to Japanese investors), salt extraction and agriculture, mainly wine (80% of the Sicilian production) and oil (mainly SMEs). Commercial activities are the most present in the area, especially in the city of Trapani, while touristic infrastructures and restaurants are strongly influenced by the seasonality of tourism and are less developed (about 500 enterprises in the area).

Significance of biodiversity and natural environment in the Strait

Several protected areas exist in the area and in addition to the Natura 2000 network including (in Italian): La Riserva dello Zingaro, il Monte Bonifacio, Lo Stagnone, la riserva del Belice e Favigna, which are a very strong tourist attractions.

The wide variety of marine habitats, and notably the Posidonia prairies, contributes to the high level of biodiversity in this area, which is also characterised by the presence of fish species highly requested by consumers.

Human and natural pressures exerted on biodiversity and natural environment

The recent participation of Trapani's province territory to the Natura 2000 network has influenced the dismissing of the marble's extraction activity for conservation reasons. For the same reasons and due to general public mobilisation, the wind energy production and petrol extraction activities in the straits have been stopped and dismantling of illegal buildings on the beach is now planned. The relative importance of the fishery activities on the area is relatively small in terms of job creation (only 2.1% of the workers in the area are employed in this sector). However this number does not consider job creation related to the transformation of sea products. In the last 40 years, the technological innovation of the fishery techniques and the growth of the demand have influenced the excessive exploitation of the marine resources in the area.

3.8.2 How responses have addressed key pressures on biodiversity and natural environment

The responses that have been implemented in the Strait are mapped on the following tables.

Table 17: Responses to address risks and pressures exerted on biodiversity and natural environment – Strait of Sicily

	Adding value to the local livelihood			Creating risks and pressures, and impacting biodiversity and natural environment	Existing responses to address risks and pressures exerted on biodiversity and natural environment	
	Creating jobs	Creating revenues	Creating Identity & culture		Italian side (Sicily)	Cross-border
Maritime Transportation (crossing)	✓	✓		Boat collision and risk of release of hazardous substances transported by boats	• Legislation compliant with the International Regulations for Preventing Collision at Sea	
				<i>All pressures/transversal</i>		
Traditional Fishing	✓	✓	✓	Fish stock depletion (limited)	• The Coastal Action Group	• ENPI CBC Italy-Tunisia Program
Agriculture	✓	✓	✓	Reducing biodiversity		• ENPI CBC Italy-Tunisia Program
Saltmarshs	✓		✓	<i>All pressures/transversal</i>		
Terrestrial/ Coastal tourism	✓	✓		Urban development, artificialisation of land, disturbance of natural balance, destruction of ground vegetation	• The Coastal Action Group	• ENPI CBC Italy-Tunisia Program
Maritime tourism	✓	✓		Disturbance of natural balance		• ENPI CBC Italy-Tunisia Program

3.8.3 Recommendations for future actions

GOVERNANCE

- There is a lack of planning and coordination instruments targeting the management of private and public funding. An integrated EU management of straits could help in this specific context to eliminate some blocking points. However, the specific position of the strait (Italy-Africa) and the difficult relationship with the Tunisian authorities very rigid concerning the marine national areas are a key issue of the area, notably in terms of fishing practices since EU and Tunisia do not share the same legislative approach concerning fishery in international marine areas. To solve the situation and to have an integrated management it would be needed to have international agreements, lacking at the moment. At a more local level, there is a lacking of entities for the environmental certification of fishery products and an integrated network to promote tourism.

3.8.4 Towards the implementation of good practices developed by other NOSTRA partners

During the workshop that took place in Reggio Calabria in February 2014, the NOSTRA partners were asked to identify the best practices developed by other partners of the Network they would like to implement in order to achieve their ideal Strait.

The partners of the Strait of Sicily expressed interest for the following best practices.

Towards “Scenario for sustainable socio-economic development_VIora”

Building scenario for sustainable socio-economic development for the territory of the Sicilian coast of the Strait of Sicily will support the integration of biodiversity in local planning and socio-economic development of the area.

Towards “CAST_Coastal Actions for Sustainable Tourism_Kent”

The CAST project implemented in the Dover Strait aims to strengthen coastal tourism by identifying new opportunities to attract and retain visitors and improve products and services while guaranteeing the sustainability of tourism. To date, the Sicilian coast of the Strait of Sicily is not well developed for tourism, while at the same time it suffers from high seasonality of tourism. Implementing such initiative aiming at promoting tourism and preserving biodiversity and natural environment is relevant in the context of the Strait of Sicily.

EGTC Action plan for Biodiversity Preservation

The Sicilian channel between Sicily and Tunisia joins the west and east Mediterranean basins, and hosts many species. It represents a biodiversity hotspot within the Mediterranean. It seems relevant to engage a joint and cross-border management of biodiversity and to implement actions to preserve biodiversity. A formal dedicated structure will clarify roles and responsibilities, the decision-making process and the scope of actions. The challenges of biodiversity preservation must be taken as a cross-border issue.

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