Article 12 Technical Assessment
of the MSFD 2012 obligations
Slovenia

7 February 2014

Final version
DISCLAIMER:

The opinions expressed in this document are the sole responsibility of the authors and do not necessarily represent the official position of the European Commission.

The main authors of this report are Claire Dupont, Alice Belin, Bastiaan Vermonden and Goncalo Moreira with contributions from Sabine Cochrane, Lindsay Wilson and Chris Emblow (D1, 4, 6), Belinda Kater (D2), Sophie Des Clercs (D3), William Parr (D5), Christophe Le Visage (D7), Norman Green (D8 and 9), Jan Cools (D10) and Frank Thomsen (D11). This report is provided under Contract No 070307/2012/634823/SER/D2 – Task F.

Milieu Ltd. (Belgium), 15 rue Blanche, B-1050, Brussels, tel: 32 2 506 1000; Fax 32 2 514 3603; e-mail: claire.dupont@milieu.be and alice.belin@milieu.be; web address: www.milieu.be
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Section 1. Introduction and cross cutting issues

Overall approach
Slovenia has uploaded the reporting sheets at various dates, as follows:
- Article 8, features, pressures – 14 May
- Article 8, ESA – 25 January
- Article 10, targets – 26 April
- Article 9, GES – 26 April

The paper report has been uploaded on 25 January and 15 April 2013. It consists of several preparatory documents and background studies and four main documents officially signed and issued by the Minister of Environment: 1) initial assessment – main features and characteristics, 2) initial assessment – predominant pressures and impacts, 3) ESA, 4) GES and environmental targets. There are sometimes discrepancies between the paper report and the reporting sheets; when the differences were more substantial, as a rule, the assessment was based on the reporting sheets (for definitions, the more comprehensive version was used, e.g. GES for Descriptor 5).

The approach used to define GES varies. For some descriptors GES is defined at descriptor level (Descriptors 7, 9 or 10), in other cases is defined at both descriptor and criteria level (Descriptors 1, 4, 5 and 8) and in the remaining cases at criteria level only (Descriptors 2, 6 and 11). Finally Descriptor 3 is defined only at indicator level.

The initial assessment is mainly descriptive but there is a fair attempt to quantify some elements. Judgements on the current status in relation to GES are not consistently made.

Slovenia has set environmental targets for all descriptors. For some descriptors, the targets are divided in “environmental objectives” (focused on the reduction of pressures or impacts) and “operational objectives” (e.g. focused on the development of indicators or the gathering of information). Many of the environmental targets are interim ones, with various elements still to be developed e.g. method for assessment, baseline and proportion of areas affected.

Scope of marine waters
Slovenia marine waters include the seabed and subsoil on the seaward side of the baseline from which the extent of territorial waters (12 nautical miles) is measured. Slovenia notes that the limit of the continental shelf of the Republic of Croatia will be determined by an international agreement between the two countries. This is linked to the on-going dispute with Croatia concerning the maritime boundary between the two countries in the Gulf of Piran. An Arbitration Agreement between the Government of the Republic of Slovenia and the Government of the Republic of Croatia was signed on 4 November 2009 and entered into force on 29 November 2010, which in Article 3 stipulates the tasks of the Arbitration Tribunal. The Arbitration Tribunal shall, among other, determine the course of the maritime boundary between the Republic of Slovenia and the Republic of Croatia, Slovenia's junction to the High Seas and the regime for the use of the relevant maritime areas.

Slovenia marine waters are part of the marine sub-region of the Adriatic Sea. No formal subdivisions have been made.

Assessment areas and aggregation scales
Slovenia’s initial assessment, characteristics of GES and associated targets and indicators have been developed for the Slovenian marine waters as a whole.

Regional Cooperation
Slovenia is party to the Barcelona Convention. Slovenia reports the participation in five meetings at regional level for coordination of approaches for the initial assessment and definition of GES, with
Italy and Croatia, and the establishment of environmental targets, with Italy. In relation to the initial assessment, it is reported that the common work is still in an initial stage; as for GES and environmental targets, Slovenia indicates that the discussion focused on D5, D9, D10 and D11 but that no conclusive arrangements were agreed yet.

**Socio-economic analysis**
The economic and social analysis of marine uses for Slovenia has been carried out using the water accounts approach and Slovenia has followed an ecosystem services approach to evaluate the cost of degradation. For both assessments, a number of economic sectors related to the use of marine waters are listed and a qualitative and quantitative description of each activity is provided.

**Data and knowledge gaps**
While data and knowledge gaps are generally identified and described, the plans to address these gaps are usually quite vague and without details of timescale or responsibilities.
## Section 2. Summary of the assessment

The table presents a summary of the assessment, using the following keys:

<table>
<thead>
<tr>
<th>Keys</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>+++</td>
<td>Good practice (can be attributed to one individual criterion)</td>
</tr>
<tr>
<td>++</td>
<td>Adequate</td>
</tr>
<tr>
<td>+</td>
<td>Partially adequate</td>
</tr>
<tr>
<td>-</td>
<td>Inadequate</td>
</tr>
<tr>
<td>0</td>
<td>Not reported</td>
</tr>
</tbody>
</table>

### Table

<table>
<thead>
<tr>
<th>D1</th>
<th>GES Assessment</th>
<th>Initial assessment Criteria</th>
<th>Targets Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>- GES defined for all criteria (although uncertain if criterion 1.3 is fully covered)</td>
<td>Pressures:</td>
<td>- SMART targets and indicators</td>
</tr>
<tr>
<td></td>
<td>- Species covered by GES definition only listed/protected species</td>
<td>- The different types and causes of physical loss are reported but the information is limited</td>
<td>- Focus on compliance with existing legislation and agreements</td>
</tr>
<tr>
<td></td>
<td>- Coverage of habitats is broader</td>
<td>- Mainly qualitative (even though the proportion of areas/habitats impacted is given)</td>
<td>- Not full coverage of all biodiversity components covered in the GES definition</td>
</tr>
<tr>
<td></td>
<td>- Quantitative threshold values and baselines defined for habitats criterion</td>
<td>- No trends or judgements have been provided</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Reference to relevant EU legislation and regional and international agreements</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Ecosystem covered in a holistic manner</td>
<td>Features:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Use of the IA as a baseline</td>
<td>- Information is mainly qualitative but covers most habitat types and functional/species groups (although not always in great detail)</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Trends and judgements on status are provided in some cases</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D2</th>
<th>GES Assessment</th>
<th>Initial assessment Criteria</th>
<th>Targets Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>- GES defined at criteria level but in a very broad and imprecise way</td>
<td>- List of invasive NIS provided</td>
<td>- Not fully SMART, due notably to lack of specifications</td>
</tr>
<tr>
<td></td>
<td>- The minimum requirements are not reflected</td>
<td>- Information on the level of pressure</td>
<td>- No associated indicators</td>
</tr>
<tr>
<td></td>
<td>- Baseline not clearly set</td>
<td>- Judgement of the status in relation to GES</td>
<td>- Targets sufficiently ambitious and consistent as a set</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>- No assessment of impacts</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Knowledge and data gaps identified with one of the targets aiming at monitoring of most vulnerable areas</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D3</th>
<th>GES Assessment</th>
<th>Initial assessment Criteria</th>
<th>Targets Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>- All stocks to be exploited at Fmsy or E0.4</td>
<td>- Fleets assessed</td>
<td>- Targets vague</td>
</tr>
<tr>
<td></td>
<td>- Criterion 3.3 has been applied and a threshold has been applied to indicator 3.3.3 (+++)</td>
<td>- Fishing effort assessed</td>
<td>- Unclear whether stocks will be exploited at Fmsy</td>
</tr>
<tr>
<td></td>
<td>- Not clear whether all stocks should be at or above SSBmsy</td>
<td>- Commercial species assessed but not in relation to MSY or PA reference points</td>
<td>- Targets not fully completed</td>
</tr>
<tr>
<td></td>
<td>- Secondary indicator for criterion 3.2 is incorrectly applied</td>
<td>- Impacts of fisheries are not assessed</td>
<td>- Positive target regarding recreational fisheries</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>See D1.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>D4</th>
<th>GES Assessment</th>
<th>Initial assessment Criteria</th>
<th>Targets Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>- Coverage only of criteria 4.2 and 4.3, 4.1 is not covered</td>
<td>See D1.</td>
<td>- Only one state target, the other three targets are research/data collection</td>
</tr>
<tr>
<td>Assessment</td>
<td>Criteria</td>
<td>Initial assessment</td>
<td>Targets</td>
</tr>
<tr>
<td>------------</td>
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<td>---------</td>
</tr>
<tr>
<td>D5</td>
<td>++</td>
<td>- Qualitative and quantitative information on all the relevant nutrients and organic matter in terms of loads and concentrations</td>
<td>++</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The main causes of pressure are identified and most impacts are addressed (but not on macrophytobenthos)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Trends and judgements are provided</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>+</strong></td>
<td></td>
</tr>
<tr>
<td>D6</td>
<td>-</td>
<td>- Lack of thresholds and baselines</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Qualitative and quantitative information on all the relevant nutrients and organic matter in terms of loads and concentrations</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- The main causes of pressure are identified and most impacts are addressed (but not on macrophytobenthos)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Trends and judgements are provided</td>
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</tr>
<tr>
<td>D7</td>
<td>-</td>
<td>- Lack of thresholds and baselines</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Qualitative and quantitative information on all the relevant nutrients and organic matter in terms of loads and concentrations</td>
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<tr>
<td></td>
<td></td>
<td>- The main causes of pressure are identified and most impacts are addressed (but not on macrophytobenthos)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Trends and judgements are provided</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>+</strong></td>
<td></td>
</tr>
<tr>
<td>D8</td>
<td>+</td>
<td>- Assessment very limited, referring only to a limited number of sources of contaminants and to a few substances</td>
<td>+</td>
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<tr>
<td></td>
<td></td>
<td>- Almost no quantifiable information on loads or concentrations of substances or the impacts of these in the environment</td>
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<tr>
<td></td>
<td></td>
<td>- Judgements refer to Regulation 1881/2006, relevant for human consumption purposes but not adequate for environmental protection</td>
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<td></td>
<td></td>
<td><strong>+</strong></td>
<td></td>
</tr>
<tr>
<td>D9</td>
<td>+</td>
<td>- Limited assessment (limited number of substances assessed and only one measurement)</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Judgement made in relation to Regulation 1881/2006</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Assessment of contamination of shellfish waters by microbial pathogens</td>
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<td><strong>+</strong></td>
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<tr>
<td>GES</td>
<td>Initial assessment</td>
<td>Targets</td>
<td></td>
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<tr>
<td>Assessment</td>
<td>Criteria</td>
<td>Assessment</td>
<td>Criteria</td>
</tr>
<tr>
<td>D10</td>
<td>+</td>
<td>- No coverage of indicator 9.1.2 on the frequency of regulatory levels being exceeded</td>
<td>+</td>
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<td></td>
<td></td>
<td>+</td>
<td>- Qualitative definition but trend-based</td>
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<td></td>
<td></td>
<td></td>
<td>- Reference to D1, 4 and 6</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Impacts listed in qualitative way</td>
</tr>
<tr>
<td></td>
<td>++</td>
<td>- Information reported is adequate in light of current state of knowledge</td>
<td>++</td>
</tr>
<tr>
<td>D11</td>
<td>+</td>
<td>- Data gaps are acknowledged</td>
<td>- Information both qualitative and quantitative</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Trends and judgements provided only for beaches</td>
<td>- Limited information on impacts</td>
</tr>
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<td></td>
<td></td>
<td>+</td>
<td></td>
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<td></td>
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<td>- Two targets out of four are potentially SMART but lack threshold and therefore are not ambitious</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- They may be sufficient to achieve GES since GES is qualitative</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Two other targets are research/monitoring targets</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- No thresholds and baselines have been provided</td>
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<td></td>
<td></td>
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<td>- Not measurable and therefore noncommittal</td>
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<td>- Not sufficient to ensure that an ambient noise measurement campaign will take place</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- Not measurable and therefore noncommittal</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Not sufficient to ensure that an ambient noise measurement campaign will take place</td>
</tr>
</tbody>
</table>
Section 3. D1, D4 and D6 (Biodiversity)

I. Good Environmental Status (GES)

1.1 Descriptor 1

<table>
<thead>
<tr>
<th>Definition of GES (paper report and reporting sheet):</th>
</tr>
</thead>
</table>

1.1. Species distribution is in accordance with the baseline as described in the initial assessment (2012), or in accordance with other directives.

1.2. Species distribution is in accordance with the baseline as described in the initial assessment (2012), or in accordance with other directives.

1.3. Species distribution is in accordance with the baseline as described in the initial assessment (2012), or in accordance with other directives.

1.4. The extent and distribution of habitats is in accordance with natural conditions. Habitats provide living space for all functional groups under natural conditions. Diversity within functional groups is maintained. Rare and threatened habitats are adequately protected and preserved. Good condition is associated with descriptor D5.

1.5. The extent and distribution of habitats is in accordance with natural conditions. Habitats provide living space for all functional groups under natural conditions. Diversity within functional groups is maintained. Rare and threatened habitats are adequately protected and preserved.

1.6. The extent and distribution of habitats is in accordance with natural conditions. Habitats provide living space for all functional groups under natural conditions. Diversity within functional groups is maintained. Rare and threatened habitats are adequately protected and preserved.

1.7. The extent and relative proportions of ecosystem components are in accordance with natural conditions.

Slovenia has defined GES for Descriptor 1 at the descriptor and criteria level in the reporting sheets and only at criteria level in the paper report. The first definition for D1, which refers to the maintenance of “Good Status” according to the Water Framework Directive (WFD) and to “Favourable status” according to the Habitats and Birds Directives, is not reproduced in the paper report.

Slovenia has defined GES in the same way for criteria 1.1, 1.2 and 1.3 (the “species” criteria). The definition addresses species distribution (1.1) but does not directly address population size (1.2) and condition (1.3). In the accompanying text, in the paper report, Slovenia refers to “species distribution, population size and conservation”. It is not clear however that “conservation” is appropriate to cover “condition”.

In the reporting sheet, Slovenia does not include any species or functional groups in the features addressed by the GES definitions for criteria 1.1 to 1.3. In the accompanying text to the GES definition, Slovenia provides a list of the species that are covered by the GES definition. This includes the bottlenose dolphin (*Tursiops truncatus*), the loggerhead sea turtle (*Caretta caretta*), the common tern (*Sterna hirundo*) and the little tern (*Sternula albifrons*). This covers turtles, only one species of marine mammals and only two species of birds. It does not cover any fish species or cephalopods. Slovenia justifies the choice of these species by mentioning that they are covered by regulations (the terns by the Birds Directive, the dolphins and turtles by the Habitats Directive). The list of species
selected by Slovenia includes only protected/listed habitats, meaning that the GES definition does not address all marine species equally.

Threshold values, reference point type and baselines are not mentioned for criteria 1.1 to 1.3. The GES definition set a goal to be in “accordance with baselines as described in the initial assessment (2012) or in accordance with other directives”. It is not clear whether the baseline state of the IA is assumed to be at GES, i.e. using the concept of no further decline. It is also not clear which directives are addressed by the GES definition but presumably it relates to the Birds and Habitats Directives.

Slovenia has defined GES almost the same way for criteria 1.4 (habitat distribution), 1.5 (habitat extent) and 1.6 (habitat condition). For criterion 1.4, it has added a condition that “good condition” is related to Descriptor 5 (presumable to the definition of GES for D5). The definition addresses the habitats’ extent and distribution. In the accompanying text, Slovenia specifies which habitats are covered by the GES definition. This includes rocky bottom in the lower intertidal, sediment in the bottom of the left lower intertidal, solid infralittoral and circalittoral, sedimentary bottom infralittoral and circalittoral and habitat types in the water column. Zooplankton is also referred to in the reporting sheet. In addition, a number of features are reported as part of the species but are actually more relevant under habitats. This includes coral rock (Cladocora caespitosa), seagrass (Posidonia oceanica) and Cymodocea nodosa (Pinna nobilis). Slovenia justifies selecting these habitats by stating that the Cymodocea and seagrass are included in the Annexes to the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA/BD Protocol) of the Barcelona Convention and coral rock is a type of Mediterranean endemic species which forms large biogenic formation (e.g. facies, reefs), and is a good indicator of status development, in relation to climate change and direct human influences.

Threshold values have been defined for criteria 1.4 and 1.6 (but not for 1.5) in terms of various indices for soft bottom benthic invertebrates and seagrass meadows (presumable taken from other directives such as the WFD), and states as a baseline that anthropogenic interventions shall be minimal. A threshold value has been defined for density of cunner (fish), which should rather have been reported under species abundance (1.1). Baselines for criterion 1.6 are much more specific than for the other criteria. The baselines focus on various aspects of seabed habitats (seagrasses using leaf length as indicator, and various appropriate multi-metric indices for benthic invertebrates) but do not cover water column habitats.

While criteria 1.1 to 1.3 seem to use either the 2012 status or the status as defined by EU directives as baselines, criteria 1.4 to 1.6 refer to ‘natural conditions’, which is assumed to mean “free from anthropogenic influences”. Slovenia does not mention acceptable deviation and it is not clear where current conditions are in relation to the target state or to what extent current states are degraded or in need of restitution. It is assumed that this is assessed in the 2012 initial assessment.

Criterion 1.7 (ecosystem structure) is addressed only in general terms, and no thresholds or reference values are given, except for the mention of ‘natural conditions’.

**Conclusion on adequacy:** The definition of GES for Descriptor 1 is considered to be partially adequate. GES is defined for all criteria (although it is uncertain whether criterion 1.3 is fully covered) however the species covered by the GES definition are only listed/protected species. The coverage of habitats seems to be broader as Slovenia covers a number of littoral habitats and water column habitats. In addition, quantitative threshold values and baselines have been defined for the habitats criterion, in relation to the WFD. Reference to the relevant EU legislation and various regional and international agreements is made throughout the GES definition. The definition for criterion 1.7 means that the ecosystem is covered in a holistic manner, even though the definition is rather vague. In terms of baseline, if current status is not at GES, the use of the IA as a baseline is considered not to be appropriate. A current or past degraded state can be used as a baseline only if the ambition is to improve quality towards a reference state (reference conditions).
1.2 Descriptor 4

Definition of GES (paper report and reporting sheet):

D4. Structure and function of the ecosystem and feeding levels are maintained at a level that is prevalent in natural conditions.

4.2 Good condition, according to indicator 4.2.1, is achieved when the percentage of large fish (greater than the threshold LCUT) is greater than the threshold (threshold will be set in 2018, paper report)

4.3 Good condition with regard to the abundance / distribution of key trophic groups / species are maintained at a level that prevails in natural conditions.

The Slovenian GES definition for Descriptor 4 has been defined at descriptor and criteria level, although criterion 4.1 from the Commission Decision has not been defined. Due to the exclusion of criterion 4.1 the entire concept of productivity is lacking. Criterion 4.2 has been defined but the threshold LCUT will only be defined in 2018 and can therefore not be fully assessed.

Criterion 4.3 states that the abundance and distribution of key trophic groups needs to be maintained at levels that prevail under natural conditions, although the definition of natural conditions is not clear. In the threshold value column of the reporting sheets, Slovenia has reported the use of indicator 4.3.1 which at this stage describes the annual geometric mean of mesozooplankton biomass, although an actual threshold or baseline value for this indicator is not provided. In the paper report it is also mentioned that along with mesozooplankton, jellyfish will also be used as an indicator of changes in the food web. In the features column of the reporting sheet in regard to criterion 4.3, the only animal type mentioned are pelagic fish, while other species such as mammals and seabirds could also be relevant especially as indicators of changes in top predators.

Due to the lack of baselines and thresholds in the current GES definition it is currently not possible to judge the achievement of GES for Descriptor 4.

Conclusion on adequacy: The GES definition of Descriptor 4 for Slovenia is inadequate. The GES definition has not addressed criterion 4.1, thereby missing an important aspect of the descriptor. Furthermore the GES definition only addresses a small number of food web components and lacks measurable thresholds and baselines.

1.3 Descriptor 6

Definition of GES (paper report and reporting sheet):

6.1 Good condition is achieved when there is no recorded significant physical DNA damage or losses due to the construction in the areas of biogenic substrate. For areas with different substrates, the extent to which abrasion, other DNA damage and loss of natural areas occur is smaller than the threshold value of x% of the surface.

6.2 The seabed is in good condition when it is at the level that ensures the protection of the natural structure, scope, distribution and functions of the ecosystem, and where there are no long-term adverse effects on the benthic community.

Descriptor 6 has been defined at the criterion level for both criterion 6.1 and 6.2. However, the GES definition provided by Slovenia is quite unclear and therefore difficult to interpret.

Criterion 6.1 consists of two parts, one that deals with damage resulting from the construction in areas of biogenic substrate and the second with abrasion in areas with different substrates. Based on this it
can be interpreted that biogenic substrates are only protected from construction and not abrasion. The reference to DNA damage in the second part of the definition of criterion 6.1 might however suggest that biogenic substrates are covered under both parts. The threshold in regard to areas where abrasion and other DNA damage and the loss of natural areas occurs has not yet been defined; the paper report suggests that this will be set in 2018, which might be too late to ensure GES by 2020. It is also not clear what is meant by DNA damage.

In regard to both criteria 6.1 and 6.2, it is unclear what is considered “natural”. In both cases it should be specified whether this implies some acceptable deviation from pristine.

Criterion 6.2 states that GES is achieved when it is at a level where various seabed attributes are protected. This use of the word “protection” is however quite vague, since it can imply that these functions should continue to exist, but it could also potentially refer to protection measures rather than the state of the seabed. The second part of the definition of criterion 6.2 referring to the lack of long-term adverse effects implies that the former applies.

**Conclusion on adequacy:** The GES definition set for Descriptor 6 is considered inadequate. The Descriptor 6 definition is vague and lacks thresholds and measurable baselines. A number of terms would need to be clarified or specified for the definition to be more adequate (e.g. “DNA damage”, “natural”, “long-term”).

### II. Initial assessment

#### 2.1 Pressures (physical loss and physical damage)

Slovenia has carried out a relatively limited initial assessment in relation to physical loss and physical damage - the information is mainly qualitative. Slovenia acknowledges that there is insufficient information available on the extent of the areas affected and the types of changes undergone, reporting that adequate methodology is still under development. In the reporting sheets, the assessment is more focused on pressures, but in the paper report, impacts are also described.

Slovenia indicates that the ports, land claim defence and tourism are the main causes of physical loss. The main features affected are listed and the proportion of the features impacted is provided (5-25%). However, no trends or conclusive judgements on the level of physical loss and its impacts are reported.

In relation to physical damage, Slovenia lists fisheries, tourism and ports as the main causes of the pressure. The main features affected are listed and the proportion of the features impacted is provided (75-100%). However, no trends or conclusive judgements on the level of physical damage and its impacts are reported. The evaluation of hydrographical changes carried out under the Water Framework Directive is briefly mentioned.

**Conclusion on adequacy:** The initial assessment by Slovenia of physical loss and damage is considered partially adequate. The different types and causes of physical loss and damage are documented and reported, but the information is limited. The information is mainly qualitative (even though the proportion of areas/habitats impacted is given) and no trends or judgements have been provided. A more detailed reference to the Water Framework Directive was expected.

#### 2.2 Biological features

**Habitats**

Slovenia has carried out an initial assessment on both seabed and water column habitats. The assessment is mainly qualitative and covers both seabed and water column habitats. Slovenia has reported on the following habitats: shallow sublittoral rock and biogenic reef, shallow sublittoral...
mixed sediment, coastal waters, littoral rock and biogenic reef, littoral sediment and Posidonia oceanica meadows. For each of the habitats reported, the information in the reporting sheets covers the habitat distribution, extension and condition, the main causes of pressure, the status of the habitat in relation to the natural status and the proportion of habitat that is altered. Trends (stable in all cases except littoral rock and biogenic reef and littoral sediment) and judgements on the current status (not good for littoral rock and biogenic reef and littoral sediment, good for shallow sublittoral rock and biogenic reef, shallow sublittoral mixed sediment and Posidonia oceanica meadows, with no conclusive judgement given for coastal waters) are also provided as are the threshold values and baselines used for these assessments. The paper report cites a considerable amount of literature and focuses on the initial assessment of mediolittoral habitat, rock infralittoral habitat, circalittoral habitat and water column. It refers a few times to the Habitats Directive.

Species/functional groups
In the reporting sheets Slovenia has reported on the following species/functional groups: coastal fish, pelagic elasmobranchs, demersal elasmobranchs, demersal fish and demersal cephalopods. Slovenia indicates that birds are covered under the reporting obligations of the Birds Directive and that mammals and turtles are covered under the reporting obligations of the Habitats Directive (even though they are addressed in the paper report). Each of these groups is briefly described and their state in relation to natural conditions is reported. For some groups the main causes of pressure are also listed. Judgements on the current status in relation to GES are provided only for coastal fish (good) and trends in status for relatively few groups: coastal fish (stable), pelagic and demersal elasmobranchs (declining). In addition, the following individual species are mentioned: Cladocora caespitosa, Engraulis encrasicolus, Sardina pilchardus and Solea solea. Trends (declining) and judgements (fully exploited or subjected to overfishing) on the current status are provided where the information is available.

Ecosystem
Slovenia has not reported on ecosystems.

Conclusion on adequacy: The initial assessment by Slovenia of biological features is considered partially adequate. The information is mainly qualitative but covers, although not always in great detail, most habitat types and functional/species groups, as well as a few individual species (groups which have not been reported on will be under the Habitats and Birds Directives). Trends and judgements on status are provided in some cases. Slovenia has not reported on ecosystems.

III. Environmental targets

3.1 Descriptor 1

Environmental targets (reporting sheets and paper report):

Target 1.1: Environmental objectives in relation to the distribution and status of species are in line with the objectives of the Birds Directive (92/43/EC)
Associated indicator: Preserving habitat for maintenance of stable population of common tern
Associated indicator: Preserving habitat for maintenance of stable population of little tern

Target 1.2: Environmental targets for the distribution, size and condition in accordance with the objectives of the Barcelona Convention
Associated indicator: Achievement of good status and prevention of deterioration due to human activities regarding the distribution and cover of coral rock, with regard to biomass of coral rock and in relation to demographic characteristics.
Associated indicator: Achievement of good status and prevention of deterioration due to human activity regarding the spatial and depth distribution of meadows of Cymodocea
Associated indicator: Achievement of good status and prevention of deterioration due to human activity regarding the spatial and depth distribution of meadows of Posidonia oceanica.
### Target 1.3: Environmental targets for the distribution, size and condition in accordance with the Habitats Directive (2009/147/EC)

Associated indicator: Achievement of favourable status and prevention of deterioration due to human activity regarding the distribution, number and demographic characteristics of bottlenose dolphins.

Associated indicator: Achievement of favourable status and prevention of deterioration due to human activity regarding the distribution, number and demographic characteristics of loggerhead sea turtle.

Associated indicator: Achievement of favourable status and prevention of deterioration due to human activity regarding the extent of cover, biomass and demographic characteristics of *Pinna nobilis*.

### Target 1.4: Environmental objectives for the description of the habitat regarding the distribution, size and condition are in accordance with Directive 2000/60/EC and the Habitats Directive (2009/147/EC).

Achievement of good status and prevention of deterioration due to human activities regarding the distribution, extent and condition of habitats in mediolittoral, infralittoral and circalittoral.

Associated indicator: Meadows of *Posidonia oceanica*

Associated indicator: Meadows of *Cymodocea*

Associated indicator: Invertebrates of soft seabed

Associated indicator: Habitat types

Associated indicator: Macroalgae of rock seabed

Associated indicator: Cunner density

### Target 1.5: The establishment of protected areas in Slovenian waters and the Adriatic by 2020.

### Target 1.6: All relevant criteria, indicators and targets should be considered in the EIA.

### Target 1.7: Eliminate the uncertainties and gaps in determining the initial status, assess the status and set objectives and targets for each of the criteria and indicators.

Slovenia has defined seven targets and associated indicators to cover Descriptor 1. A number of targets can also be considered relevant for Descriptor 6. The targets should be achieved by 2020.

Descriptor 1 targets are linked to achieving the objectives of a number of existing pieces of legislation including the Birds Directive, the Habitats Directive and the Water Framework Directive. Furthermore Slovenia has set as a target to achieve the objectives of the Barcelona convention. These targets which relate to these existing directives are by implication measurable. The associated indicators for these targets specify further which specific species and habitats are considered for each of the targets. In addition, most are associated with a quantitative threshold value and a baseline.

In regard to species, two birds (common and little tern), one mammal (bottlenose dolphin), one species of turtle (loggerhead) and one species of fish (cunner) have been mentioned in the associated indicators. This choice of species-level targets however does not contain the whole range of biodiversity components, especially regarding fish and seabirds for Slovenian waters. These are all listed/protected species, already covered by other pieces of legislation, which is in line with the definition of GES.

For indicators associated to habitats, Slovenia mentions a number of benthic habitats which constitute relatively good coverage of the main seabed habitats but do not cover water column habitats.

Finally, Slovenia also has three operational targets relating to Descriptor 1, including the establishment of protected areas for 10% of the surface of the coast and marine territory and the elimination of uncertainties and gaps in the initial assessment and the setting of objectives and targets for all criteria and indicators. Each of these three operational targets are interim targets but as the achievement deadline is set for 2020, it is therefore unlikely that these are sufficient to achieve GES.

*Conclusion on adequacy:* The Slovenian targets for D1 are considered partially adequate. The targets, along with associated indicators, are SMART. The targets focus on compliance with relevant existing legislation and convention, which means that the species and habitats covered by the targets are...
listed/protected species already covered by other frameworks. The coverage of the biodiversity components is therefore not comprehensive as not all relevant species are covered and water column habitats have been excluded completely, whereas the coverage of benthic habitats is relatively good. It is unlikely that the targets will be sufficient to achieve GES, which is defined at a more general level, especially for habitats.

### 3.2 Descriptor 4

**Environmental targets (reporting sheet and paper report):**

Target 4.1: Achievement of good status and prevention of deterioration of the indicator 4.3.1. Associated indicator: Geometric mean biomass of mezozooplankton below the threshold.

Target 4.2: To obtain data to assess the relevance of indicators to describe criteria 4.1 and 4.2, in co-operation with neighbouring countries.

Target 4.3: To obtain data for the upgrade assessment under criterion 4.3 in co-operation with neighbouring countries.

Target 4.4: Relevant missing metrics should be tested and coordinated at the sub-regional level.

Slovenia has defined four targets to cover Descriptor 4. The three main targets are related to obtaining more data in coordination with the neighbouring countries.

Only one of the targets is a state target which aims to achieve good status for, and prevent the deterioration of, indicator 4.3.1. The way the target is phrased implies that the current state is the baseline; yet in the paper report it is stated that the reference conditions are based on analysis of zooplankton biomass in the decade from 1971 and 1981 which is a period prior to strong eutrophication of the northern Adriatic. The target is rather an expression of GES than a target designed to help achieve GES.

**Conclusion on adequacy:** The Slovenian targets for D4 are considered inadequate. Slovenia has defined only one state target, which requires achieving GES but does not really clarify how it will do so. The remaining targets are data and knowledge collection targets. The set of targets cover only one food web component and are therefore not comprehensive or sufficient to achieve GES.

### 3.3 Descriptor 6

**Environmental targets (reporting sheet and paper report):**

Target 6.1: Achievement of good status and prevention of deterioration of the status regarding biomass, abundance and range of the biogenic substrate.

Target 6.2: Achievement of good status and prevention of deterioration of status regarding the amount of the seabed (different types of substrates), which is highly influenced by human activities.

Target 6.3: Achieving good status and preventing the deterioration of the status of benthic communities, which have been evaluated by using already developed and operational multi-metric indices for assessing the status and function of benthic communities, such as species diversity and richness, proportion of opportunistic and sensitive species.

Target 6.4: Achievement of environmental targets 6.1 and 6.2 in relation to D1 and D3.

Target 6.5: Identify the distribution, cover and biomass of biogenic substrates, with the aim to describe the status and determine good environmental status.
Target 6.6: Identify the prevalence and extent of seabed (for different types of substrates), which is highly influenced by human activities

Target 6.7: To reduce impacts due to physical damage of biogenic substrate - making recommendations and implementing best practices to reduce impacts.

Target 6.8: To reduce impacts on the seabed due to fishing practices, so that 10% of the seabed for different types of substrates is protected against mechanical damage.

Slovenia has defined eight targets for D6. Four targets are state-targets requiring the achievement of good status. They also require the prevention of the deterioration of the status but without specifying how that might be done. The targets are more like expressions of GES than tools used to help achieve GES. Two targets are research/data collection targets. The remaining two targets relate to the reduction of impacts/pressures.

None of the targets include a reference to existing legislation and none are sufficiently specific to be SMART except possibly for the last target to reduce the impacts of fishing practices so that 10% of the seabed is protected from mechanical damage. This last target is also the only target that is specifically aiming at reducing the level of impacts from a specific pressure.

Conclusion on adequacy: The Slovenian targets are judged as inadequate. The targets for Descriptor 6 lack references to relevant existing legislation and conventions and with the exception of one target are all insufficiently specific to be SMART. Half of the targets are expressions of GES rather than targets. Only one target focuses on pressure reduction. The targets as a set for Descriptor 6 are currently not specific enough to ensure the achievement of GES by 2020.

IV. Consistency

The approach for the three biodiversity descriptors is not fully consistent. With regard to Descriptor 1 for both the GES definition and the setting of targets, Slovenia has referred to existing legislation which it has not done for Descriptors 4 and 6. The GES definitions for each of the descriptors have been defined at a high level and generally remain at the criteria level. The GES definitions often set as a baseline “natural conditions” but it is unclear what are considered natural conditions. In addition, it seems that the GES definition for D1 includes only protected/listed habitats and does not address all marine species reported in the initial assessment.

The targets are not comprehensive enough to achieve GES and are not fully consistent with the initial assessment. Slovenia’s option not to report on some species groups/individual species, justified by the fact that they will be covered under the reporting obligations of the Habitats and Birds Directives, did not hinder the establishment of targets covering some of these species groups/individual species (e.g. loggerhead turtle). Still, the choice of species-level targets does not contain the whole range of biodiversity components, especially regarding fish and seabirds, for Slovenian waters.
Section 4. Descriptor 2 (Non-indigenous species)

I. Good Environmental Status (GES)

GES definition (paper report and reporting sheet):

2.1 Non-indigenous species may be present and settled in number and magnitude that does not have negative impacts on native species and habitats

2.2 The impact of non-native species on ecosystem is negligible.

GES is defined only at criteria level. However, the definition is closer to the D2 definition at descriptor level as set by the MSFD Annex I. The main difference is that it does not refer to introduction by human activities. The terms ‘number and magnitude’ relates to ‘abundance’ as set in criteria 2.1. Impacts at the levels of species, habitats and ecosystems covered by indicator 2.2.2 are mentioned. However, it is not specified what is meant by ‘negligible impact’. With regard to criterion 2.2, the paper report indicates that indicator 2.2.1 is not practical, since it demands monitoring that is too extensive and intensive in relation to the expected results. It adds that no such impact has been detected in Slovenian waters.

On the whole, the Slovenian definition reflects criteria 2.1 and 2.2 at a high level. It does not provide any information on specific vectors or NIS. There is no indication of baseline, although it could be inferred that the baseline is the current status.

In the accompanying text in the paper report, Slovenia notes that the introduction of certain species due to human activities is already regulated at EU level in order to assess and minimize their potential impact on aquatic ecosystems, and that the use of certain non-native species in aquaculture has to be authorised in accordance with applicable regulations. It notes that further research is needed for developing indicators, in particular on the impact of invasive NIS. It adds that priority should be given to the definition of the current situation, which is a prerequisite for assessing the extent of impact, but by itself does not provide for the achievement of good environmental status for this descriptor. There are no plans as to how such research should be carried out.

**Conclusion on adequacy:** The GES definition for D2 is assessed as *inadequate*. The minimum requirements (no further increase of NIS which have an adverse effect on the ecosystem, i.e. no new introductions of NIS, and where possible no further spreading of them) are not clearly reflected. The descriptor is set at criteria level but in a broad and imprecise way. The baseline is not clearly set.

II. Initial Assessment

Slovenia has provided a list of 16 NIS indicating for all of them the predominant habitat or functional group to which the species belongs or is associated and their means of arrival. It indicates that this number is considered as understated due to the lack of projects and research, in particular the lack of regular monitoring for established non-native organisms, which would allow for the interpretation of basic information on population growth and trends of colonisation. NIS that are established and common in Slovenian waters are listed.

Based on the available data and expert knowledge, it is concluded that non-native species in Slovenian waters do not currently have significant negative impacts on native species and ecosystems. Slovenia notes that there is no information on the potential impacts that these organisms (may) have on biodiversity in Slovenian waters, adding that the available data contain the records of the occurrence
of non-native species without detailed data on the ecological and/or biological parameters of these species and that there is no concrete data on the relationship between invasive and native species.

The main pathways/vectors identified are ballast water and aquaculture.

Slovenia is making a judgement on the level of the pressure which is considered as ‘good’, based on available data, and on the trend assessed as ‘stable’, both with a medium level of confidence. This is in relation to criterion 2.1.

**Conclusion on adequacy:** The initial assessment is considered as *partially adequate*. It appears relatively complete in light of what can be expected for Descriptor 2. Slovenia has provided a list of invasive NIS and information on the level of pressure, as well as a judgement of the status in relation to GES (only for criterion 2.1). There is no assessment of impacts. Slovenia notes knowledge and data gaps but one of the targets aims at establishing on-going monitoring of the most vulnerable areas.

### III. Environmental targets

#### Environmental targets (reporting sheet):

Target 2.1: A system for the control of vectors and pathways of introduction of non-native species and a system for fast action are established, so the risk of entry is minimal.

Target 2.2: On-going monitoring of areas most vulnerable for the introduction of non-native species is established (e.g. area of Koper Port).

Target 2.3: Establishment of control over the already established invasive species in the sub-region which have a high invasive potential; taking of measures when their impact on the environment is detected.

Slovenia has set three interim environmental targets for Descriptor 2. There are no associated indicators. All targets are time-bound with a deadline set at January 2020.

The first target is an impact target for which limit/threshold should be set later. It is not specific (no indication of specific vectors and pathways, no indication of what are considered as fast actions). The target is too vague to be measurable. It is achievable and quite realistic.

Slovenia notes that the assessment method should be developed by 2018 in cooperation with other Adriatic countries. It should be noted that this is the only target reported in the paper report on Article 10 for Descriptor 2 when three targets have been reported upon for Descriptor 2 in the reporting sheet and the summary paper report covering Articles 9 and 10.

The second target relates to monitoring of most vulnerable areas for the introduction of NIS. One example of such area is provided – the Koper Port. Apart from this example, the most vulnerable areas are not identified. In the absence of specifications, the target is not measurable. It is achievable and realistic.

Similarly, the third target is rather vague as it does not specify the type of control to be established and which are the invasive NIS with a high invasive potential. Taking control measures to address further spreading of already established species is difficult to measure without further specifications. For the same reason, in order to be achievable, clear indicators should be defined. While reducing further spreading of already established species should be an overall goal, this is not always feasible and would apply only when possible.

**Conclusion on adequacy:** The environmental targets are considered as *partially adequate*. They are not fully SMART, as in particular they lack specification. There are no associated indicators. The
targets are consistent as a set. While the first target aims at controlling the risk of introduction, the third one addresses the invasive NIS already established. The second target is a surveillance target aiming at monitoring risk areas and all taken together are ambitious enough.

IV. Consistency

While the assessment has identified particular species and vectors/pathways, the definition of GES remains very general. The targets also lack specification and could have been more appropriately reported against Article 9, as they mainly reflect the minimum requirements (no new introduction of NIS and where possible no further spreading of them).

Slovenia recognises that the lack of specifications is linked to knowledge and data gaps and proposes to address these gaps in order to set more detailed targets by 2018. However, while this introduces a certain degree of consistency, the level of details provided in the initial assessment should enable more detailed definition of GES and environmental targets at present.
Section 5. Descriptor 3 (Commercial fish and shellfish)

I. Good Environmental Status (GES)

**Definition of GES (reporting sheet and paper report):**

3.1.1. Good status regarding the Indicator 3.1.1 is achieved when the catch of all types of commercial species is sustainable (defined as a fishing mortality) and is less than the target value consistent with the sustainable use of the resource (Fmsy) or the exploitation rate (E = F / W for small pelagic fish), wherein the exploitation rate is (E = 0.4), as proposed by Patterson (1992).

3.1.2. Good status regarding the Indicator 3.1.2 is achieved when the ratio of catch and biomass index for all commercial species is stable or in decline for the data obtained from sampling with trawling nets.

3.2.1. Good status regarding the Indicator 3.2.1 is achieved when the spawning stock biomass (SSBMSY) is above the threshold.

3.2.2. Good status according to the Indicator 3.2.2 is achieved when the biomass index for adult specimens for all commercial species is stable or in decline for the data obtained from sampling with trawl nets.

3.3.1. Good status regarding the Indicator 3.3.1 is achieved when for all commercial species the x% ratio of the fish that are larger than the average when reaching sexual maturity is stable or rising, according to data obtained from sampling with trawl nets.

3.3.3. Good status regarding the Indicator 3.3.3 is achieved when for all commercial species the 95 percentile of the fish length distribution, observed in research vessel surveys, is stable or rising, according to data obtained from sampling with trawl nets.

Slovenia has defined Descriptor 3 at the indicator level and has covered all indicators of the Commission Decision with the exception of indicators 3.3.2 and 3.3.4. In relation to indicator 3.3.4 Slovenia has justified the exclusion of this indicator due to a lack of data on the sizes at first sexual maturity (L50).

Both the primary and secondary indicators have been applied for criterion 3.1. In order to achieve GES all stocks need to be exploited below Fmsy, at the exploitation rate of E=0.4 for small pelagic species which is a suitable proxy for Fmsy or if these values are not available then the catch biomass ratio needs to be stable or decrease. Criterion 3.1 has been defined in accordance with guidance from the Commission Decision.

With regard to criterion 3.2 both the primary and secondary indicators have been applied. Indicator 3.2.1 is achieved when the SSB is above the SSBmsy threshold. However, unlike indicator 3.1.1, it does not explicitly state that this applies for all commercial species. The secondary indicator 3.2.2 is achieved when the biomass index for adult specimens for all commercial species is stable or decreasing for data obtained from sampling with trawl nets. This indicator has however not been applied correctly since decreasing biomass indices indicates overexploitation. Additionally, sampling by trawl nets will not be adequate to sample all stocks since not all commercial species are caught using trawling techniques. Furthermore based on the phrasing for these two indicators, it can be understood that Slovenia does not require all stocks to be at a level equal to or above SSBmsy and does not necessarily require all stocks to be at or above SSBpa and is therefore not in line with guidance from the Commission.

Indicator 3.3.1 has been applied but a definitive threshold has not been set, however this is not a problem as there is still no clear guidance from the Commission on how to apply this indicator. Indicator 3.3.3 has been applied and in order for GES to be achieved, the indicator should remain stable or rising for all commercial fish species. This could be considered a good practice.
**Conclusion on adequacy:** The Slovenian GES is partially adequate. For criterion 3.1 the Slovenian GES requires all stocks with an Fmsy reference point to be exploited below Fmsy or E=0.4 which is an appropriate MSY proxy. This is in line with the Commission Decision. The secondary indicator 3.1.2 has been applied correctly. The Slovenian definition in regard to criterion 3.2 has not been defined in accordance with guidance from the Commission since it is not clear that all commercially exploited species should at least be at or above SSBmsy or SSBpa. The secondary indicator has been applied incorrectly since decreasing biomass indices are an indication of overexploitation. Criterion 3.3 has been applied, which is in accordance with guidance from the Commission and indicator 3.3.3 has to remain stable or increase in order to achieve GES and therefore has a threshold which can be considered a good practice.

**II. Initial Assessment**

In the main text on fisheries, Slovenia has for their initial assessment assessed 12 fish stocks, one elasmobranch and three cephalopods for relative frequency in occurrence %, abundance trends in number of individuals per km² and biomass trends of these species in kg/km². Furthermore in the annexes, Slovenia has provided data for the same parameters as mentioned previously for species sampled independently from fisheries for a significantly larger number of species which presumably are not all species that are commercially exploited. Slovenia however has not assessed the commercial species in relation to F or SSB reference points. No assessment of the current status in relation to GES has been made for commercial fish stocks.

The level and trends of fishing effort and thereby fishing pressure have been described in detail by providing the fishing days, number of vessels and engine power for the various fleets. Additionally, Slovenia has reported the landings of various types of marine organisms such as pelagic and demersal fish, shellfish, crustaceans etc. Lastly, Slovenia has assessed the types of by-catch and discards of Slovenian vessels as monitored for five types of discards. Impacts on the seafloor or functional groups are not assessed.

**Conclusion on adequacy:** The Slovenian initial assessment is partially adequate. The initial assessment provides relevant information for a large number of species and a good overview of the trends and states of Slovenian fisheries. The assessment however has not assessed stocks in relation to MSY or Pa reference points. Impacts on the seafloor and functional groups are not assessed.

**III. Environmental targets**

**Environmental targets (paper report and reporting sheet):**

**Target 3.1:** By 2018 it will be necessary to reduce the fishing mortality to a level which will ensure sustainable use. Related objectives: the stock of sole (Solea solea) is in overfishing; as a result, reduction of F is recommended, especially with the use of dredges. Two-month ban on fishing with dredges in the belt of 11 km from the Italian coast; after closures reduce the catch of juveniles. Stock of sardine (Sardina pilchardus) is fully utilized; as a result, the fishing effort should not increase. Interaction with the fishery for anchovy should also be considered. The stock of anchovy (Engraulis encrasicolus) is fully utilized, thus the fishing effort should not increase. Interaction with the fishery for pilchard should also be considered.

**Target 3.2:** It is necessary to prepare the assessment of the impact of recreational fisheries and, if necessary, appropriate supervision.

**Target 3.3:** By 2018, a reduction of fishing effort for x% is needed for all species, for which it is found (based on research) that they have a reduced ability to reproduce or the composition of the population according to age and size is changed.
Target 3.4: Development of relevant indicators to describe the commercial fish and shellfish species by xx?.

Slovenia has defined four interim targets for Descriptor 3, two of which are pressure reduction targets while two are operational targets. The targets are generally rather vague and in some cases have components that are not fully defined and clearly require further development.

In regard to the first target it is specified that fishing mortality needs to be reduced in order to achieve sustainable use, however the definition of sustainable is not provided (e.g. PA, MSY) and it is unclear how this target applies to all commercial species. The first target does however include specific recommendations related to the fishing mortality (F) for sole, sardines and anchovy and states that regarding interactions of the fishery, pilchard should be specifically considered. These specific recommendations do not cover the majority of stocks; it can however be assumed that as the third target is specified further, more specific stock recommendations regarding fishing mortality will be provided.

The second target deals specifically with recreational fisheries. It specifies that it is necessary to prepare an assessment of the impact of recreational fisheries but does not explicitly state that an assessment will take place. This target is therefore rather noncommittal. The final target to develop relevant indicators for Descriptor 3 is useful, although it remains vague and without a defined deadline.

Conclusion on adequacy: The Slovenian targets for D3 are considered inadequate. The targets remain quite vague and do not specify whether any or all commercial species will be exploited at Fmsy. The target as it is stated aims for commercial species to be exploited sustainably which could imply either at MSY or Pa levels, although based on the GES definition it could be deduced to be at MSY. Furthermore, the targets still include components that require completion. The positive aspects of the targets are that they explicitly state the necessity for reduction in fishing effort when stocks are overexploited and that a target on recreational fisheries has been included.

IV. Consistency

The Slovenian approach to Descriptor 3 has not consistently used MSY and PA reference points. GES is defined using MSY reference points while they have not been used in the initial assessment or explicitly when defining the targets.

In regard to both the GES and targets, it is clear that certain components still require completion as has been indicated by filling in an “x” where a number should be specified. This means that it is not possible to assess whether the setting of targets is consistent with the definition of GES.
Section 6. Descriptor 5 (Eutrophication)

I. Good Environmental Status (GES)

Definition of GES (reporting sheet and paper report):

D5. Eutrophication due to human activity, and the adverse effects thereof, such as losses in biodiversity, ecosystem degradation, harmful algae blooms and oxygen deficiency in bottom waters is minimal.

5.1. Sea status is good if the annual average concentrations of nutrients in the sea do not exceed the environmental quality standards for coastal waters in accordance with the regulations governing the status of surface waters.

5.2. The status in open waters is good when eutrophication due to human activity is not causing harmful bloom.

5.3. In the open waters the GES is determined by the spatial and temporal distribution of concentrations of dissolved oxygen in the bottom layer. Good environmental status represents the situation in which the episodes of lack of oxygen (hypoxia) in the bottom layer in time and space are so limited that they do not cause lasting damage to habitats on the seabed.

Slovenia has defined GES for Descriptor 5 at descriptor and criteria levels in the reporting sheets, but only at descriptor level in the paper report. All criteria and most indicators laid out for Descriptor 5 in the 2010 Commission Decision are incorporated.

For criterion 5.1, nutrient concentrations, but not ratios are included. For criterion 5.2, chlorophyll is included, with reference to long-term water transparency, but while the description of this criterion refers to harmful algal blooms, the criterion does not include a measure of this, nor of changes in floristic composition. Growth of opportunistic macroalgae is not considered, unless this is monitored as a constituent of the infralittoral macrophytobenthos, using the results of a macroalgal index (applicable where Cystoseira spp. predominates). Just beyond this, in slightly deeper waters where sediment, rather than stone-based substrates exist, a seagrass-based index is used to determine environmental status. For criterion 5.3, dissolved oxygen status is used to define GES in the deepest waters, in conjunction with other water column-based criteria. Quantitative thresholds/reference levels are provided for all relevant criteria discussed above, except for the seagrass index and dissolved oxygen concentrations. However, with regard to the latter, the prevention of hypoxic conditions is referred to, so it seems appropriate that a threshold value of 2 mg/l oxygen is applied.

A national approach is used to define MSFD GES, explaining in detail how the Water Framework Directive normative definitions are incorporated into the assessment. All criteria are employed, together with most (if not all) relevant indicators (5.1.1, 5.2.1, 5.2.2, 5.3.1, 5.3.2). However, indicators covering growth of opportunistic macroalgae and species shifts in floristic composition do not appear to have been included; the former suggesting that intertidal areas may not be fully monitored/assessed with regard to Descriptor 5.

Conclusion on adequacy: The GES definition of Slovenia for Descriptor 5 is assessed as partially adequate. All criteria of the 2010 Commission Decision are employed, together with most relevant...
II. Initial Assessment

Slovenia has carried out an initial assessment – qualitative and quantitative – on the level of pressure and impacts of eutrophication in their marine waters. The assessment covers all relevant nutrients (nitrogen and phosphorus) in terms of loads and concentrations, and even includes an assessment of organic loading. The breakdown of total loads into individual source-derived loads is limited, particularly with regard to diffuse source-derived terrestrial loads (agriculture, forestry, urban runoff) and atmospheric deposition. However, considerable effort has been made to describe nutrient loads from urban wastewater treatment plants. Groundwater inputs are not considered and no assessment has been made of transboundary inputs from adjacent marine areas. The assessment fails to adequately cover impacts on macrophytobenthos (bearing in mind the Water Framework Directive coastal water monitoring), but does consider dissolved oxygen status (the impact of which would be most apparent on the zoobenthos community, the status of which is not used as a Descriptor 5 indicator).

Organic enrichment is considered primarily in terms of particulate (not dissolved) matter and mucus aggregates (presumably phytoplankton-derived and colloidal). Impacts on nutrient levels within the water column are discussed, as is transparency in the light of long-term chlorophyll data. Trends and judgements are provided, as are in some cases, the thresholds used for these judgements. Overall, trophic status is considered to be either improving or stable, with fluctuating nutrient levels recorded over the past three decades (approx.). In general terms, the situation worsened during the 1990s but appears to have improved during the 2000s, albeit with elevated nitrogen levels once again recorded recently. The input load of organic matter is considered stable, as is the status of pelagic habitats, while seabed features are considered to be improving. The proportion of features impacted has not been assessed. There is no explicit reference to the reports or monitoring under the Water Framework Directive.

Conclusion on adequacy: The initial assessment of Slovenia for eutrophication is assessed as adequate. The assessment includes qualitative and quantitative information on all the relevant nutrients and organic matter in terms of loads and concentrations. The main causes of pressure are identified although the information is not comprehensive. Most impacts are addressed but not on macrophytobenthos. Trends and judgements are provided.

III. Environmental targets

Environmental targets (reporting sheet and paper report)

5.1. Environmental targets for eutrophication are in accordance with Directive 2000/60/EC.
Associated indicator: To achieve good and avoid deterioration of the status of the level of nutrients in the water column. Average annual concentrations of nutrients in the water column do not exceed the environmental quality standards for coastal waters in accordance with the regulations governing the status of surface waters.
Associated indicator: Achieve good status and avoid the deterioration of the status of the water column where there is no excessive phytoplankton bloom, which is reflected in high concentrations of chlorophyll a.
Associated indicator: Achieve good status and avoid the deterioration of the status of stone seabed of infralittoral regarding macroalgae. This Indicator is the same as that for macroalgae presented for Target 1.4.

5.2. Achieve good status and avoid the deterioration of the status on sedimentary seabed of infralittoral depending on the status of marine flowering meadows.
Associated indicator: The indicator level for meadows of *Cymodocea nodosa* MMSkew. This indicator is the...
5.3. Achieve good status and avoid deterioration of status regarding the oxygen concentration at the bottom, which should be suitable for the survival of demersal fauna. Episodes of lack of oxygen (hypoxia) in the bottom layer should be temporally and spatially limited so as not to cause death of demersal organisms and permanent damage to the seabed.

Associated indicator: Concentration of oxygen at the seabed, or the volume of anoxic hypoxia and the duration of the phenomenon.

Associated indicator: Since a spatial and temporal dimension to the occurrence of hypoxia and anoxia is important, the operational objective is to obtain information from O$_2$-deprived areas. In addition, these data must be measured in the shortest possible time intervals. Continued surveillance of risk areas shall be achieved by setting the oxygen sensors which measure the concentration in real time.

Slovenia has defined three environmental targets and several associated indicators to address Descriptor 5. The targets and indicators are basically the same in the reporting sheets and in the paper report, although the wording used is not exactly the same.

All targets are generally impact-related, but relatively unspecific if viewed in isolation. However, when viewed in the light of the indicators, they are highly specific. They are all measurable and appear to be achievable/realistic, but no timeframe is provided apart from the overall timeframe of achieving GES by 2020. Indicator 5.3.ii is unusual, since this is relates specifically to monitoring, not addressing impacts or pressures. Even though no threshold appears to have been set, the achievement of Indicator 5.3.ii will allow achievement of Indicator 5.3.i to be assessed and progress in meeting Target 3 to be determined.

The set of targets is considered as sufficiently aiming towards reducing levels of a specified pressure or impact, or controlling human activities, which are preventing GES from being achieved. Target 1 acts as a useful cross-link between the Water Framework Directive GES and MSFD GES, focusing on the achievement of both with regard to nutrient and phytoplankton (chlorophyll) levels, as well as macroalgal community status. Target 2 focuses on the achievement of GES for seagrass meadows, while Target 3 focuses on improving measurement/knowledge and status of the submarine oxygen climate. The targets do not tackle pressures directly but rely on the premise that improvements in environmental status will occur primarily through pressure reduction. On the whole, the targets cover all criteria of the Commission Decision.

The targets and associated indicators defined for Descriptor 5 are consistent as a set. The only conflict that arises is because there is more than one indicator for each target, each one with different thresholds - thus, the achievement of each target would rely on all thresholds for that target being met.

Conclusion on adequacy: The set of environmental targets and associated indicators defined by Slovenia for Descriptor 5 is assessed as adequate. The targets are specific, measurable and appear to be achievable and realistic; the only timeframe provided is 2020, to achieve GES. The targets are all impact related, relying on the premise that improvements in environmental status will occur primarily through pressure reduction. They are ambitious and consistent.

IV. Consistency

All criteria are employed in the definition of GES, together with most (if not all) relevant indicators (5.1.1, 5.2.1, 5.2.2, 5.3.1, 5.3.2). The Water Framework Directive coastal waters phytobenthos monitoring results do not appear to have been included in the impact assessment, and there is also a paucity of data for some water column criteria. However, available data generally appear to have been used for the analysis. The pressures assessment lacks detail with regard to some individual pressures,
suggesting that improved monitoring/modelling is required to fill knowledge gaps, but available information appears to have been used.

The targets/indicators appear to cover nutrient levels, chlorophyll, water transparency and perennial seaweeds/seagrasses, although a clear statement of what the Water Framework Directive monitoring involves is required. The same criteria are considered in the initial assessment. Pressures are not considered in the targets, except via the achievement of GES, but the initial assessment appears to cover available data in the assessment of pressures.

The set of targets will probably lead to a reduction in the identified pressures/impacts. The targets effectively define GES, the full achievement of which will probably require some pressure reduction. A further breakdown of total pressures and quantification of individual sources of nutrients/organic matter would clarify matters as to appropriate next steps.
Section 7. Descriptor 7 (Hydrographical conditions)

I. Good Environmental Status (GES)

Definition of GES (reporting sheet and paper report):

D7. Changes in hydrographic conditions do not alter the environmental conditions (biodiversity loss, habitat degradation, harmful algae blooms and oxygen deficiency in the bottom layer), or the changes are minimal.

Slovenia has defined GES for Descriptor 7 at descriptor level both in the reporting sheets and in the paper report (the text is not exactly the same but it is very similar). Although the definition is in line with the 2010 Commission Decision, none of the criteria and indicators laid out for Descriptor 7 are incorporated and no justification has been provided.

In the reporting sheets, the features impacted are listed but no reference values or thresholds are provided. There is no reference to the appropriate WFD normative definitions of ecological status classifications for coastal waters.

Conclusion on adequacy: The GES definition of Slovenia for Descriptor 7 is assessed as inadequate. GES is determined at descriptor level, is not a repetition of the MSFD Annex I definition and is consistent with Commission Decision. However, no reference values or thresholds have been provided and ecosystems and impacts are described in a general way. There is also no reference to WFD definitions, although all Slovenian waters are concerned by WFD.

II. Initial Assessment

Slovenia has carried out an initial assessment on the level of pressure and impacts of hydrographical changes. The information is limited and mostly qualitative, but no plans are described to address the knowledge gaps. It is reported that 5-25% of the Slovenian marine water are affected by permanent hydrographical changes but the Bay of Koper is expressly mentioned as the area of most concern. Ports and land claim defence are listed as the main causes of pressure. The impacts on water column and seabed habitats are very briefly described. The reference to “heavily modified water bodies” in the Bay of Koper is the only direct link with the Water Framework Directive.

No trends or conclusive judgements are provided in relation to the level of pressure and impacts of permanent hydrographical changes. In relation to marine acidification, it is reported that less than 1% of the Slovenian waters are affected and measurements for the period 1989-2010 are provided. The main causes of marine acidification are urban discharges, industry, agriculture and forestry.

Conclusion on adequacy: The initial assessment of Slovenia for hydrographical changes is assessed as inadequate. Although pressures and impacts are briefly reported there is no specific description of affected ecosystems or of impacts or judgement about the situation regarding GES. Given that Slovenian coastline is short with waters entirely coastal, they are very sensitive to pressures covered by the Water Framework Directive (main impacted areas classified Heavily Modified Water Bodies), and a better assessment could have been produced based on the Water Framework Directive reports.

III. Environmental targets

Environmental targets (paper report and reporting sheet)

7.1 - The scope of the area with permanent changes may not be greater than x%, which will be determined by...
7.2 - Good environmental status is achieved when there is sufficient oxygen in the aquatic environment for the smooth growth and living of organisms (important are temporal and spatial scales); nutrients occurring do not exceed the amount that would lead to eutrophication; after the change of hydrographic conditions the circulation of water masses and streaming do not change the environmental conditions.

7.3 - Environmental targets are in accordance with targets for D1, D4 and D5.

Slovenia has defined three targets but no indicators to address Descriptor 7. The targets are the same in the reporting sheets and in the paper report, but in the paper report it is stated that the proportion of area affected by hydrographical changes mentioned in Target 7.1 will be determined by 2018.

The proposed environmental targets are not specific, not measurable (no reference scale) and it is not possible to assess if they are achievable or realistic. The targets are not operational. The only timescale provided is the general reference to 2020. Target 7.1 is not specific enough as some of the elements are not developed (“parameter”, “change”) while Target 7.2 includes some parameters that are not specific to Descriptor 7 (nutrients). No thresholds or baselines are given for any of the proposed targets. As none of the targets specifically aim to reduce any impact of human activities there is no link with the initial assessment. The targets proposed are not useful to guide progress towards achieving GES. There is also no link to the Water Framework Directive or to other regulatory tools (e.g. EIA, SEA).

**Conclusion on adequacy:** The set of environmental targets defined by Slovenia for Descriptor 7 is assessed as inadequate. The proposed environmental targets are not SMART or operational. They are not specific and do not focus on the reduction of specific pressures or impacts, and are unlikely to be useful in guiding progress towards GES.

IV. Consistency

The assessment of the pressure and its impacts is consistent with the Slovenian definition of GES for Descriptor 7 as, on one hand, the initial assessment is very general, and on the other hand, the definition of GES is not very specific.

None of the targets are specifically targeted at reducing any impact of human activities and therefore there is no link with the initial assessment. Since the targets are not measurable or operational (i.e. they cannot be clearly related to any operational measure concerning pressures or impacts), they cannot be considered sufficient enough to achieve GES.
Section 8. Descriptor 8 (Contaminants)

I. Good Environmental Status (GES)

<table>
<thead>
<tr>
<th>Definition of GES (paper report and reporting sheet):</th>
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<tbody>
<tr>
<td>D8. Good condition of the marine environment in relation to pollution is achieved when the concentrations of pollutants do not cause adverse effects on organisms, populations, communities and ecosystems.</td>
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</table>

In addition, in the reporting sheet:

8.1. For marine water, the environmental standards for freshwater may be used as set in ‘Decree on the status of surface waters’ (URL 14/2009). Environmental standards for sediments are not yet established. Certain limit values for marine water are set in the relevant directives and regulations. The criterion for sediments (until a new directive is adopted) can be that the synthetic pollutants do not exceed values that can cause irreversible effects on organisms, and/or that non-synthetic pollutants do not deviate significantly from the natural values of the environment. The criterion can also be a non-increasing trend in pollutant concentrations. For organisms, limit values as set in the relevant EU regulations may be used for determination of GES.

8.2. Status of this descriptor is based on the knowledge of BC (background concentrations) and the criteria for evaluation of the BAC (Background Assessment Criteria) and EAC (Environmental Assessment Criteria); a fall below these values means the deterioration of the environment. Basal activity of each biomarker is determined according to geographic region only for some of the biomarkers.

Slovenia has defined GES for Descriptor 8 at descriptor and criteria level in the reporting sheets but only at descriptor level in the paper report. The coverage of the two criteria is only partial since the definition for criterion 8.2 does not cover acute pollution events and does not include specific biological effects on ecosystem components.

For criterion 8.1 on concentration of contaminants, Slovenia mentions the three relevant matrices for measurement of concentrations. For concentrations in water, Slovenia refers to the EQS Directive standards, indirectly through the reference to the Decree on the status of surface waters (URL 14/2009), which transposes the WFD, and directly in the reporting sheet field “threshold value”. Hence the limit values used by Slovenia are the EQS for measurements in water. This means that all priority substances should be covered, although Slovenia does not specify this. For concentrations in biota, Slovenia does not refer to the three substances (Hg, HCB, HCBD) for which an EQS has been set in biota. It refers however to Regulation 1881/2006 on foodstuffs limit values, which only covers species for human consumption and has a different focus than the EQS Directive (human health rather than environmental protection). For sediments, Slovenia mentions that no limit values have been set at EU level yet and therefore it defines a number of possible conditions for the achievement of GES:

- Synthetic pollutants do not exceed values that can cause irreversible effects on organisms
- Non-synthetic pollutants do not deviate significantly from the natural values of the environment
- Non-increasing trend in pollutant concentrations

It is not clear whether all these three conditions must be fulfilled for GES to be achieved, or only one/some of them. The formulation used (“can be”) also makes it unclear whether these conditions are necessary or only optional. Finally, the conditions are phrased only in a qualitative way (“do not deviate significantly”), which is explained by the fact that no standards have been defined at EU level for measurement in sediment. There is also a lack of specificity regarding the baseline to be used to assess whether concentrations in sediments have not increased.

For criterion 8.2 on effects of contaminants, Slovenia uses the background concentrations and environmental assessment criteria defined by OSPAR (Slovenia does not specify that they are from
OSPAR but it is understood from the use of the acronyms BAC and EAC). It is not clear why Slovenia has not used these for the criterion 8.1 for concentrations in biota and sediment but it can be considered covered by their mention under criterion 8.2. The formulation used by Slovenia is unclear. Slovenia mentions knowledge of the BC, the BAC and the EAC and mentions that a “fall below these values means the deterioration of the environment”. However, this is the opposite of what the EAC represent since they are limit values, i.e. values above which concentrations have a negative effect on the environment (including organisms) and therefore which shouldn’t be exceeded. It is assumed that this is an error in the Slovenian text. Criterion 8.2 covers effects of contaminants only from a concentration standpoint, it does not refer to specific biological effects on marine organisms, as defined e.g. in a number of OSPAR EcoQOs. It does refer to “basal activity of biomarkers” but does not specify which biomarkers should be used, nor does it explain what the condition for the achievement of GES is with reference to the biomarkers. It does not cover acute pollution events at all.

In the accompanying text to the GES definition, Slovenia links Descriptor 8 with a number of other descriptors, in particular D1, D4 and D9, but also D2, D3 and D10.

**Conclusion on adequacy:** The GES definition for D8 by Slovenia is considered partially adequate. Coverage of criterion 8.1 on concentration of contaminants is adequate as Slovenia refers to compliance with the EQS Directive for measurements in water. For biota and sediment, it also refers to the EAC (under Criterion 8.2). Considering that MEDPOL has no criteria of their own, the application of the OSPAR criteria is a reasonable start. However, some assumptions need to be made if the monitored species in the Mediterranean are different from those for which the OSPAR criteria apply. Effects of contaminants seem to be assessed only by looking at contaminant concentrations and it is unclear whether specific biological effects are included. Acute pollution events are not addressed at all.

### II. Initial assessment

**Synthetic and non-synthetic substances**

Slovenia has carried out a very limited and mainly qualitative assessment on the level of pressure and impacts from synthetic and non-synthetic substances. Slovenia acknowledges a series of serious shortcomings that prevented a more comprehensive assessment. Data are only available for certain groups of pollutants and for some of these only a single measurement was carried out. The information on loads from the different sources is also very scarce. Slovenia states the need to develop an adequate monitoring programme and to work closely with the neighbouring countries in the evaluation of the cross-border effects.

In the reporting sheets and in the paper report, Slovenia has listed the different sources of contamination by synthetic and non-synthetic substances (e.g. shipping activities, industrial and wastewater treatment wastes, agriculture). It provides quantification of input loads but only from land based sources. Little information is reported on both sea-based and air-based sources.

In terms of substances measured, Slovenia refers to organotin compounds (benzo[a]pyrene and its derivatives), PCBs and dioxins. Slovenia only makes an assessment of contaminant concentrations in species for human consumption, including the blue mussel (*Mytilus galloprovincialis*), the sea bass (*Dicentrarchus labrax*), sole (*Solea solea*) and horse mackerel (*Trachurus trachurus*), with reference to EU Regulations 1881/2006 and 1259/2011. It does not provide an indication of the level of contaminants in marine waters, in relation to the EQS Directive. In terms of quantification, it only mentions that less than 1% of its assessment area is affected by contamination by hazardous substances. It is not certain how it reaches this conclusion.

Practically no information is provided on the impacts of synthetic substances apart from the indication that general stress has been recorded in *Mytilus galloprovincialis* along the Slovenian coast due to various pollutants. No trend is provided as only one measurement has ever been performed. No information on the proportion of the area/habitats affected is provided.
Slovenia makes a judgement on the current level of the pressure in the marine environment in general. It considers that the level of pressure is not acceptable (i.e. status is not good), but only because of the high concentration of TBT (regarding all the other pollutants the status is considered good). Since no indication is provided regarding TBT concentrations anywhere else in the initial assessment, it is not certain how Slovenia reaches this conclusion. In addition, it is not specified what threshold values and baselines have been used to come up with this conclusion and how it refers to the GES definition, largely based on compliance with the EQS Directive.

In relation to non-synthetic substances, Slovenia indicates that concentrations of metals do not normally exceed the maximum permitted value. It also reports that the concentrations in biota of PAH and metals, resulting from one single measurement, are below the limit values laid down in Regulation 1881/2006. Very little information is reported on the impact of non-synthetic substances on habitats or functional groups – the results from one single study on the occurrence of micronuclei (MN) are mentioned. No trends, judgement or the proportion of the area/habitats affected are provided.

Radionuclides
Slovenia has not reported on radionuclides. Contamination by radionuclides was considered not relevant but no further justification has been provided.

Acute pollution events
Slovenia reports very briefly on acute pollution events, referring to the only ecological disaster that has occurred in their waters in 1983 and to other, smaller, occurrences, which concerned mainly oil spill. Slovenia indicates in addition that in the past 6 years, only minor incidents of pollution have been recorded. Shipping, tourism and industry are listed as the main causes of acute pollution events. There is no reference to the impacts caused by these events. No quantification, trends or judgements are provided and no gaps or future plans are reported.

Conclusion on adequacy: The initial assessment of Slovenia for contaminants is considered inadequate. The assessment is very limited, referring only to a limited number of sources of contaminants and to a few substances. There is practically no quantifiable information on loads or concentrations of substances or the impacts of these in the environment. In addition, the judgements made all refer to Regulation 1881/2006, which is only relevant for human consumption purposes but is not adequate for environmental protection. Considering the justification provided by Slovenia, it is possible that measurements have not been carried out under the Water Framework Directive, which would explain the lack of values for concentrations of priority substances in water.

III. Environmental targets

Environmental target (reporting sheet and paper report):
Target 8.1: Achievement of good status and no deterioration of the state in relation to the concentrations of pollutants in water, sediment and biota.

Target 8.2: Values of measured biological impacts are stable or show a descending trend.

Target 8.3: Concentrations of radionuclides in the water due to activities are compliant with the Decree on dose limits, radioactive contamination and intervention levels (IN2) (OG. RS, no. 49/2004), which transposes the provisions of Council Directive 96/29/Euratom laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation (OJ L 159, 29.6.1996).

Target 8.4: Determination of reference conditions or natural background concentrations of pollutants and metals
in sediment.

Target 8.5: The introduction of general stress biomarkers and relevant biomarkers (e.g. TBT), which measure specific responses to a group of pollutants.

Target 8.6: To determine the sources of pollution by TBT and to determine the relevant measures.

Slovenia has set six targets and one associated indicator to cover Descriptor 8. In the paper report, Slovenia has divided the targets into environment targets (including the first three targets) and operational targets (the last three targets). It is not clear what makes the last three targets “operational”. It could be considered that these targets require action to be taken by the Slovenian authorities in order to determine/measure the various elements addressed by the targets (reference conditions for pollutants and heavy metals in sediment; stress biomarkers and other relevant biomarkers; sources of pollution by, and concentrations of, TBT) before they could be used to define GES.

With regard to the first three targets, they address concentrations of contaminants (including radionuclides) in water, biota and sediment, referring to the relevant European standards (WFD, EQSD and Euratom standards) for water measurements (and possibly for biota measurements for the three substances for which an EQS has been defined in biota, although this is not specified). For sediments, Slovenia acknowledges the lack of reference values by setting an operational target, which aims to define reference or background concentrations for synthetic and non-synthetic substances in sediment.

The second environmental target refers to biological impacts and requires the values of measured biological impacts to remain stable or decrease. It is not clear which biological impacts the target addresses. The baseline defined by Slovenia is based either on measurements at points less affected (not specified which ones these are exactly) or on the current status at a given time (not specified which this is either). It also mentions that in order to determine BAC, seasonal dynamics of a particular biomarker should be known.

In addition, two operational targets relate to concentrations of TBT and to biomarkers, requiring that more knowledge is gathered on this two aspects.

**Conclusion on adequacy:** The set of targets and associated indicators defined by Slovenia to cover D8 is considered *partially adequate*. In terms of concentration of contaminants, Slovenia has defined appropriate targets related to European standards (WFD, EQSD and Euratom) for measurements in water. It does not refer to the OSPAR EAC, which it includes in its definition of GES. It defines a number of “operational” targets, which are actually targets to gather more knowledge on a number of aspects on which data is insufficient (e.g. concentrations in sediments, biomarkers, etc.). For effects of contaminants (8.2), it is unclear which values are used and the baseline is vaguely defined.

### IV. Consistency

The assessment of contamination of Slovenian marine waters and organisms by hazardous substances is not consistent with the definition of GES. It only covers a limited number of substances and does not refer to the EQS to assess concentrations in its marine waters or to the EAC for effects on ecosystem components. The only standards used are those of Regulation 1881/2006, which are adequate for D9 but not for D8. Although very limited, the IA includes an assessment of contamination by acute pollution but this is not addressed in the GES definition.

The initial assessment covers mostly compliance with EU foodstuffs regulation while the GES and targets refer appropriately to the relevant environmental legislation (WFD/EQSD).
One target is defined on concentrations of radionuclides while this aspect is not included in the GES definition. In addition, the targets do not refer to the environmental assessment criteria (EAC), which are used in the GES definition of criterion 8.2. Slovenia has set however three targets to gather more knowledge on aspects that have clearly been identified as gaps in the initial assessment.
Section 9. Descriptor 9 (Contaminants in Fish and Seafood)

I. Good Environmental Status (GES)

Definition of GES (paper report and reporting sheet):

D9. Good status of the marine environment in the sub-region in relation to the contamination of seafood is achieved when the concentration of any pollutant in fish or shellfish for human consumption does not exceed levels that are safe for human consumption according to the prescribed limit (Commission Regulations (EC) no. 1881/2006 and no. 1259/2011 setting maximum levels for certain contaminants in foodstuffs). Compliance shall be shown in samples of fish, fish products and bivalve molluscs in relation to catches in the waters under national jurisdiction.

Slovenia has set GES for Descriptor 9 at descriptor level in both the reporting sheet and the paper report. Criterion 9.1 is only partly defined in that the Slovenian definition covers the level of concentrations but not the number of contaminants or frequency of regulatory levels being exceeded.

With regard to the levels of concentrations, Slovenia defines its GES with reference to EU Regulation 1881/2006 and its amendment 1259/2011. Slovenia does not provide the list of substances covered by the definition, nor the list of species that should be used for the measurements. It is therefore assumed that all substances included in Regulation 1881/2006 are covered by the Slovenian definition and that all fish, fish products and bivalve molluscs included in the Regulation and relevant for Slovenian marine waters are addressed. Slovenia specifies that its definition applies to samples of fish, fish products and bivalve molluscs that are caught in the waters under national jurisdiction.

In the accompanying text, Slovenia mentions the links between D9 and other descriptors, in particular Descriptors 8, 3 and 6. It also mentions the need to coordinate the definition of GES for Descriptor 9 with neighbouring countries, at the level of the subregion.

Conclusion on adequacy: The definition of GES for Descriptor 9 by Slovenia is considered partially adequate. Slovenia refers to compliance with the relevant pieces of legislation (Regulation 1881/2006 and amendments) and includes a specification that its definition concerns samples coming from its marine waters (origin), which is considered a good practice, but it does not include a condition regarding the frequency of regulatory levels being exceeded (indicator 9.1.2), which means that GES is only partially defined.

II. Initial Assessment

Slovenia has carried out a limited and mainly qualitative assessment on contaminants in fish and seafood. The assessment of contamination of fish and seafood by hazardous substances is made in combination with the general assessment of contamination by hazardous substances (see D8 section) therefore the assessment of sources of contamination is the same as for D8.

Slovenia reported on the contamination by synthetic substances, referring to the results of a single measurement for PAHs, PCB and dioxins levels in shellfish (Mytilus galloprovincialis) and the following species of fish: sea bass (Dicentrarchus labrax), sole (Solea solea) and horse mackerel (Trachurus trachurus). Slovenia reports that the concentrations in biota of benzo[a]pyrene and its derivatives, and the concentration of PAHs, PCBs and dioxins are lower than those in Regulation 1881/2006/EC and Regulation 1259/2011/EU but no values are provided. While this assessment uses the same standards as the GES definition, Slovenia has not provided a conclusive judgement on the level of contamination in relation to GES (i.e. status is good). Neither trends nor the proportion of the area/habitats affected are provided.
On the contamination by non-synthetic substances, Slovenia reports that the concentrations in biota of metals, resulting from one single measurement, are below the limit values laid down in Regulation 1881/2006, but no actual values are provided. Besides mussels, the following species of fish and crustaceans were used: anchovy (Engraulis encrasicolus), pilchard (Sardina pilchardus), mackerel (Scomber sp.), Mugil cephalus, sea bass (Dicentrarchus labrax) and praying mantis (Squilla mantis). No trends or the proportion of the area/habitats affected are provided.

Contamination by radionuclides was considered not relevant but no further justification has been provided.

**Microbial pathogens**
Slovenia has reported on microbial pathogens. It refers to the Bathing Waters Directive (2006/7/EC) and considers that the levels of microbial pathogens are moderate with stable trend. The level of microbial pathogens in shellfish waters is not reported. Slovenia has made a judgement on the level of the pressure in both bathing and shellfish waters. The trend is considered as stable. The main causes for pressure are wastewater and aquaculture.

Slovenia notes the lack of information on the presence of microbial pathogens in the areas of aquaculture and proposes a number of areas where efforts should focus (detection of changes in the species composition of bacterial communities, development of species-specific primers to detect the targeted microbial pathogens in natural marine water samples).

**Conclusion on adequacy:** The initial assessment of Slovenia for the contamination of fish and seafood by hazardous substances and microbial pathogens is considered partially adequate. The assessment of contamination by hazardous substances is limited, referring only to a limited number of substances and based only on one measurement. Slovenia reports that the values of the substances measured are below EU standards, but the values as such are not provided. The assessment for microbial pathogens is adequate in the light of the information available. Some information is missing but the knowledge gaps have been identified and albeit vague plans are provided to fill these gaps.

**III. Environmental targets**

**Environmental targets (reporting sheet and paper report):**

Target 9.1: Concentrations of contaminants in fish and shellfish for human consumption must not exceed the limits laid down in EU legislation or other standards relevant to human health.
Associated indicator: Concentrations of pollutants on marine organisms used for human consumption are the limit values of the concentrations of pollutants set in Commission Regulations (EC) no. 1881/2006 and no. 1259/2011 setting maximum levels for certain contaminants in foodstuffs.

Target 9.2: Inspection should inspect at least x% of the catch landed by fishing vessels regarding fish, shellfish or other animals intended for human consumption (as a percentage to be determined by the year 2014).
Associated indicator: x% of the inspected catches are landed from fishing vessels regarding fish, shellfish or other animals intended for human consumption.

Slovenia has defined two targets and two associated indicators to cover Descriptor 9. In the paper report, the second target is qualified as “operational”.

The first target (and indicator) relates to compliance with the relevant EU foodstuffs regulations. No further specification is provided (i.e. specific substances or species).

Slovenia has defined a second target, which requires that a certain share of the catch of fish, shellfish and other animals intended for human consumption are inspected (presumably to ensure compliance...
with Regulation 1881/2006). The wording of the associated indicator is different from that of the target but it is assumed that it actually addresses the same objective. Neither the target nor the indicator provides a value for the share of catch to be inspected. Slovenia specifies in the target itself that this value should be defined in 2014. This “operational” target is more related to collecting additional data in order to be able to make an assessment of progress towards achieving GES.

**Conclusion on adequacy:** The set of targets and indicators defined by Slovenia to cover Descriptor 9 is considered *partially adequate*. The first target is actually a rewording of the GES definition, requiring compliance with the relevant EU standards. The second target is more original as it relates to the means to assess achievement of GES, i.e. inspections of catches. It does not directly address the reduction of a pressure but acknowledges that it is necessary to have an appropriate share of catches inspected in order to achieve a meaningful GES. However, the actual value is not included in the target or the indicator at this stage, and will only be determined in 2014, making the target unusable thus far.

**IV. Consistency**

The assessment of contamination of fish and seafood for human consumption by hazardous substances is relatively consistent with the GES definition as it uses the same standards (EU Regulations 1881/2006 and 1259/2011). As the GES definition and the target on concentrations are very general, they cover the substances covered in the initial assessment however the initial assessment does not cover all the substances included in these pieces of legislation.

A target has been defined on the share of catches that should be inspected but this aspect has not been addressed in the initial assessment.
Section 10. Descriptor 10 (Marine Litter)

I. Good Environmental Status (GES)

Definition of GES (paper report):

D10. The amount of waste in the marine environment is reducing and presents no danger to marine life at the population level, either due to direct mortality or in the form of indirect effects such as reduced fertility or bioaccumulation in the food web. Waste in the marine environment does not compromise the welfare of the people and does not cause negative economic impacts for industry and coastal communities.

Slovenia has defined GES for Descriptor 10 at descriptor level both in the reporting sheets and in the paper report (the text is very similar but “reduced fertility” is not mentioned in the reporting sheets). None of the criteria or indicators laid out for Descriptor 10 in the 2010 Commission Decision are incorporated and no justification has been provided.

Slovenia acknowledges the need for more information on marine litter and indicates that it is not possible to claim with certainty that GES will be achieved by 2020, stating that a decreasing trend in the amount of waste will be a good indicator of the developments achieved. The baseline used for this assessment is provided in the reporting sheets and consists of the results of the analyses from 2007-2012. It is also indicated that Descriptor 10 is related to Descriptors 1, 4 and 6 and some impacts are listed, including the socio-economic impacts on industry and coastal communities, which are not referred to in the 2010 Commission Decision.

Conclusion on adequacy: The definition of GES for Descriptor 10 is considered partially adequate. The definition is qualitative, although some detail is provided in order to assess if and when GES is achieved (decreasing trend for the amount of litter if compared to the baseline). Reference is made to Descriptors 1, 4 and 6. Some of the impacts of marine litter are listed in a qualitative way.

II. Initial Assessment

Slovenia has carried out an initial assessment on the level of pressure and the impacts of marine litter in Slovenian marine waters. The assessment focuses on litter found on beaches and in the water column. It is acknowledged that there is insufficient data on litter in the seabed. The information is both qualitative and quantitative. There is a good attempt to provide quantitative information, including the amount of litter found and the percentage of litter of different compositions, usually referring to data gathered in 2007-2012. The information on marine litter in the water column refers to micro-particles in some detail.

Trends (stable) and judgements (not good) on the current level of pressure caused by marine litter are provided but only for beaches as there is insufficient information on the water column. Urban discharges, aquaculture and fisheries are listed as the main causes of marine litter in Slovenian waters. In relation to impacts on marine organisms, the information is limited to the results of a study (2001-2004) on the impact of marine litter in the stomachs of sea turtles Caretta caretta.

Conclusion on adequacy: The initial assessment of Slovenia for marine litter is considered adequate. The information reported is adequate (although more limited on impacts) in light of the current state of knowledge.
III. **Environmental targets**

*Environmental targets (reporting sheet and paper report):*

10.1. A reduction of waste on the coast, in the water column and seabed between 2012-2020, with measures to improve waste management in the region at the sources of pollution.

Associated indicator: The objective of reducing the amounts (number and weight) of waste on the shore.

Associated indicator: The objective of reducing the quantity of waste, with the aim of maintaining the quantities of micro-plastics in the environment on the basis of data from the years 2011 and 2012.

Associated indicator: The objective of reducing the quantity of waste (number) on the sea surface and seabed.

10.2. To maintain or reduce the quantity of micro-plastics on the surface between 2012-2020.

Associated indicator: Selection of indicator organism at the level of the region, the development of methods to assess the presence of waste in organisms of marine animals, the first assessment of the situation.

10.3 For the purpose of assessment, criteria and indicators have to be developed to properly cover the effects of marine litter and their degraded products (mostly plastic) on the marine ecosystem and human health.

10.4 To check the amounts and trends of waste on the seabed and the sea surface and check their relevance regarding the effects on the marine ecosystem.

Slovenia has defined four targets and four associated indicators to address Descriptor 10. In the paper report, the first two targets are referred to as “environmental objectives” and the other two as “operational objectives”. The targets are the same in the reporting sheets and in the paper report (the text is very similar) but the indicators are only reported in the reporting sheets (as are the baselines for threshold values for the indicators of Target 10.1).

The first two targets are specific, measurable, achievable, realistic and time-bound. However, it is not specified what “reducing” means (no thresholds are provided, although baselines are given for Target 10.1) and therefore any reduction will be sufficient to achieve these targets. The other two targets are operational targets and do not address the reduction of pressures or impacts. The targets proposed could be useful to guide progress towards achieving GES due to the way in which GES is defined.

**Conclusion on adequacy:** The set of environmental targets defined by Slovenia for Descriptor 10 is considered *partially adequate*. Two of the proposed environmental targets are potentially SMART; the other two are research/monitoring targets. However, the two targets addressing pressures do not include thresholds (even though one of them does refer to a baseline) and therefore any reduction will be sufficient to achieve these targets.

IV. **Consistency**

The assessment of the pressure and its impacts is not entirely consistent with the Slovenian definition of GES for Descriptor 10 – impacts are a very important part of the definition of GES but not comprehensively addressed in the initial assessment.

Two of the targets are specifically targeted at reducing specific pressures that have been identified in the initial assessment and they can be considered relevant to achieve GES, but not sufficient as they do not tackle impacts, which are an important part of the Slovenian GES definition for Descriptor 10, as already referred to above.
Section 11. Descriptor 11 (Introduction of energy)

I. Good Environmental Status (GES)

Definition of GES (reporting sheet and paper report):

11.1 The temporal and spatial distribution of impulsive noises at high, low and medium frequencies do not have significant adverse effects on marine organisms.

11.1.1 Continuous low frequency sound (ambient noise) does not have significant adverse effect on marine organisms.

Slovenia has defined their GES for Descriptor 11 at the criteria level and has applied both Criteria 11.1 and 11.2. Slovenia has not applied Indicators 11.1.1 or 11.2.1 when defining their GES nor does it have an overall GES descriptor. Both criteria specify that noise distribution and ambient noise should not have significant adverse effects on marine organisms. This ensures that that the conditions of the Descriptor as provided in Annex I of the Commission Decision are covered.

With regard to Indicator 11.1, the definition applies to high, low and medium frequency noises while the Commission Decision Criteria 11.1 refers to loud, low and mid frequency impulsive sounds. High frequencies are not covered by the Commission Decision and this inclusion by Slovenia results in a significant increase in the scope of Descriptor 11. Furthermore the exclusion of the word loud in the GES definition could potentially increase the scope of the descriptor, however since the concept of loud has not yet been defined this is unlikely to be a problem. Finally no thresholds or reference values have been provided in the GES definition.

Conclusion on adequacy: the GES definition of Slovenia for D11 is considered as partially adequate. It is based partly on the text of the indicator but has also significantly increased the scope of the descriptor by including the effects of high frequency noises which can be considered out of scope and not practical.

II. Initial Assessment

The Slovenian initial assessment has judged the level of pressure of impulsive noise as being low. The source of continuous noise has been identified as coming from shipping and Slovenia has reported in detail on noise monitoring at different points in time and at different locations. Based on the outcome of these results, Slovenia estimated that the level of continuous underwater noise in Slovenian waters is high. No thresholds or baselines were reported. The impacts of marine noise have been described in a general fashion and not specifically relating to the Slovenian situation.

Conclusion on adequacy: The initial assessment of Slovenia for underwater noise is considered adequate. Considering the data available for marine noise, Slovenia has provided data from relevant noise measurements and drawn a number of relevant conclusions regarding noise from these observations.

III. Environmental targets

Environmental targets (reporting sheet and paper report):

Target 11.1: Regulation of sectors and/or activities which emit impulsive sound.
Target 11.2: Planning of measures needed to achieve good status will be based on monitoring data, which will be launched in 2014. On that basis, the baseline and threshold values will be determined.

Target 11.3: To develop methods and approach for monitoring underwater noise at the level of the sub-region

Slovenia has set three interim operational targets for Descriptor 11. The first target relates to criterion 11.1 but it lacks details as to the types of impulsive sounds that will be considered or the types of regulations that could be implemented.

The following two targets are related to the whole of Descriptor 11. The second target is to plan measures necessary to achieve GES while the third target is to develop methods and an approach to monitor underwater noise. Neither of these targets however commits either to actually monitoring noise or implementing measures. Based on the text of the second target, it can be implied that monitoring will start in 2014.

**Conclusion on adequacy:** The targets for D11 are considered *inadequate*. The targets lack details such as thresholds and baselines, hence are not measurable, and remain quite noncommittal. The targets are not sufficient to ensure that an ambient noise measurement campaign will take place as it has been advised by TSG noise.

**IV. Consistency**

The Slovenian GES and targets for Descriptor 11 are not fully consistent with the initial assessment of the pressure from underwater noise. The GES definition and the targets both lack specific details such as thresholds and baselines; the initial assessment however is quite detailed.
Section 12. General Conclusions

Overall, the Slovenian report presents various positive and negative elements as follows:

Positive elements:
- Coverage of all descriptors
- Systematic use of EU requirements and standards (apart from Descriptor 7)
- Attempt to quantify many elements of the initial assessment with the exception of Descriptor 8
- Attempt to make a judgement on the status of the marine environment in relation to GES
- Additional studies done for the initial assessment of Descriptor 2
- Slovenia has set a threshold when setting GES for Indicator 3.3.3
- Slovenia has included an environmental target addressing recreational fisheries
- Systematic identification of knowledge and data gaps combined with several surveillance environmental targets to address these

Negative elements:
- The definition of GES is generally vague or not specific, with the exception of Descriptor 5
- For Descriptors 3 and 6, some quantitative values for GES are replaced by ‘x’ to be completed later. The same approach is followed for some of the environmental targets related to D3, D7 and D9.
- Impacts from pressure are not sufficiently reported on
- Lack of thresholds/reference conditions for environmental targets although a significant number are only interim targets
- Some environmental targets (Descriptors 2, 3, 7 and 11) are defined in a vague and general way, sometimes phrased as a GES definition
- Limited reference to the Barcelona Convention