Marine Stewardship Council
fisheries assessment

# Strait of Sicily anchovy purse seine fishery

## Pre-assessment Report

| | |
|---|---|
| Conformity Assessment Body (CAB) | Global Trust Certification Ltd, an NSF International company. |
| Assessor/Assessment team | Lead Assessor, Vito Romito (P2 and P3)<br>Assessor, Giuseppe Scarcella (P1 and P3) |
| Fishery client | MSC Italy |
| Assessment Type | Pre-assessment |
| Report Code | Pre-39.2 |
| Report Date | 16 April 2021 |

# 1 Contents



## 1.1 List of Figures



## 1.2 List of Tables



## 2 Glossary

AIS Automatic identification system
CA Consequence Analysis (RBF)
CFP Common Fisheries Policy
CPU Catch per Unit of Effort
CSA Consequence Spatial Analysis (RBF)
EEZ Exclusive Economic Zone
EFCA European Fisheries Control Agency
ETP Endangered, threatened and protected species
EU European Union
FCR Fisheries Certification Requirements
GES Good Environmental Status
GFCM General Fisheries Commission for the Mediterranean
GSA Geographical Sub-Area
LTL Low Trophic Level
MCRS Minimum Conservation Reference Size
MEDAC Mediterranean Advisory Council
MIPAAF Italian Ministry of Agriculture and Forestry
MLS Minimum Landing Size
MSC Marine Stewardship Council
PI Performance indicator
PISG Performance Indicator Scoring Guidepost
PRI Point of Recruitment Impairment
PSA Productivity-Susceptibility Analysis (RBF)
RBF Risk-Based Framework
SG Scoring Guidepost
SI Scoring Issue
SIC Sites of Important Communities
SPZ Special Protection Zone
STECF Scientific, Technical and Economic Committee for Fisheries
TAC Total allowable catch
UoA Unit of Assessment
VME Vulnerable marine ecosystems

# 3 Executive summary

## 3.1 Names and brief description of assessors/authors

This MSC pre-assessment report was drafted by the following team:

**Assessment Team Members**
Lead Assessor, P2, and traceability: Vito Romito
P1 Assessor: Giuseppe Scarcella
P3 was shared among the two assessors

**Vito Romito** has 10 years of expertise in fisheries certification. He's an ISO14001 Certified Lead Auditor and MSC FCR v.2.0 and FCP v.2.1 approved Fisheries Team Leader for SAI Global with extensive experience in ecosystems effects of fisheries. Vito received a BSc (Honours) in Ecology and a MSc in Tropical Coastal Management from Newcastle University (U.K.), in between which he worked for a year in Tanzania, carrying out comparative biodiversity assessments of pristine and dynamited coral reef ecosystems around the Mafia Island Marine Park. For five years he worked at Global Trust Certification/ later SAI Global as Lead Assessor for all the fishery assessments in Alaska, Iceland and Louisiana. Vito has also carried out several IFFO forage fisheries assessments in Chile, Peru, Europe and other various pre-assessments in Atlantic and Pacific Canada. To date, Vito has headed and conducted dozens of assessments involving 40+ different species including salmonid, groundfish, pelagic, flatfish, crustacean and cephalopod species in Europe, North and South America, and SE Asia. For three years, as a senior fisheries consultant and then manager with RS Standards Ltd., he was involved in the development and testing of a Data Deficient Fisheries framework and v.2.0 fisheries standard for the ASMI Alaska RFM Scheme, and IFFO RS Improver/FIP projects related to South East Asia multispecies bottom trawl fisheries. Vito re-joined the SAI Global Fisheries Team in 2018 and has since been involved as lead assessor and ecosystem expert in MSC and other fisheries assessment projects in the Baltic Sea, Canada, US East Coast, Alaska, Louisiana and Italy.

**Dr. Giuseppe Scarcella** is an experienced fishery scientist and population analyst and modeller, with wide knowledge and experience in the assessment of demersal stocks. He is author and co-author of more than 50 scientific papers in peer reviewed journals and more than 150 national and international technical reports, most of them focused on the evolution of fish assemblages in artificial habitats and stock assessment of demersal species. He holds a first-class degree in Marine Biology and Oceanography (110/110) from the Unversità Politecnica delle Marche, Italy, and a Ph.D. in marine Ecology and Biology from the same university, based on a thesis "Age and growth of two rockfish in the Adriatic Sea". In 2008 he was offered a job as project scientist in several research programs about the structure and composition of fish assemblage in artificial reefs, off-shore platform and other artificial habitats in the Italian Research Council – Institute of Marine Science of Ancona (CNR-ISMAR). During the years of employment at CNR-ISMAR he has gained experience in benthic ecology, statistical analyses of fish assemblages' evolution in artificial habitats, fisheries ecology and impacts of fishing activities, stock assessment, otholith analysis, population dynamics and fisheries management. During the same years he attended courses of uni-multivariate statistics and stock assessment. He is also actively participating in the scientific advice process of FAO GFCM in the Mediterranean Sea. At the moment he is member of the Scientific, Technical and Economic Committee for Fisheries for the European Commission (STECF). Giuseppe has been involved in several MSC and RFM assessments globally as a stock assessment expert.

## 3.2 Brief explanation of the process applied and summary of assessment activities

This MSC pre-assessment was carried out primarily remotely as desktop type assessment. The assessment team organised conference calls with various stakeholders as part of the remote "site visits" portion of the assessment, to collect additional information to what was publicly available and to better understand the dynamics of the fishery.

## 3.3 Main strengths and weaknesses of the client's operation

The main strengths and weaknesses with the client's operations are highlighted below:

**Strengths**

- P1. Anchovy, the target stock, appears to be at relative low risk from the fishery based on the MSC Risk Based Framework's findings.
- P2. The fishery appears to have no primary species impacts, negligible effects on ETP species and no effect on habitats, and the ecosystem effects of the fishery are considered not to be significant.
- P3. The fishery has a management system structured under the general EU CFP framework with general objectives and general means for stakeholder participation in the management and decision-making process.
- P3. A fishery specific management plan is available for the fishery.

**Weaknesses**

- P1. Although a fishery management plan is in place, the rules for specifying the management measures are not responsive to the state of the stock and there is no evidence that they work towards achieving stock management objectives. For example, the reduction of fishing effort did not follow the simulation scenarios presented in the Italian MP.
- P2. Secondary species management (i.e. that of sardine) would benefit from more precise harvest control mechanisms.
- P3. There is a lack of more specific evidence and objectives in the management plan to determine that short and long-term objectives are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2.
- P3. There is a lack of Opinions from MEDAC and an absence of GFCM decisions specific to this stock, despite challenges relating to achieving credible stock assessment results (see 2019 stock assessment report). Decision-making processes' responsiveness to serious and other important issues may be somewhat lacking.
- P3. It is not clear how fishery specific components of the management system are reviewed.
- P3. Enforcement information at the fishery level is lacking.

## 3.4 Extent to which the fishery is or is not consistent with the MSC Fisheries Standard

The fishery is largely consistent with the requirements of the MSC standard.

More detailed information on the positive aspects and gaps encountered in this report has been presented in the following pages and summarised in Table 5.

# 4 Report details

## 4.1 Aims and constraints of the pre-assessment

This pre-assessment does not attempt to duplicate a full assessment against the MSC Fisheries Standard. A full assessment involves a group of assessment team members and public consultation stages that are not included in a pre-assessment. A pre-assessment provides a provisional assessment based on a limited set of information provided by the client. In the case of this fishery data availability was generally good although additional information (e.g. harvest control rules, enforcement activities) could improve the evidence base and increase the provisional score applied.

## 4.2 Version details

The MSC process applied for this fishery is summarised in the table below.

**Table 1.** Fisheries program documents versions.

| Document | Version number |
|---|---|
| MSC Fisheries Certification Process | Version 2.2 |
| MSC Fisheries Standard | Version 2.01 |
| MSC General Certification Requirements | Version 2.4.1 |
| MSC Pre-Assessment Reporting Template | Version 3.2 |

# 5 Unit(s) of Assessment

## 5.1 Unit(s) of Assessment

### 5.1.1 Determination of fishery's status with respect to scope of the MSC Fisheries Standard

The fishery entering assessment meets the MSC Scheme scope requirements in FCP v2.2 7.4:

- The various target species assessed under Principle 1 are neither amphibians, reptiles, birds, nor marine mammals.
- The fishery does not use destructive fishing practices such as poisons or explosives.
- The fishery is not conducted under a controversial unilateral exemption to an international agreement.
- The fishery includes a mechanism for resolving disputes and disputes do not overwhelm the fishery.
- This is not an enhanced fishery, nor an introduced species-based fishery.
- Forced labour requirements have not been verified at this stage.

### 5.1.2 Possible Unit(s) of Assessment

Included in Table 2 below are possible Unit(s) of Assessment if the fishery were to proceed to full assessment including a justification for choosing them.

The fishery in question includes purse vessels targeting European anchovy (*Engraulis encrasicolus*) in GSA 16: South of Sicily (Canale di Sicilia). The vessels are operating from Trapani to Portopalo di Capo Passero and the main port of reference is the port of Sciacca (TP).

**Table 2.** Unit(s) of Assessment (UoA)

| UoA 1 | Description |
|---|---|
| Species | European anchovy (*Engraulis encrasicolus*), common name: Alici |
| Stock | European Anchovy in GSA 16: Canale di Sicilia (South of Sicily) |
| Fishing gear type(s) and, if relevant, vessel type(s) | Purse seine (PS) vessels including:<br><br>M/P MAMMA CATERINA 3PE 735<br>M/P SAN PIETRO 3PE 689<br>M/P SAN PIETRO II 3PE 742<br>M/P RITA MADRE II 3PE 718<br>Operating from Trapani to Portopalo di Capo Passero. Port of reference: Sciacca (TP). |
| Client group | MSC Italy |
| Other eligible fishers | Not defined |
| Geographical area | FAO Major Fishing Area 37, Central Mediterranean |
| Harvest method/gear | Purse seine – reti da circuizione |
| Justification for choosing the Unit of Assessment | UoA defined by the Client |

# 6 Traceability

## 6.1 Traceability within the fishery

Some traceability information for this fishery has been collected through interviews. An industry representative reported that the anchovy resource is landed locally and processed largely through local processing plants in Sicily. After processing the fish is sold in markets across Italy and internationally.

In addition to the above, we note the following. As part of EU COUNCIL REGULATION (EC) No 1224/2009, Article 58 on traceability[1], several requirements apply to Italian fisheries. These traceability requirements include the following:

1. Without prejudice to Regulation (EC) No 178/2002, all lots of fisheries and aquaculture products shall be traceable at all stages of production, processing and distribution, from catching or harvesting to retail stage.

2. Fisheries and aquaculture products placed on the market or likely to be placed on the market in the Community shall be adequately labelled to ensure the traceability of each lot.

3. Lots of fisheries and aquaculture products may be merged or split after first sale only if it is possible to trace them back to catching or harvesting stage.

4. Member States shall ensure that operators have in place systems and procedures to identify any operator from whom they have been supplied with lots of fisheries and aquaculture products and to whom these products have been supplied. This information shall be made available to the competent authorities on demand.

5. The minimum labelling and information requirements for all lots of fisheries and aquaculture products shall include:

   (a) the identification number of each lot; (b) the external identification number and name of the fishing vessel or the name of the aquaculture production unit; (c) the FAO alpha-3 code of each species; (d) the date of catches or the date of production; (e) the quantities of each species in kilograms expressed in net weight or, where appropriate, the number of individuals; (f) the name and address of the suppliers; (g) the information to consumers provided for in Article 8 of Regulation (EC) No 2065/2001: the commercial designation, the scientific name, the relevant geographical area and the production method; (h) whether the fisheries products have been previously frozen or not.

6. Member States shall ensure that the information listed in points (g) and (h) of paragraph 5 is available to the consumer at retail sale stage.

7. The information listed in points (a) to (f) of paragraph 5 shall not apply to fisheries and aquaculture products imported into the Community with catch certificates submitted in accordance with Regulation (EC) No 1005/2008.

8. Member States may exempt from the requirements set out in this Article small quantities of products sold directly from fishing vessels to consumers, provided that these do not exceed the value of EUR 50 per day. Any amendment to this threshold shall be adopted in accordance with the procedure referred to in Article 119.

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32009R1224&from=EN

9. Detailed rules for the application of this Article shall be adopted in accordance with the procedure referred to in Article 119.

**Table 3.** Traceability within the fishery.

| Factor | Description |
|---|---|
| Will the fishery use gears that are not part of the Unit of Certification (UoC)?<br><br>If Yes, please describe:<br>- If this may occur on the same trip, on the same vessels, or during the same season;<br>- How any risks are mitigated. | Yes, a part of the anchovy resource is prosecuted using midwater/pelagic trawl gear. This harvest may occur in the same season and geographical areas but not on the same trip or by the same vessels. It is not clear how risks may be mitigated. |
| Will vessels in the UoC also fish outside the UoC geographic area?<br><br>If Yes, please describe:<br>- If this may occur on the same trip;<br>- How any risks are mitigated. | No, this would not appear to be the case. |
| Do the fishery client members ever handle certified and non-certified products during any of the activities covered by the fishery certificate? This refers to both at-sea activities and on-land activities.<br>- Transport<br>- Storage<br>- Processing<br>- Landing<br>- Auction<br><br>If Yes, please describe how any risks are mitigated. | Some of the processing plants reportedly buy anchovy fished outside of GSA 16 to mitigate shortages of local anchovy during the year. It is possible that processing plants may also purchase anchovy caught in GSA 16 by pelagic trawl vessels.<br><br>It is not clear how such risks may be mitigated. |
| Does transhipment occur within the fishery?<br><br>If Yes, please describe:<br>- If transhipment takes place at-sea, in port, or both;<br>- If the transhipment vessel may handle product from outside the UoC;<br>- How any risks are mitigated. | No, this does not to appear to be the case. |
| Are there any other risks of mixing or substitution between certified and non-certified fish?<br><br>If Yes, please describe how any risks are mitigated. | Yes. If a processing plant receives anchovy bought in from outside GSA 16 and/or from vessels in GSA 16 fishing with pelagic trawls the risks of mixing certified and non-certified fish would need to be mitigated. Currently, the assessment team does not have information on how that may be achieved. |

# 7 Pre-assessment results

## 7.1 Pre-assessment results overview

### 7.1.1 Overview

The key limitations of this fishery have been briefly summarised in earlier pages. Details resulting from this pre-assessment are shown in the following pages in the form of:

- Recommendations,
- Summary of potential conditions by Principle, and
- Summary of Performance Indicator level scores

### 7.1.2 Recommendations

Key recommendations resulting from this pre-assessment include:

- The need to have more fishery-specific management measures and harvest control rule to respond to the state of the stock.
- The need to develop reference points for use in management.
- The need to update, follow up or revise the fishery management plan.
- A more specific integration of ecosystem considerations in the target stock harvest strategy.

## 7.2 Summary of potential conditions by Principle

**Table 4.** Summary of potential Performance Indicator level scores.

| Principle of the Fisheries Standard | Number of PIs with draft scoring ranges <60 |
|---|---|
| Principle 1 – Stock status | 0 PIs scored <60; 2 PIs scored 60-79 |
| Principle 2 – Minimising environmental impacts | 0 PIs scored <60; 2 PIs scored 60-79 |
| Principle 3 – Effective management | 0 PIs scored <60; 4 PIs scored 60-79 |

## 7.3 Summary of Performance Indicator level scores

The summary table of performance indicators is shown below.

**Table 5.** Summary of Performance Indicator level scores.

| Performance Indicator | Draft scoring range | Data deficient? |
|---|---|---|
| Principle 1 – Stock status | | |
| 1.1.1 – Stock status | ≥80 | Yes |
| Rationale or key points | | |
| The Risk Based Framework (RBF) has been used to score this PI, because there are no reference points available, either derived from analytical stock assessments or using empirical approaches. A score of 85 is therefore awarded for this PI. | | |
| 1.1.2 – Stock rebuilding | NA | Not applicable. |
| Rationale or key points | | |
| Not applicable. | | |
| 1.2.1 – Harvest Strategy | 60 – 79 | Not applicable. |
| Rationale or key points | | |
| Stock assessment are routinely carried out both in the framework of working group on stock assessment of small pelagic species in GFCM and in the framework of STECF (e.g.: STECF, 2013). In the present fishery unwanted catches of European anchovy are considered negligible. The management plan (MIPAFF, 2011) specific for fishing vessels registered in the Sicilian maritime compartments that practice purse seine and pelagic pair trawl fisheries, has as objective to recover the stocks within biological safety limits in agreement with CFP requirements and in accordance with MSC objectives reflected in PI 1.1.1 SG80. However, the rules for specifying the management measures are not responsive to the state of the stock and there is no evidence that they work towards achieving stock management objectives. | | |
| 1.2.2 – Harvest control rules and tools | 60 – 79 | Not applicable. |
| Rationale or key points | | |

| **Table 5.** Summary of Performance Indicator level scores. | | |
|---|---|---|
| Performance Indicator | Draft scoring range | Data deficient? |
| In the present fishery the harvest control rules are a set of management measures that include spatial and temporal limitations, which restrict the areas where fishing is allowed and protect juveniles. The fishery is also subject to effort limitations imposed by authorities. There is also a decommissioning plan on the capacity. However, it is clear that the HCR are not well defined and have not been explicitly defined or agreed, for example the reduction of fishing effort did not follow the simulation scenarios presented in the Italian MP (MIPAAF, 2011) also the MP does not clearly state what actions will be taken at what specific trigger reference point levels. | | |
| 1.2.3 – Information and monitoring | ≥80 | Not applicable. |
| Rationale or key points | | |
| A sufficient range of information, including some that may not be directly relevant to the current harvest strategy, is available (see Italian DCF National programme) as well as data used directly in the stock assessment (catch-at-age, survey and LPUE data), additional information includes changing patterns of growth, the relative spatial distribution of juvenile and adult and removals from other fleets. | | |
| 1.2.4 – Assessment of stock status | ≥80 | Not applicable. |
| Rationale or key points | | |
| If the RBF is used to score PI 1.1.1, this PI is not scored and is awarded a default score of 80 (see MSC FCP 2.1: PF1.1.2 & Table PF1). | | |
| Principle 2 – Minimising environmental impacts | | |
| 2.1.1 – Primary Outcome | ≥80 | No |
| Rationale or key points | | |
| There are no main or minor primary species in the UoA in question. The UoA scores ≥80. | | |
| 2.1.2 – Primary Management | ≥80 | Not applicable. |
| Rationale or key points | | |
| There are no main or minor primary species in the UoA in question. The UoA scores ≥80. | | |
| 2.1.3 – Primary Information | ≥80 | Not applicable. |
| Rationale or key points | | |
| There are no main or minor primary species in the UoA in question. The UoA scores ≥80. | | |
| 2.2.1 – Secondary Outcome | ≥80 | No |
| Rationale or key points | | |
| European pilchard (*Sardina pilchardus*) is the only main secondary species identified in this UoA. The 2019 GFCM WGSASP report considered this stock to be undergoing overexploitation. The advice was to reduce exploitation. The WG endorsed as validated assessment the a4a model and considered it as quantitative advice due to uncertainties in the terminal year estimates. Due to the short time series no biomass reference point was estimated. Due to the lack of reference points or an understanding of biological based limits, the species was assessed using the MSC RBF's PSA tool, as per MSC requirements. Sardine achieves an MSC PSA-derived score of 84. | | |
| 2.2.2 – Secondary Management | 60 – 79 | Not applicable. |
| Rationale or key points | | |
| Sardine is the only main secondary species in this UoA. The Italian fisheries management system is largely based on fishing effort control through input measures. The fishing effort is managed through:<br>c) fishing licenses: fish resources can be exploited only by subjects holding a regular license (law no. 41/1982);<br>d) control of fishing capacity: capacity cannot exceed at any time the limits set by Regulation (EU) No 1380/2013 (Annex II: for Italy, 173,506 GT and 1,070,028 kW).<br><br>The management system also includes a number of important technical measures, which were introduced by Regulation (EU) No 1967/2006 (Mediterranean Regulation). The most important with relevance to sardine involve: minimum mesh size of 14 mm (for surrounding nets), a minimum landing size (MLS) of 11 cm (Member States may convert the minimum size into 55 specimens per kg), logbook recording requirements above 50Kg of live catches, and the length of netting shall be restricted to 800 m and the drop to 120 m.<br><br>Furthermore, a Fishery Management Plan for small pelagics such as anchovies, sardine and mackerel caught with purse seines in Sicily (including GSA 16) has been published in 2011. The objective of the management plan is the recovery of stocks within safe biological limits. The management plan called for: | | |

| **Table 5.** Summary of Performance Indicator level scores. | | |
|---|---|---|
| Performance Indicator | Draft scoring range | Data deficient? |
| 5) 3% reduction in effort,<br>6) Fishing season from 15th of March to 15th of November,<br>7) Fishing permits,<br>8) Data collection (fleet capacity, effort, CPUE, biological data such as length, age and discards).<br><br>Fishing mortality on the stock is uncertain but appear to be either high and slightly decreasing or increasing over the past 4 years. When considering that the most recent stock assessment advised for a reduction in exploitation due to overexploitation, and due the lack of more direct measures to control exploitation (e.g. output controls), we cannot determine that there is a partial strategy in place, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species to ensure that the UoA does not hinder their recovery. | | |
| 2.2.3 – Secondary Information | ≥80 | Not applicable. |
| Rationale or key points | | |
| In the Strait of Sicily, since 1998, the IAMC-CNR of Mazara del Vallo has been carrying out with regularity (at least once a year) acoustic surveys aimed at assessing the abundance and the spatial distribution of two fish species of small pelagics of particular interest economic: sardine, *Sardina pilchardus* and anchovy, *Engraulis encrasicolus*. Survey and catch information is recorded and is available for stock assessment purposes (e.g. as used by the GFCM's WGSASP). Additional information is collected as part of the Italian DCF National programme. Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status. However, we cannot determine that quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status (i.e. the fishery is not actively managed using biomass or fishing mortality based reference points). | | |
| 2.3.1 – ETP Outcome | ≥80 | No |
| Rationale or key points | | |
| The fishery may have some minor interactions with short-beaked common dolphin *Delphinus delphis*. In terms of risk from this fishery, a fishermen representative reported that fishermen are very careful about releasing the net or backing away from any dolphin that may get close to the nets during fishing operations to avoid issues. Dolphins are known to damage gear and scare off and scatter anchovies and as such may ruin a fishing trip. The risk to these animals is considered low and even if they were to get caught in the net, they would reportedly be let go by lowering and raising the net, or released alive in the case of capture. The very low risk of bycatch and mortality to dolphins was confirmed uniformly by interview with GFCM staff, a fishermen representative and a researcher from the CNR. Direct effects of the UoA are highly likely to not hinder recovery of ETP species. | | |
| 2.3.2 – ETP Management | ≥80 | Not applicable. |
| Rationale or key points | | |
| The short-beaked common dolphin is managed in the Mediterranean Sea through the 2004 ACCOBAMS Conservation Plan. The actions proposed in the plan have been divided into five broad categories: 1) Management (including objectives relating to bycatch reduction in drifnet fisheries and management of epipelagic fisheries), 2) Legislation, 3) Research, 4) Capacity building, and 5) Awareness & Education. The ACCOBAMS parties meet every 3 years to review management measures and conservation needs of marine mammals in the Mediterranean Considering the low apparent risk to this species from the UoA (and consequent limited need for management), and the strategy highlighted in the Conservation Plan we can determine that there is a strategy in place that is expected to ensure the UoA does not hinder the recovery of ETP species. | | |
| 2.3.3 – ETP Information | ≥80 | Not applicable. |
| Rationale or key points | | |
| Although there is no apparent fishery specific information regarding the interaction of the UoA with dolphins, information gathered though stakeholder's interviews indicate that the risk of mortality to this species appears to be very limited. Also, the IUCN Red list page for the common dolphin indicates that drift gillnets would be the gear that most affects this species. Drift nets are also mentioned in the ACCOBAMS conservation plan as the high-risk gear type responsible for bycatch mortality. Purse seine gear is not mentioned in the plan. Hence, based on the apparent limited risk from purse seine gear, some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. | | |
| 2.4.1 – Habitats Outcome | ≥80 | No |
| Rationale or key points | | |

| **Table 5.** Summary of Performance Indicator level scores. | | |
|---|---|---|
| Performance Indicator | Draft scoring range | Data deficient? |
| Commonly encountered habitats have been identified as the water column since this gear does not come into contact with the seabed and operates primarily within the water column and the surface. VMEs were identified as marine seagrasses and coralligenous communities. The overall risk to benthic habitat and species is deemed low to negligible for this gear type. | | |
| 2.4.2 – Habitats Management | ≥80 | Not applicable. |
| Rationale or key points | | |
| Management measures or strategy to manage this gear type's effects on habitats is not strictly required. Hence, we can determine that there is a strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats. | | |
| 2.4.3 – Habitats Information | ≥80 | Not applicable. |
| Rationale or key points | | |
| The overall risk to benthic habitat and species is deemed low to negligible for this gear type. The very low risk of gear contact with the seabed or habitat types was also confirmed by interview with a fishermen representative and a researcher from the CNR. All in all, habitat distribution is not explicitly relevant to this type of gear as it operates in the water column. The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats. | | |
| 2.5.1 – Ecosystems Outcome | ≥80 | No |
| Rationale or key points | | |
| A holistic food web model (quantitative Ecopath with Ecosim model; Agnetta et al., 2019) has been developed in the Strait of Sicily in order to understand the interplay between the benthic pelagic coupling and mixed fisheries in a Mediterranean system. According to the model outputs, the bulk of consumption fluxes (~95%, 1500 t km-2 years-1) was exchanged by lower "taxonomic" groups (i.e. macro-benthos, zooplankton, euphausiids and bacteria) across the benthic and pelagic domains. The remaining consumption flux (~ 5%) was determined by all other functional groups, with epipelagic fish (EPI) and mesopelagic fish crustacean feeders (MSC) having the most relevant flows for benthic-pelagic coupling both as consumers and sources. Many other functional groups FGs (e.g., horse mackerel *Trachurus spp*., TRA and sardine, SAR), contributed to a less extent to the consumption fluxes linked to BPC although they had high biomass and were predators and preys across benthic and pelagic domains as well. Due to the large amount of links in the Strait of Sicily foodweb, and considering the high productivity and relative low susceptibility of the species as derived by the RBF's CA and PSA analysis, there is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. | | |
| 2.5.2 – Ecosystems Management | 60 – 79 | Not applicable. |
| Rationale or key points | | |
| Stock assessments are routinely carried out both in the framework of working group on stock assessment of small pelagic species in GFCM (e.g.: 2019 GFCM WGSASP report) and in the framework of STECF (e.g.: STECF, 2013). The management plan (MIPAFF, 2011) specific for fishing vessels registered in the Sicilian maritime compartments that practice purse seine and pelagic pair trawl fisheries, has as objective to recover the stocks within biological safety limits in agreement with CFP requirements. Such recovery has a bearing on the ecosystem structure and function. Management measures include minimum landing sizes, spatial and temporal limitations which restrict the areas where fishing is allowed and protect juveniles. The fishery is also subject to effort limitations imposed by authorities. There is also a decommissioning plan on the capacity. Given the fact that anchovy is a highly productive species the team concludes that removal from the fishery is maintained at levels below that which is likely to cause a risk to the target species. RBF scores confirm that the species is not at high risk from exploitation. However, in Italy, the performance of the harvest strategy in place to manage small pelagics in the Strait of Sicily has not been fully evaluated. The Italian MP (MIPAAF, 2011) does not clearly state what actions will be taken at what specific trigger reference point levels. Furthermore, the existing HCR is not well defined and has not been explicitly defined or agreed, for example, the reduction of fishing effort did not follow the simulation scenarios presented in the management plan. Hence, we cannot determine that there is some objective basis for confidence that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved. | | |
| 2.5.3 – Ecosystems Information | ≥80 | Not applicable. |
| Rationale or key points | | |
| A holistic food web model (quantitative Ecopath with Ecosim model; Agnetta et al., 2019) has been developed in the Strait of Sicily in order to understand the interplay between the benthic pelagic coupling and mixed fisheries in a Mediterranean system. The reconstruction of the food web required review and integration of a vast set of local and regional biological information from bacteria to large pelagic species that were aggregated into 72 functional groups. | | |

| **Table 5.** Summary of Performance Indicator level scores. | | |
|---|---|---|
| Performance Indicator | Draft scoring range | Data deficient? |
| Fisheries in the region were described by 18 fleet segments resulting from combination of fishing gears and fishing vessel size. Input data included biological and diet data, as well as MEDITS survey relative abundance for most species, and acoustic survey information for anchovy and sardine. The role of the species and fishery under assessment here were broadly elucidated in the study. Information is adequate to broadly understand the key elements of the ecosystem. Also, main impacts of the UoA on these key ecosystem elements (i.e. removal of small pelagics) can be inferred from existing information, and some have been investigated in detail. | | |
| Principle 3 – Effective management | | |
| 3.1.1 – Legal and customary framework | ≥80 | Not applicable. |
| Rationale or key points | | |
| Italy has an effective national legal system and binding procedures listed within comprehensive suite of fisheries legislation that is updated to implement commitments under the EU's CFP and the under the GFCM. Membership of the EU requires co-operation with other parties to deliver such management outcomes under the Common Fisheries Policy. The fishery is managed within the context of the CFP and the Italian national system for fisheries management. At regional level, management of the fishery is based on multi stakeholder input from the Regional Advisory Bodies (here MEDAC). Scientific advice and input on various aspects of fisheries management and conservation is provided by the European Commission's Scientific, Technical and Economic Committee for Fisheries (STECF). The GFCM has the authority to adopt binding recommendations for fisheries conservation and management in its area of application and plays a critical role in fisheries governance in the region. Disputes in the fishery may be settled at two levels, the EU level and the national level in Italy. At national level in Italy, there are a number of mechanisms to support the interests of smaller fishing vessels and coastal communities, including so-called Fishery Local Action Groups (FLAGs), of which there is a number in Sicily, which design and implement a local development strategy to address economic, social and/or environmental needs. Based on their strategies, the FLAGs select and provide funding to local projects that contribute to local development in their areas, involving thousands of local stakeholders. | | |
| 3.1.2 – Consultation, roles and responsibilities | ≥80 | Not applicable. |
| Rationale or key points | | |
| The EC through the CFP sets framework for fisheries management, which is then implemented by the Italian ministry (implements the CFP and GFCM binding recommendations). MEDAC is the main regular consultation process that enables local knowledge from the sector to be routinely considered in development of the management system. MEDAC at regional level and developing Fisheries Local Action Group (hereafter FLAG) at local level (in Sicily), along with the development of the Better Regulation Guidelines ensures more effective and routine consultation which is thought to be a recent improvement in performance. Federpesca and Federcoopesca are industry bodies representing the Italian catching sector as members of MEDAC. The functions and relationships between these management, industry and advisory groups are, therefore explicitly defined and understood by key areas of responsibility. | | |
| 3.1.3 – Long term objectives | ≥80 | Not applicable. |
| Rationale or key points | | |
| The CFP Basic Document requires that member states, in accordance with international treaties such as the 1982 Law of the Sea Convention, the 1993 FAO Compliance Agreement and the 1995 Fish Stocks Agreement, apply the precautionary approach to fisheries management, and aim to ensure that exploitation of living marine biological resources restores and maintains populations of harvested species above levels which can produce the maximum sustainable yield. GFCM long term objectives are also geared towards the use of the precautionary approach and preventing overfishing. | | |
| 3.2.1 – Fishery specific objectives | 60-79 | Not applicable. |
| Rationale or key points | | |
| In 2011 the Italian Ministry of Agricultural, Food and Forestry Policies (hereafter MIPAFF) approved (Decreto Dirett. 20 settembre 2011 n. 6) a management plan (MIPAFF, 2011) specific for fishing vessels registered in the Sicilian maritime compartments that practice purse seine fishing. The objective of the management plan is to recover the stocks within biological safety limits. The plan aims to achieve, in the case of fishing for small pelagics, an improvement of sustainability by controlling the rate of exploitation and monitoring the amount of biomass available. The management plan called for:<br><br>1) 3% reduction in effort,<br>2) Fishing season from 15th of March to 15th of November,<br>3) Fishing permits,<br>4) Data collection (fleet capacity, effort, CPUE, biological data such as length, age and discards). | | |

| **Table 5.** Summary of Performance Indicator level scores. | | |
|---|---|---|
| Performance Indicator | Draft scoring range | Data deficient? |
| However due to the lack of more specific evidence and objectives in the management plan we cannot determine that short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system. | | |
| 3.2.2 – Decision making processes | 60-79 | Not applicable. |
| Rationale or key points | | |
| Italy developed a management plan for small pelagics fisheries in GSA 16, in 2011. This represents somewhat of a formulation of a decision-making processes that result in measures (e.g. fishing effort restrictions) and strategies (data collection, scientific advice, effort restriction, etc.) to achieve some fisheries objectives (effort reduction). We note, also the lack of Opinions from MEDAC and the absence of GFCM decisions specific to this stock, despite challenges relating to achieving credible stock assessment results (see 2019 stock assessment report), or the need to better integrate potential ecosystem needs in the assessment framework, which does not allow us at the moment, to determine that decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions. | | |
| 3.2.3 – Compliance and enforcement | 60-79 | Not applicable. |
| Rationale or key points | | |
| Monitoring, control and surveillance in the fishery is conducted by the EU member states through their national enforcement bodies. The European Fisheries Control Agency (EFCA), established in 2005, coordinates the EU member state's fisheries control and inspection activities and provides assistance in the application of the CFP. The Mediterranean is one of the area subject to the Joint Development Plan (JDP) inspection framework of ECFA. The Italian Coastguard manages monitoring control and surveillance of Italian vessels. Relevant statistics on sanctions and inspections are not available for the UoA but only for the whole Italian fleets on "Ecomafie" report 2018. Therefore, it is not possible to demonstrate the efficacy of the MCS mechanism, but it is possible just to infer an expectation of efficacy. Due to the lack of specific evidence or information from stakeholders, we cannot determine, at this stage that there is no evidence of systematic non-compliance. | | |
| 3.2.4 – Management performance evaluation | 60-79 | Not applicable. |
| Rationale or key points | | |
| The EU CFP is reviewed in connection with the major revisions of its basic regulations every tenth year. In 2009, the Commission analysed the functioning of the CFP based on the Green Paper on the Reform of the Common Fisheries Policy. Enforcement is member states is reviewed by the EFCA, which in turn was audited by the Internal Auditing Service (IAS) in September 2018. In terms of scientific advice, the mechanism in place to evaluate some parts of the fishery-specific management system are the scientific working groups (both in the framework of SAC-GFCM and STECF) evaluating the status of the stocks. The 2019 meeting of WGSASP was attended by 41 participants from GFCM member countries and by representatives of the FAO regional projects and the European Commission (DG MARE), as well as the GFCM Secretariat. During benchmark sessions the use of external reviewers is common and in 2019 an external reviewer was recommended for the GSA 1 benchmark session. Hence, there are mechanisms in place to evaluate some parts of the fishery-specific management system. However, the assessment team is not aware of additional mechanism to review other components (e.g. enforcement, fishery management plan revisions). | | |

## 7.4 Principle 1

### 7.4.1 Principle 1 background

Most of the following information about the target species and stock is taken from Donato et al. (2017); STECF, 2013 and GFCM, 2019.

#### 7.4.1.1 Biology of European anchovy

The European anchovy [*Engraulis encrasicolus* (Linnaeus, 1758)] is a marine, pelagic, coastal fish distributed in all Italian seas in the Mediterranean, the Black Sea and the Sea of Azov, with rare individuals found in the Suez Canal and the Gulf of Suez. It is also present in the eastern Atlantic, from Scandinavia to South Africa (Whitehead et al., 1988; Bellido et al., 2000). Vertical distribution in the water column varies with ontogeny. Eggs are found in the surface layer, generally within 10 m of depth (Olivar et al., 2001) with the highest concentration within 1 m from the surface (Coombs et al., 1997). Usually, the larvae show a vertical distribution similar to that of the eggs, floating at about 6-8 m from the surface (Coombs et al., 1997).

Nycthemeral migrations have been reported for individuals of 8-10 mm in the area of the Po river delta, with abundances up to 6-8 m of depth at night and at 16-18 m in daytime (Coombs et al., 1997). Similar migrations were observed by Olivar et al. (2001) in the North-western Mediterranean.

Distribution of larvae and post-larvae in the water column is primarily linked to food availability (Regner, 1985). Adult individuals show migration patterns along the water column as well. In daytime, anchovies form schools which descend towards deep waters (Sala et al., 2002; Tsagarakis et al., 2012) in search of food and to escape predators (Pitcher, 1986). However, during the night, and especially in the spawning season, mature individuals rise above the thermocline (40-50 m) to release gametes (Palomera, 1991).

Significant relationships were observed between the average size of anchovies and the depth at which they were caught. Larger individuals were found at greater depths (Sala et al., 2002), namely 100-180 m of depth in the Mediterranean, and 60-70 m in the Black Sea (Fischer et al., 1987a). In the northern and central Adriatic Sea, in winter, adults are found along the water column at more than 50 m depth (Piccinetti, 1970).

The European anchovy is a gregarious pelagic species, aggregating in very large schools which may also be composed of different species and include specimens of similar size. Schools approach the coast in spring and summer, attracted by the abundance of food (Tortonese, 1970). Juveniles and adults inhabit the neritic zone and the epipelagic zone, respectively. The species is euryhaline and eurytherm, as it tolerates salinity changes comprised between 5 and 41 psu, and temperature between 6 and 29 °C (Bini, 1966-1970). This characteristic enables it to penetrate into lagoons, brackish lakes and estuaries (Ragusa, 2000).

The species mainly feeds on zooplankton, especially copepods, molluscs larvae, fish eggs and larvae (Bänärescu, 1964; Borme, 2006).

Post-larvae feed on copepods of different developmental stages (eggs, nauplii, meta-nauplii and copepodites) and rarely on phytoplankton (Regner, 1985), in the daytime. Larvae up to 8 mm feed on eggs and nauplii only, while larger individuals have a diet similar to adults, preying on small copepods such as Oithona spp. (Coombs et al., 1997).

Other studies in the Adriatic Sea indicate the absence of phytoplankton in the diet of larvae, which are exclusively zooplanktivorous (Coombs et al., 1997; Conway et al., 1998; Borme, 2006). Juvenile and adult anchovies are mainly preyed by hake (*Merluccius merluccius*) (Froglia, 1973), mackerel (*Scomber scombrus*), tunas (particularly young *Thunnus thynnus*; Orsi Relini et al., 1999a) and other species of large pelagic fish, seabirds and dolphins (Coll et al., 2007).

This species can grow up to a maximum of 20 cm TL, with a relatively short lifespan (4-6 years) (Padoan, 1963; Mužinić, 1972; Sinovčić, 1978, 1988, 2000a; Pertierra and Morales-Nin, 1989). It shows an initial fast growth, reaching sexual maturity at the end of the first year of life. In the Mediterranean Sea it has a prolonged

spawning season, generally between late spring and summer (Palomera et al., 2007; Morello and Arneri, 2009; Arneri et al., 2011).

Larval growth is strongly influenced by temperature, food availability, oxygen and salinity (Regner, 1985; Dulcˇic´, 1997). McFadzen and Franceschini (1997) estimated growth rates of 0.42-0.54 mm/ day in 4-8 mm larvae off the mouth of the Po river. In the northern Adriatic Sea, growth rates were estimated between 0.43 and 1.06 mm/day in 3-14.3 mm larvae (Dulcˇic´, 1997).

In Sicily, a growth rate of 0.62-0.71 mm/day was estimated in 8-11 mm larvae (Garcìa Lafuente et al., 2002). Growth rates for post-larvae between 30 and 60 mm were calculated in different seasons, ranging between 0.55-0.72 mm/day (Arneri et al., 1998; La Mesa et al., 2009).

As for adults, growth parameters were calculated by the von Bertalanffy growth equation, as summarized in Table 6.

**Table 6.** Von Bertalanffy growth function parameters. Source: Donato et al., 2017.

| GSA/Area | Method | Sex | $L_\infty$(TL, cm) | k | $t_0$ | Reference |
|---|---|---|---|---|---|---|
| GSA 9<br>Ligurian & North Tyrrhenian Sea | OR | C | 17.50 | 0.60 | –0.80 | De Ranieri, 2010 |
| GSA 10<br>South Tyrhhenian Sea | OR | C | 21.00 | 0.36 | –1.50 | Spedicato, 2009 |
| GSA 16<br>South of Sicily | OR | C | 18.00 | 0.41 | –1.95 | Gancitano *et al.*, 2010a |
| GSA 17<br>Northern Adriatic Sea | OR | C | 16.14 | 0.40 | –2.04 | Cingolani *et al.*, 2008 |
| GSA 18<br>Southern Adriatic Sea | OR | C | 15.87 | 0.55 | –1.73 | Santojanni *et al.*, 2011a |
| GSA 19<br>Western Ionian Sea | OR | C | 20.00 | 0.26 | –1.50 | Carbonara, 2009 |

During the spawning season, each female releases at different times several batches of eggs (batchspawner), that remain in the water column (pelagic eggs) (Blaxter and Hunter, 1982). On average, each batch is made up of 12000 eggs (Bello and Casavola, 1997). Reproduction takes place in warmer months, usually between April and October. Nonetheless, occurrence of eggs was recorded in February (Zavodnik, 1970) as well as in November (Regner, 1972). Many authors agree that the beginning of the spawning season strongly depends on temperature (Palomera, 1992; Motos, 1996; Basilone et al., 2006). Adults form schools of various sizes in spring and summer, which move in shallow waters where each female lays up to 40000 eggs. Eggs are buoyant, ellipsoidal, with no oily drops, and a diameter of about 1.1-1.3 mm (Varagnolo, 1965; Regner, 1972; Ragusa, 2000). In the Adriatic Sea, anchovies spawn in a wide area, but more intensively in the northernmost areas and, in particular, off the Po river delta (Piccinetti, 2001). As reported by several authors (Karlovac, 1963; Vučetić, 1963; Gamulin, 1964; Varagnolo, 1965; Štirn, 1969, 1970), occurrence of eggs throughout the northern and central Adriatic Sea indicates the lack of preferential spawning grounds. The frequent finding of eggs and larvae in hypo-saline waters indicates that coastal areas mostly affected by fluvial deposits are preferred for fertilization of eggs (Gamulin and Hure, 1983; Palomera and Sabates, 1990). In the Ligurian Sea, the spawning period extends from May to August (Petrillo et al., 2000). In the Strait of Sicily, the spawning season lasts from March to October with a spawning peak in June and July. The reproductive cycle is synchronized to the annual trend of temperature, which shows a main peak of 25° C in summer. Indeed, the spawning season of anchovy begins as temperature increases in late spring and extends throughout the summer (Basilone et al., 2006). A more recent study indicated a spawning habitat preference for temperature of 18-19 °C, if the average temperature in the uppermost 40 m layer of the water column is considered (Basilone et al., 2013).

Table 7 shows the reproductive parameters, such as spawning season, size at first sexual maturity and gonadosomatic index in the different GSA investigated. The spawning season is generally from April to October. The size at first maturity, investigated in some areas only, is between 8.6 and 12.3 cm TL. The gonadosomatic index was calculated only in GSA 9 and 16, evidencing a similar value (3.5-4.0%).

**Recruitment**

Nursery areas are located in the Adriatic Sea off the mouth of the Po river (Gulf of Trieste) and the Gulf of Manfredonia (Morello and Arneri, 2009). In the Gulf of Manfredonia, a considerable amount of post-larvae and juveniles occurs between October and January (Casavola et al., 1985, 1987; Marano et al., 1998a). In the Strait of Sicily, spawners occur along the southern coast of Sicily, mainly in the central and eastern part (Basilone et al., 2013). The occurrence of a large number of larvae off the South-eastern tip of the Sicilian coast supports the hypothesis that larvae are transported South-eastwards up to Cape Passero (Garcìa Lafuente et al., 2002) where they constitute the main nursery area (Garcìa Lafuente et al., 2005).

**Table 7 - Reproductive period and size at first maturity. Source: Donato et al., 2017.**

| GSA/Area | Spawning period | Sex | $L_{50}$ (TL, cm) | Reference |
|---|---|---|---|---|
| GSA 9<br>Ligurian & North Tyrrhenian Sea | May-Aug | C | 11.6 | De Ranieri, 2010<br>Petrillo *et al.*, 2000 |
| GSA 10<br>South Tyrrhenian Sea | Mar-Oct | - | - | Bitetto *et al.*, 2012b |
| GSA 16<br>South of Sicily | Mar-Oct | F | 12.3 | Gancitano *et al.*, 2012<br>Basilone *et al.*, 2006 |
| | | M | 11.5 | |
| | | F | 11.2 | |
| | | M | 11.3 | |
| GSA17<br>Northern Adriatic Sea | Apr-Oct | F | 8.6 | Morello & Arneri, 2009<br>Rampa *et al.*, 2005 |
| GSA 18<br>Southern Adriatic Sea | May-Oct | - | - | Casciaro *et al.*, 2012 |

### 7.4.1.2 Exploitation of European anchovy

Anchovy is one of the major species of commercial interest in the central and northern Adriatic and, more generally, in the whole Mediterranean. This species is caught by: 1) midwater pair trawls (known as volanti), which are almost exclusively used in the Adriatic Sea; 2) purse seines that use light sources (known as lampare) to attract fish; 3) small gillnets; 4) bottom trawl; 5) boat seines for juveniles (forbidden in 2011), which are mostly used in Sicily, as well as in the Ligurian, Tyrrhenian and Ionian seas. It is worth mentioning that besides the fishing closure for midwater pair trawls in summer, a minimum conservation reference size of 9 cm TL was set (Reg. EC No. 1967/2006).

Table 8 shows some information on population demographic structure in different Italian GSAs. Anchovy is only caught by purse seine in the Ligurian and in the central and northern Tyrrhenian Sea. Size frequency distributions are unimodal (12 cm TL); anchovy is almost totally discarded by trawlers, whose catches are however scarce (De Ranieri, 2010). In the central and southern Tyrrhenian Sea, demographic composition of landings is between 9 and 16 cm TL, with a modal size of 11-11.5 cm TL.

**Table 8 - Frequency distribution (TL=cm), modal classes and modal age by area (GSA). Source: Donato et al., 2017.**

| GSA/Area | Length range (cm TL) | Modal classes (cm TL) | Modal Age | Reference |
|---|---|---|---|---|
| GSA 9<br>Ligurian & North Tyrrhenian Sea | - | 12.0 | - | De Ranieri, 2010 |
| GSA 10<br>South Tyrrhenian Sea | 9.0-16.5 | 11.0-11.5 | 0 | Spedicato, 2009 |
| GSA 16<br>South of Sicily | 7.0-17.0 | 13.0-13.5 | 2 | Gancitano *et al.*, 2010a |
| GSA 17<br>Northern Adriatic Sea | 8.0-15.0 | 12.5 | 0-1 | Santojanni *et al.*, 2012 |
| GSA 19<br>Western Ionian Sea | 7.0-16.0 | - | 0 | Carbonara, 2009 |

This species is almost entirely fished by purse seine, consisting mainly of young of the year (0 fish) (Spedicato, 2009). In the Adriatic Sea, size distribution of landings is between 8 and 15 cm TL, with a modal size of 12.5 cm TL. The species is caught by purse seine and midwater pair trawl, and includes 0 to 3 years old fish with a predominance of age 0-1 year old individuals (Santojanni et al., 2012). Fig. 2 shows the number of individuals per length class landed by mid-water pair trawlers and lampara nets in GSA 17. In the Ionian Sea, anchovies are mostly caught by purse seine. The size range is between 7 and 16 cm TL, including 0-5 years old fish, with a prevalence of young of the year (Carbonara, 2009). In the Strait of Sicily, the species is caught by purse seiners and mid-water trawlers. Size distribution ranges from 7 to 17 cm TL, with a modal size of 13.0-13.5 cm TL. Age ranges from 0 to 3 years with a predominance of individuals of 2 years of age (Gancitano et al., 2010a). On the overall, the discard of anchovy is a phenomenon of minor relevance, both as total amount and percentage on total catches. In particular, the discard of specimens below the minimum size is negligible, with no substantial differences between mid-water trawlers and lampara net (Sartor, 2014).

#### 7.4.1.3 Stock unit of European anchovy in GSA 16

The main distribution area of the anchovy stock in GSA 16 is the narrow continental shelf area between Mazara del Vallo and the southernmost tip of Sicily, Cape Passero (Patti et al., 2004; Giannoulaki et al., 2012). Daily Egg Production Method (DEPM) surveys were also carried out starting from 1998, giving also information on spawning areas distribution. Therefore, the stock is not considered to be shared with other countries as Malta or Tunisia (STECF, 2013).

#### 7.4.1.4 Fishery and Management regulation in GSA 16

In Sciacca port, the most important base port for the landings of small pelagic fish species along the southern Sicilian coast (GSA 16), accounting for about 2/3 of total landings in GSA 16, two operational units (OU) are presently active, purse seiners and pelagic pair trawlers. The fleet in GSA 16 is composed by about 50 units (17 purse seiners and 30 pelagic pair trawlers were counted up in a census carried out in December 2006). In both OUs, anchovy represents the main target species due to the higher market price.

Fisheries practices are affected by EU regulations through the Common Fisheries Policy (CFP), based on the following principles: protection of resources; adjustment of (structure) facilities to the available resources; market organization; and definition of relationships with other countries.

The main technical measures regulating fishing concern minimum landing size (9 cm for anchovy), mesh regulations (20 mm for pelagic pair trawlers, 14 mm for purse seiners) and restrictions on the use of fishing gear. Towed fishing gears are not allowed in the coastal area in less than 50 m depth, or within a distance of 3 nautical miles from the coastline. A seasonal closure for trawling, generally during summer-autumn, has

been established since 1993. In GSA 16, two operational units fishing for small pelagic are based in Sciacca port: purse seiners (lampara vessels, locally known as “Ciancioli”) and midwaters pair trawlers (“Volanti a coppia”). Midwaters trawlers are based in Sciacca port only, and receive a special permission from Sicilian Authorities on an annual basis. Another fleet fishing on small pelagic fish species, based in some northern Sicilian ports, was used to target on juvenile stages (mainly sardines). However this fishery, which in the past was allowed for a limited period (usually one or two months in the winter season) by a special Regional law renewed year by year, was no more authorized starting from 2010 and it is presently stopped.

Landings data were obtained within the framework of DCF and from the census data collection carried out by IAMC-CNR (Mazara del Vallo) in Sciacca port since 1998. Information collected in the framework of CA.SFO study project (Patti et al., 2007) showed that landings in Sciacca port account for about 2/3 of the total landings in GSA 16. Average anchovy landings in Sciacca port over the period 1998-2011 were about 2,100 metric tons, with large inter-annual fluctuations.

It is worth noting that, though anchovy biomass was decreasing during the last years (with the only exception of 2010, when the stock experienced a significant increase), landings levels over the same period remained relatively high, indicating high levels of vulnerability in the resource in term of population size.

Discards are estimated to be less than 5% of total catch for both the pelagic pair trawl and the purse seine fisheries (Kallianiotis & Mazzola, 2002). Fishing effort data refer to census data collected in Sciacca port, the most important base port for the landings of small pelagic fish species along the southern Sicilian coast (GSA 16), accounting for about 2/3 of total landings in GSA 16.

Fishing effort data refer to 2019 DCF Fisheries Dependent Information (FDI) data call for the period 2015-2018 and 2015 DCF Med and Black sea data call for the period 2005-2014 and are expressed in nominal effort (kW x fishing days; **Error! Reference source not found.**). The fishing effort time series show a clear decrease for the purse seine fleet while the pelagic pair trawl fleet shows a rather stable trend.

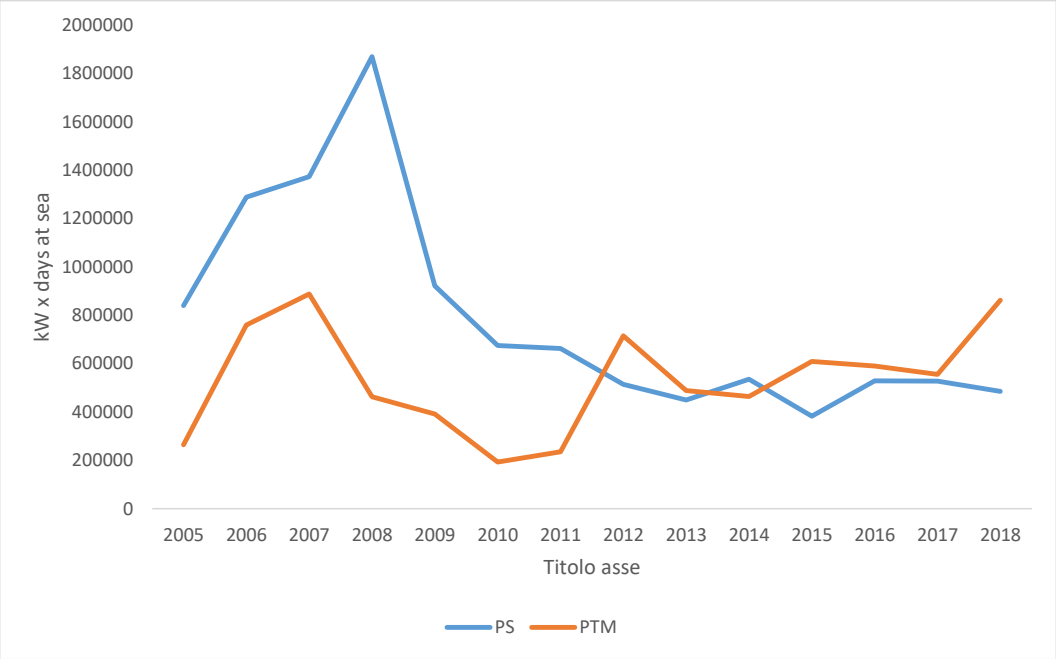



**Figure 1-** Effort data regarding the purse seine (PS) and pelagic pair trawl (PTM) fleets in GSA 16. Sources: 2019 DCF Fisheries Dependent Information (FDI) data call for the period 2015-2018 and 2015 DCF Med and Black sea data call for the period 2005-2014.

#### 7.4.1.4.1 Italian management plan of small pelagic fleets operating in GSA 16

In 2011 the Italian Ministry of Agricultural, Food and Forestry Policies (hereafter MIPAFF) approved (Decreto Dirett. 20 settembre 2011 n. 6) a management plan (MIPAFF, 2011) specific for fishing vessels registered in the Sicilian maritime compartments that practice purse seine fishing. In the same plan management measures are also provided for those trawlers, provisionally authorized to use pelagic pair trawl, based in the port of Sciacca which operate exclusively in GSA 16. The objective of the management plan is to recover the stocks within biological safety limits. According to the management plan, scientific analyses of the state of exploitation relating to the stocks of the main species have shown an over-exploitation condition with regard to the anchovy (*Engraulis encrasicolus*) and full exploitation as regards sardine (*Sardina pilchardus*), while there are insufficient scientific indications on the other species (mackerel and horse mackerel) subject to these types of fishing. There is a need to make the fishing intensity compatible with the potential for biological renewal of the species subject to this activity. The plan aims to achieve, in the case of fishing for small pelagics, an improvement of sustainability by controlling the rate of exploitation and monitoring the amount of biomass available.

The objective can be achieved through the implementation of the adjustment plan provided for by the national Operational Program associated with the measures referred to in this management plan.

The management measures included in the management plan are proportionate to the aims, objectives and expected calendar, and take into account the following factors:

- the state of conservation of the stock or stocks;
- the biological characteristics of the stock or stocks;
- the characteristics of the fishing activities during which the stocks are caught;
- the economic impact of the measures on the fishing activities concerned.

This management plan includes limitations on fishing effort in terms of days at sea. In particular, specific attention is given to the possibility of establishing a system that regulates the removal of biomass from the sea according to market needs, since it has been found that the product offer often occurs in an uncoordinated and discontinuous way with consequent waste of biological and financial resources. This objective requires the introduction of specific management rules as the establishment of a coordination Producer Organizations (POs) who takes responsibility for the definition and compliance with the rules relating to fishing, in particular as regards fishing times and the quantities of catches allowed to vessels of the entire purse seine and pelagic pair trawl fleets. Below is a description of the individual management measures.

Fishing capacity adjustment plan

A limited number of boats will be established year after year (through the fishing permits described below) to fish for small pelagics in the Sicilian territorial sea, based primarily on boats registered in the Sicilian maritime compartments. This number may vary only from year to year based on the results of the scientific monitoring and the market situation of the product.

With reference to the state of biological resources and on the basis of estimates of biological parameters, the objectives of the Adjustment Plan will be pursued through a disarmament plan which provides for the overall reduction of 3% of the fishing capacity registered in the Sicilian compartments and authorized for purse seine. The consolidated procedures underlying the implementation of the definitive stop measure provide for the documentary verification, certified by the port authority, that the boat has been fishing in the previous two years. Each decommissioning plan will be implemented within two years of its approval, as required by EU regulations.

Reduction of fishing activity

Given the target of 15% in terms of reduction of fishing effort, it is necessary that the reduction of activities stands at 12%. This implies a reduction in fishing days from 20 to 18 days per month. Purse seine fishing must take place between 15 March and 15 November, without prejudice to further restrictive provisions which may

be adopted by the coordinating body, considering that some trawls are in possession of a temporary authorization for use. In the absence of specific information on the impact of fishing with pelagic pair trawl and considering that juvenile anchovies are vulnerable to trawlers in the period in autumn and winter, fishing with pelagic pair trawl is prohibited from October to March inclusive. Temporary fishing with pelagic pair trawl is allowed from Monday to Friday inclusive, for no more than 4 days a week.

Catch management

In order to guarantee control between supply and demand and in order to reduce fishing pressure in case of low market demand, catch limits are foreseen per boat regardless of the tonnage. In the case of armed purse seine vessels, the catch limit is set at 6,000 boxes of anchovies per month per individual vessel. For boats operating in GSA 16 with provisional permit to use pelagic pair trawl the maximum catch is set in 300 wooden boxes, per fishing day and per couple. At the aforementioned limits it will be possible to add fish quotas in the case of productions destined for the processing industry to be established day by day according to the demand and subject to authorization by the coordination body. These rules are valid for the first fishing season and may be subject to change at the beginning of the following fishing season if the coordinating body deems it appropriate.

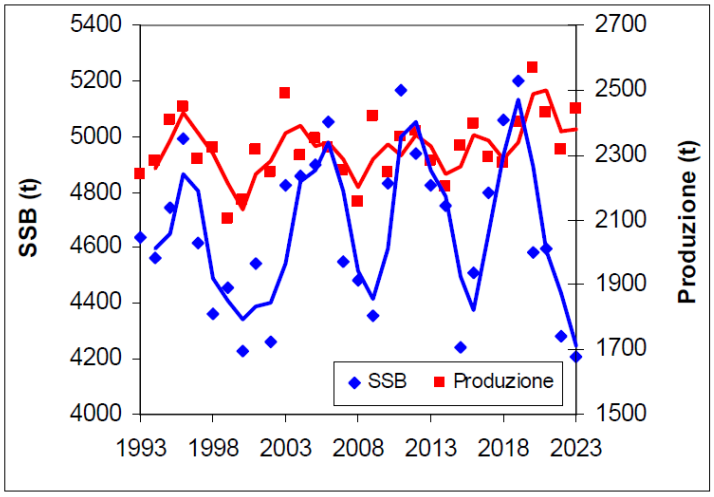
Minimum sizes on landing

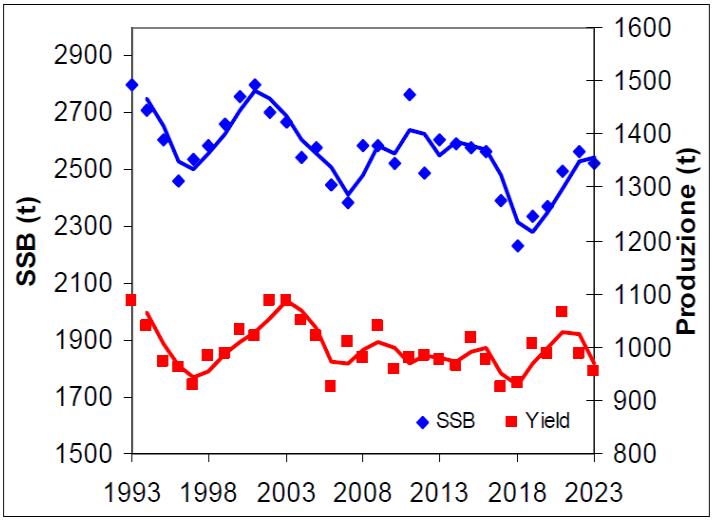
As regards the minimum sizes, reference is made to the legislation in force at European (Reg. EC N. 1967/2006) and national (law 14 July 1965, n. 963 and subsequent amendments, decree of the President of the Republic of 2 October 1968, n.1639 and subsequent modifications). Specifically, the minimum size for anchovy is 9 cm LT and that of Sardine is 11 cm LT. The measure referred to the minimum landing sizes in small pelagic fishing must be combined with other technical measures, such as compliance with the closure of 3 nautical miles from the coast, in order to prevent fishing in the areas where the juveniles concentrate.

The plan also provides in its annexes simulations of the measures employed. The analysis of the current state of exploitation was carried out by means of a cohort analysis (Jones, 1982) on the length structure of the commercial landings sampled over the two years 2006-2007 through the Vit package (Lleonart and Salat, 2000). The values that identify the current state with a fishing mortality value F = 0.62 and a recruitment of 800 million young anchovies of 8.5 cm in total length were used to simulate the variation in production and total biomass and spawners (SSB) through the Yield package (Branch et al., 2000) as fishing effort changes, expressed in terms of fishing mortality.

In the simulations, an uncertainty in the input parameters of 20% was considered. In the absence of information on the adult-recruits relationship the simulations have been carried out for randomly variable recruitments within 10% of the input value. The simulations have been made for three different recruiting scenarios. The three recruiting scenarios are: a) one recruitment situation that reflects the recruitment estimate in 2006-2007 (800 millions of recruits); b) a situation of recruitment halved; and c) a situation of recruitment doubled. 100 simulations were carried out in each analysis. The values shown refer to the medians of the 100 simulations. Fishing effort levels (in the model represented by variations in F fishing mortality) simulated were: a) unchanged effort (F x 1); b) a 15% reduction (F x 0.85). The evolution of production and SSB in the three different recruiting scenarios and by values fishing mortality constants (F = 0.62) are shown in **Error! Reference source not found.**. The evolution of production and renewal capacity (SSB) of the anchovy stock reducing fishing mortality by 15% in the various recruiting scenarios is shown in Figure 3. In the intermediate recruitment scenario, the mortality reduction in randomly variable fishing produces in the medium-long time a loss of 6% of the production while the SSB trend simulation does not show significant changes. A similar result is produced in the simulation for the low level of recruitment. In the case of high recruitment, however, no reduction in production is expected while an SSB increase of approximately 7% of the current value is expected.



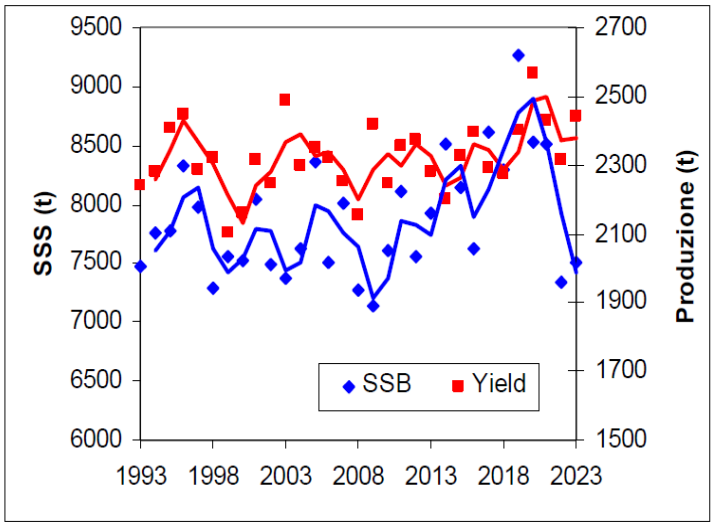




**Figure 2 -** Evolution of the production and SSB of anchovy in GSA 16. Simulation with R = 800 (upper graph); R = 400 (middle graph); R = 1200 (upper graph) current F equal to 0.62.

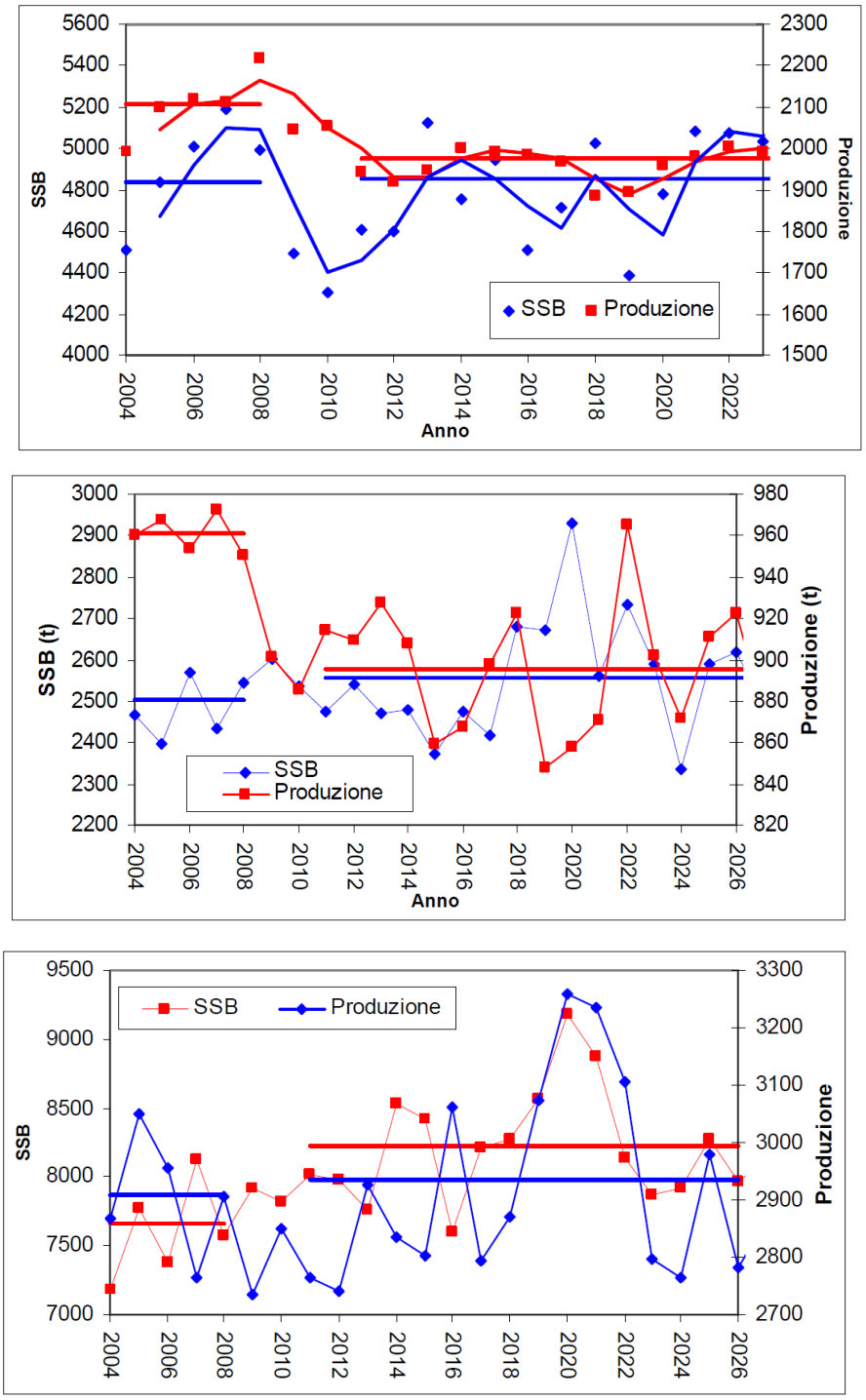



**Figure 3 -** Evolution of the production and SSB of anchovy in GSA 16. Simulation with R = 800 (upper graph); R = 400 (middle graph); R = 1200 (lower graph)and F = 0.62 from 2004 to 2008, followed by a reduction in F of 7.5% in 2009 (F = 0.57) and a further reduction of 7.5% in 2010 (F = 0.53).

#### 7.4.1.4.2 Discard plan for small pelagic fleets operating in GSA 16

The CFP seeks to phase in the implementation of the landing obligation from 2015 through to 2019 for all commercial fisheries (species under TACs, or under minimum sizes) in European waters and for European vessels fishing in the high seas. This gradual approach is to support the fishing industry in its adaptation to significant changes in fisheries management and practices (e.g. from a system recording only the landed fraction of the catch to a system recording the entire catch). The landing obligation requires all catches of

regulated commercial species on-board to be landed and counted against quota. These are species under TAC (Total Allowance Catch, and so called quotas) or, in the Mediterranean, species which have a MLS (minimum landing size such as mackerel which is regulated by quotas; and gilt-head sea-bream regulated by size). Undersized fish cannot be marketed for direct human consumption purposes whilst prohibited species (e.g. basking shark) cannot be retained on board and must be returned to the sea. The discarding of prohibited species should be recorded in the logbook and forms an important part of the science base for the monitoring of these species. From 2015 to 2019, the landing obligation was phased in across fisheries and species. By 2019 all species subject to TAC limits and Minimum Conservation Reference Sizes in the Mediterranean are subject to the landing obligation. The phasing in provisions as well as a number of exemptions are based on Joint recommendations from regional groups of member states. Following evaluation by the STECF, and provided that the assessment is positive, the joint recommendations are transformed into temporary discard plans by means of delegated act. The plans detail the species covered, provisions on catch documentation, minimum conservation reference sizes, and exemptions (for fish that may survive after returning them to the sea, and a specific de minimis discard allowance under certain conditions). The plans have a maximum duration of 3 years and eventually the provisions of the landing obligation will eventually become incorporated into Multi Annual Plans. Since October 2014 the Commission has adopted several discard plans (through so-called delegated acts) in preparation of the implementation of the landing obligation. In the case of the discard plan for certain small pelagic fisheries in the Mediterranean Sea, which consider also the small pelagic fleets operating in GSA 16, the Commission Delegated Regulation (EU) No 1392/2014 of 20 October 2014 is no longer in force since the end of 2017. Therefore, undersized catches must be landed and can be sold, but not for direct human consumption. Producer organisations have among their tasks the duty to help their members find adequate outlets for these catches, without promoting the creation of a market for undersized fish. On the other hand, Member States also have the obligation to assist fishermen by facilitating storage of undersize fish and finding possible outlets. Once landed, the undersized fish has to be handled in line with ABP (animal by-products) rules and processors must be able to distinguish these catches from fish destined for direct human consumption.

#### 7.4.1.5 Acoustic surveys in GSA 16

Since 1998 the IAMC-CNR (now CNR-IAS) has been collecting acoustic data for evaluating abundance and distribution pattern of small pelagic fish species (mainly anchovy and sardine) in the Strait of Sicily (GSA 16). Before or after acoustic data collection a standard procedure for calibrating the three transducers was carried out by adopting the standard sphere method (Johannesson & Mitson, 1983).

Acoustic sampling is performed during day time by means of scientific split-beam echosounders working at 38 kHz and calibrated following standard techniques. Acoustic data were recorded in GSA 16 following a regular sampling design (parallel transects, ) at a constant speed of 8–10 nmi/h (Figure 4).

Biological data were collected by a pelagic trawl net with the following characteristics: total length 78 m, horizontal mouth opening 13-15 m, vertical mouth opening 6-8 m, mesh size in the cod-end 10 mm. The net was equipped with two doors with weight 340 kg. During each trawl the monitoring system SIMRAD ITI equipped with trawl-eye and temp-depth sensors was adopted.

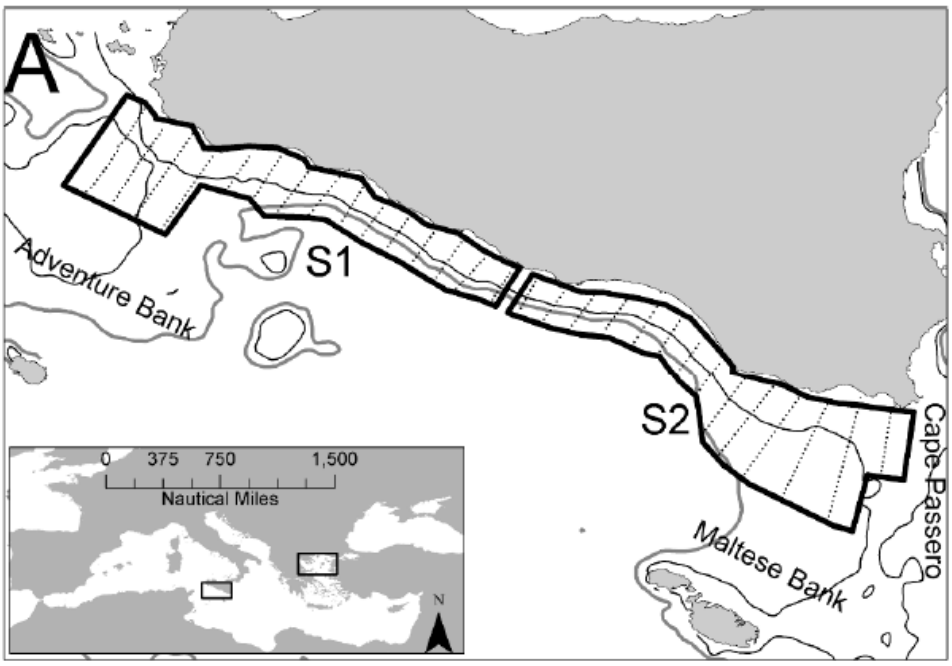



**Figure 4 -** Study areas and sampling design of the acoustic survey in the Strait of Sicily. Source: modified from Barra et al., 2015.

Annual maps of anchovy density recorded from acustic survey are presented in Figure 5, where the study area of the Strait of Sicily was divided into two distinct sectors (S1 and S2 corresponding to Adventure and Maltese Bank respectively), separated by the dashed line.

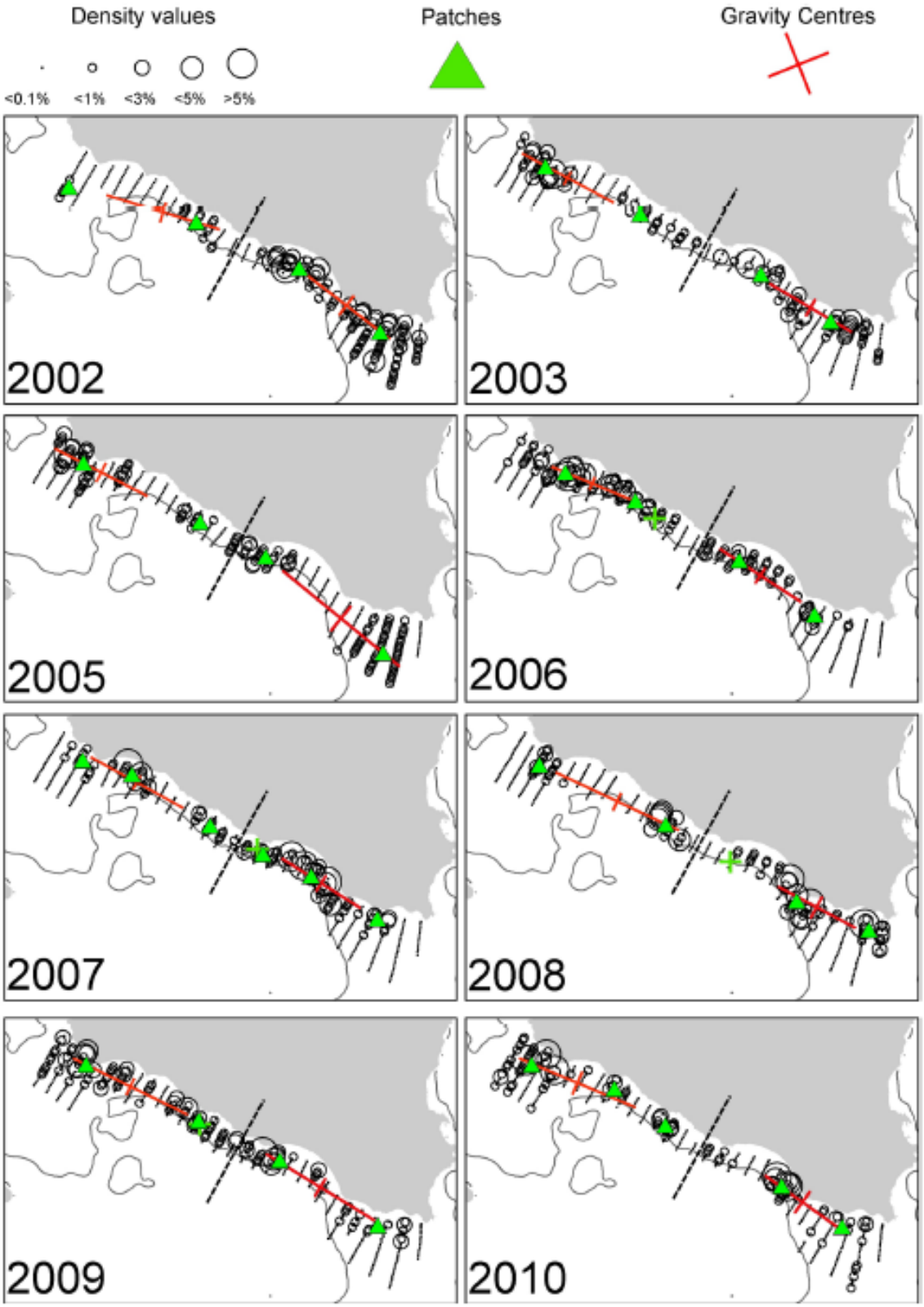



**Figure 5 -** Annual maps of anchovy density distribution in the Strait of Sicily during summertime. The position of the centres of gravity and the main spatial patches (contributing > 10% to abundance) are shown. The 200 m isobath is indicated by a continuous line. Source: modified from Barra et al., 2015

#### 7.4.1.6 Stock status of European anchovy in GSA 16

The last evaluation of European anchovy in the GSA 16 have been attempted in the framework of FAO-GFCM working group of small pelagics species (GFCM, 2019). Anchovy in GSA 16 are mainly targeted by purse seine (PS) and pelagic pair trawls (Figure 6). The average landings in GSA16 during the period 2008-2018 was ~3000 tonnes. In particular, landing values drops from ~5000 tonnes in 2008 to ~1150 tonnes in 2013. Landing values then start increasing up to ~3000 tonnes in 2018. Acoustic estimates, showed big oscillation in the period 2002-2009 and a decreasing pattern in the period 2010-2018 (Figure 7). Fishery independent information is also presented in Figure 8, which displays the estimated trend in anchovy total biomass in the period 1998-2014.

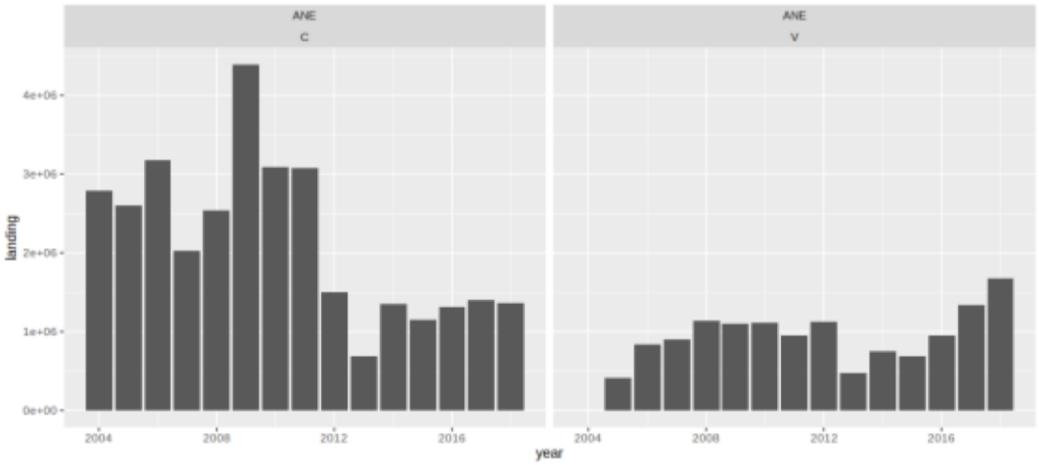



**Figure 6 -** Landings of anchovy (kg) in GSA16 (PS left panel, PTM right panel). Source: GFCM, 2019.

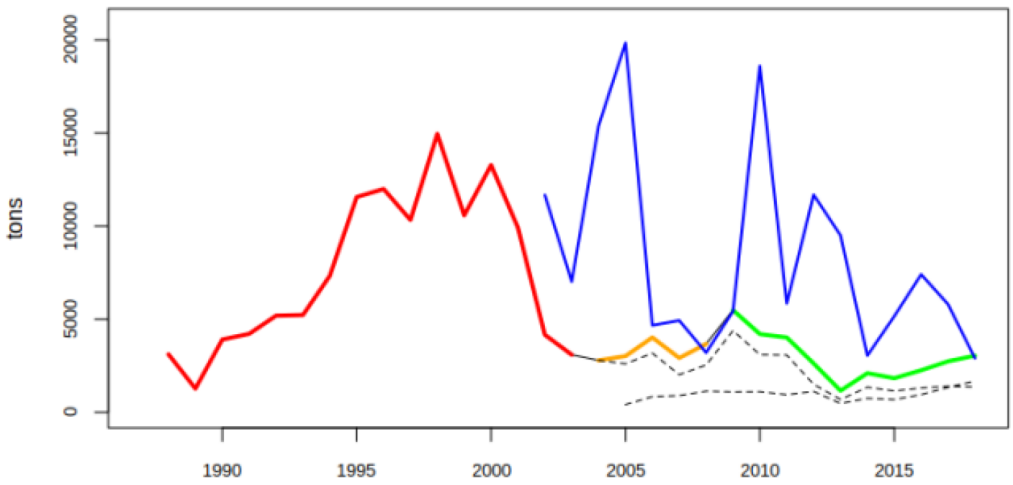



**Figure 7 -** Trends in landings (green: age readings available; orange: age readings not available; red: only information on total landings are available) and acoustic biomass estimates (blue line). Dashed lines represent landings from PTS and PS. Source: GFCM, 2019.

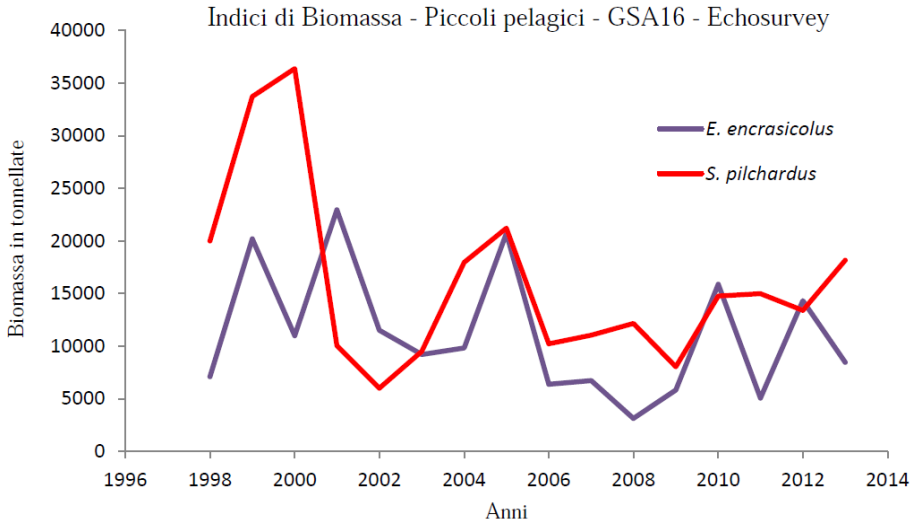



**Figure 8 -** Trend in anchovy and sardine total biomass (estimated by acoustics) for GSA 16 in the period 1998-2014. Source: Mannini and Sabatella (2015).

For assessment purposes different models were used; two age-based (namely XSA and a4a) and a production model (SpiCT). The two age-based models provided a contradictory signal in terms of the status of the stock. Similarly to the previous assessment, very high SSB values (~10^6 tonnes) were obtained by using XSA. Using data from 2012 - 2018 the SSB provided by XSA seems more realistic. On the contrary, by using a4a, the SSB values were very low, thus leading to very high f values. The two models lead to very different results in terms of SSB and Fbar and were considered unreliable by the WG. The SPiCT showed convergence but increased CIs and high sensitivity in terms of the use of priors.

The WG suggested to keep the assessment as preliminary. For the future workplan it was suggested to re-evaluate the acoustic survey index to take into account possible population distribution/migration over the north part of Sicily, re-evaluate the time series of the catches regarding the possible inclusion of landings outside GSA16 in the current time-series. SPiCT might be improved if applied in shorter time steps e.g. semester, quarter basis.

Taking into account the lack of a reliable evaluation of the stock status in respect to any reference point, the RBF approach is going to be employed in accordance with Table 3 of FCR v2.0 SA7.7.6.

#### 7.4.1.7 European anchovy in GSA 16 as a key Lower Trophic Level (LTL) stock

Anchovy is treated as a default key low trophic level species (see FCR v2.0 SA2.2.9, Box SA1) unless evidence is available to show it is not. The assessment team has considered whether the European anchovy stock in GSA 16 stock is not a “key low trophic level species” (key LTL) under the definitions in the MSC requirements and guidance (FCR v2.0 SA2.2.9).

A holistic food web model (quantitative Ecopath with Ecosim model; Agnetta et al., 2019) has been developed in the Strait of Sicily in order to understand the interplay between the benthic-pelagic coupling (BTC) and mixed fisheries in a Mediterranean system.

The reconstruction of the food web required review and integration of a vast set of local and regional biological information from bacteria to large pelagic species that were aggregated into 72 functional groups. Fisheries were described by 18 fleet segments resulting from combination of fishing gears and fishing vessel size.

According to the model outputs, the bulk of consumption fluxes (~95%, 1500 t km-2 years-1) was exchanged by lower “taxonomic” groups (i.e. macro-benthos, zooplankton, euphausiids and bacteria) across the benthic

and pelagic domains. The remaining consumption flux (~ 5%) was determined by all other functional groups, with epipelagic fish (EPI) and mesopelagic fish crustacean feeders (MSC) having the most relevant flows for benthic-pelagic coupling both as consumers and sources. Many other FGs (e.g., horse mackerel *Trachurus* spp., TRA and sardine, SAR), contributed to a less extent to the consumption fluxes linked to BPC although they had high biomass and were predators and preys across benthic and pelagic domains as well.

In evaluating whether a stock under assessment represents a key LTL stock for the purposes of MSC assessment the Assessment Team is required to consider the trophic position of target stocks to ensure precaution in relation to their ecological role, in particular for species low in the food chain (MSC FCR v2.0 SA2.2.8). The Assessment Team is required to treat a stock under assessment against Principle 1 as a key LTL stock if it is one of the species types listed in Box SA1 and in its adult life cycle phase the stock holds a key role in the ecosystem, such that it meets at least two of the following sub-criteria i, ii and iii:

i. A large proportion of the trophic connections in the ecosystem involve this stock, leading to significant predator dependency;
ii. A large volume of energy passing between lower and higher trophic levels passes through this stock;
iii. There are few other species at this trophic level through which energy can be transmitted from lower to higher trophic levels, such that a high proportion of the total energy passing between lower and higher trophic levels passes through this stock (i.e., the ecosystem is 'wasp-waisted').

Guidance to calculate metrics for key LTL species are provided in MSC 2.0 and are as follows:

***Key LTL criterion i – Connectance***

Connectance criteria require that the LTL stock is eaten by the majority of predators, as stated: "a large proportion of the trophic connections in the ecosystem involve this species, leading to significant predator dependency. The team used the Proportional Connectance (PC) index and weighted SURF index (SUpportive Role to Fishery ecosystems).

PC is calculated as follows:

from a diet matrix that has n components, and only requires a knowledge of the interaction between groups, not the proportional diet fraction of each group.

- The total connectance T in a diet matrix is the Number of all positive (non-zero) diet interactions between components (i.e., predator-prey).
- The connectance C of a component is the total number of prey interactions plus the total number of predator interactions of that component calculated from the diet matrix.
- Then the proportional connectance of prey i is $PCi=Ci/T$

SURF is calculated as follows:

$$SURF_i = \frac{\sum_{j=1}^{n} (p_{j,i})^2}{T}$$

where pij is the diet fraction of predator j on prey i (the proportion of the diet of predator j that is made up of prey i) and T. The total connectance T in a diet matrix is the Number of all positive (non-zero) diet interactions between components (i.e., predator-prey). SURF values of less than 0.001 will normally indicate a non-key LTL stock. SURF values of greater than 0.005 will normally indicate a key-LTL stock. SURF has the advantage that it is relatively insensitive to the grouping of predator and prey species; connectance is highly sensitive to them.

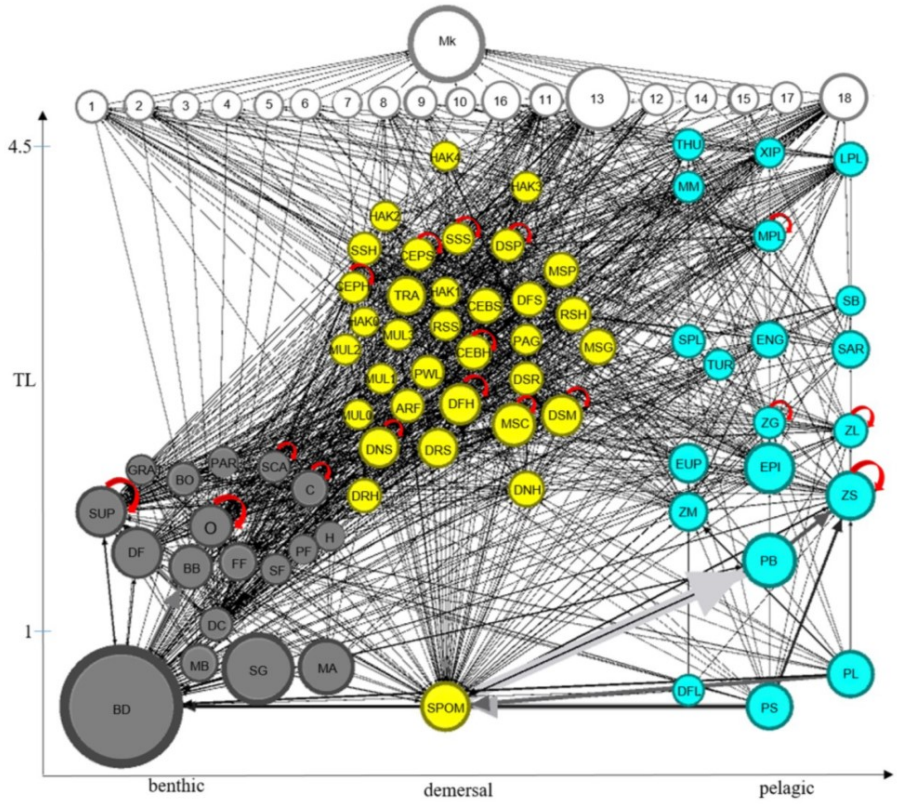



**Figure 9 -** Flow diagram of the food web. Functional groups (nodes) by trophic levels (TL, y-axis) and by benthic (grey), demersal (yellow) and pelagic (cyan) domains (x-axis). White nodes represent fishing activities and the market (Mk). Links width are proportional to flow intensity, i.e., to annual food consumption rates for FG (>5^-6 t km−2 year−1), to catches for fleets and to landings for the market. Node radius is proportional to the square root of FG biomass, total catch of fleets and total landings for the market. Grey arrows indicate higher fluxes. Red arrows are loops (cannibalism). European anchovy = ENG Source: Agnetta et al., 2019.

***Key LTL criterion ii – Energy Transfer***

This sub-criterion requires that "a large volume of energy passing between lower and higher trophic levels passes through this stock"; Argument to determine whether is triggered may be based on 1) empirical data, 2) credible quantitative models, and/or 3) information about the relative abundance of the LTL stock in the ecosystem. Where consumer biomass ratio is calculated as the biomass of the candidate key LTL stock, divided by the biomass of all consumers in the ecosystem (i.e., all ecosystem components that are not primary producers or detritus), i.e., Consumer Biomass Ratio = BLTL/Bconsumers; and model-based results suggest that any LTL stock that constitutes more than 5% of the consumer biomass in the ecosystem should be regarded as a key LTL stock.

***Key LTL criterion iii – Wasp-waisted-ness***

The 'wasp-waisted-ness' sub-criterion requires that "there are few other species at this trophic level through which energy can be transmitted from lower to higher trophic levels, such that a high proportion of the total energy passing between lower and higher trophic levels passes through this stock".

Where: simple food webs will be sufficient to determine whether there are significant other functionally similar species (at a similar trophic level) to the candidate LTL stock; although for the candidate LTL species, the focus is on the adult component of the stock (SA2.2.9.a, SA2.2.9b), the consideration of other species at the same trophic level should consider all life stages (including juveniles) of those species.

***i) A large proportion of the trophic connections in the ecosystem involve this stock, leading to significant predator dependency.***

There is enough information available in order to estimate a connectivity index (proportional connectance) and SURF of the stock.

Proportional Connectance (PC) and SUpportive Role to Fishery ecosystems (SURF):

From model:

T= 855, Ci= 12, PCi = 12/855 = 1.4% for adult life stage.

SURF= 0.0002

The PC index calculated for the European anchovy is 1.4%. This would indicate that the stock is a non-key LTL (according to GSA2.2.9 MSC Certification Requirements Guidance V2.0 the threshold for Key LTL is PC >8%).

The weighted SURF index (SUpportive Role to Fishery ecosystems) based on EwE model was calculated as well to investigate if stock in question is kLTL. SURF for adult life stage of European anchovy stock is 0.0002, which is below threshold for key LTL species (0.001).

**Conclusion for key LTL criterion i – Connectance: not a key LTL stock.**

***ii) A large volume of energy passing between lower and higher trophic levels passes through this stock.***

Model-based results suggest that European anchovy constitutes less than 5% of the consumer biomass in the ecosystem. The GSA2.2.9 MSC Certification Requirements Guidance V2.0 give that threshold for Key LTL stocks is “more than 5%”. Stock should be regarded as a key LTL stock.

**Conclusion for key LTL criterion ii – Energy Transfer: not a key LTL stock.**

***iii) There are few other species at this trophic level through which energy can be transmitted from lower to higher trophic levels, such that a high proportion of the total energy passing between lower and higher trophic levels passes through this stock (i.e. the ecosystem is ‘wasp waisted’)***

Based on model results we found that there are several other species/functional groups (25) at trophic level like European anchovy (between TL 3 and TL4) through which energy can be transmitted from lower to higher trophic levels (Table 9). Quantified trophic flows constitute small fraction of energy of all flows in the food-web, which indicate non-wasp-waistedness of European anchovy stock in the Strait of Sicily waters ecosystem.

**Table 9 -** Input parameters and main outputs (in bold) of the food web model. For each functional group (FG) are detailed inputs: biomass (B; t km−2), production/biomass ratio (P/B; yr−1), consumption/biomass ratio (Q/B; yr−1); Landing and Discards are expressed in t km−2 year−1. Outputs: trophic level (TL), ecotrophic efficiency (EE; for most of the FG except for BO, EUP, MB), production/consumption (P/Q), respiration/assimilation (R/A), omnivory index (OI). Dom = Domain: p = pelagic, d = demersal, b = benthic, European anchovy = ENG. Source: Agnetta et al., 2019.

| N° | Dom | FG | TL | B ($tkm^{-2}$) | P/B($year^{-1}$) | Q/B($year^{-1}$) | EE | P/Q | R/A | Landings | Discards | OI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | p | SB | **3.58** | 2.8E-05 | 4.48 | 79.17 | **0.000** | **0.057** | **0.929** | 0.0E+00 | 0.0E+00 | **0.87** |
| 2 | p | MM | **4.35** | 3.7E-02 | 0.06 | 11.48 | **0.000** | **0.005** | **0.993** | 0.0E+00 | 0.0E+00 | **0.32** |
| 3 | p | TUR | **3.25** | 2.5E-02 | 0.16 | 2.60 | **0.000** | **0.062** | **0.923** | 0.0E+00 | 0.0E+00 | **0.29** |
| 4 | p | XIP | **4.51** | 5.9E-03 | 0.62 | 5.00 | **0.318** | **0.125** | **0.844** | 2.4E-02 | 1.8E-03 | **0.15** |
| 5 | p | THU | **4.56** | 4.9E-02 | 0.52 | 5.00 | **0.432** | **0.104** | **0.870** | 1.1E-02 | 3.4E-04 | **1.91** |
| 6 | p | LPL | **4.47** | 2.4E-01 | 0.40 | 5.00 | **0.262** | **0.080** | **0.900** | 2.4E-02 | 1.5E-03 | **0.10** |
| 7 | p | MPL | **4.02** | 6.4E-02 | 1.29 | 7.46 | **0.498** | **0.174** | **0.783** | 7.4E-03 | 8.5E-05 | **0.20** |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8 | p | SPL | **3.37** | 1.6E-01 | 1.29 | 6.76 | **0.982** | **0.191** | **0.761** | 5.1E-03 | 3.7E-05 | **0.09** |
| 9 | d | HAK0 | **3.48** | 1.1E-03 | 5.00 | 70.49 | **0.237** | **0.071** | **0.91** | 0.0E+00 | 0.0E+00 | **0.02** |
| 10 | d | HAK1 | **3.62** | 4.1E-03 | 3.00 | 30.25 | **0.509** | **0.099** | **0.88** | 2.3E-04 | 3.1E-05 | **0.02** |
| 11 | d | HAK2 | **4.08** | 1.4E-02 | 1.43 | 15.37 | **0.916** | **0.093** | **0.88** | 7.0E-04 | 2.3E-05 | **0.18** |
| 12 | d | HAK3 | **4.31** | 2.2E-02 | 1.56 | 8.61 | **0.915** | **0.181** | **0.77** | 2.1E-02 | 6.9E-04 | **0.13** |
| 13 | d | HAK4 | **4.49** | 2.1E-03 | 1.01 | 4.67 | **0.972** | **0.216** | **0.73** | 1.9E-03 | 6.2E-05 | **0.06** |
| 14 | d | MUL0 | **2.90** | 2.6E-03 | 5.00 | 38.99 | **0.522** | **0.128** | **0.84** | 0.0E+00 | 0.0E+00 | **0.39** |
| 15 | d | MUL1 | **2.90** | 1.4E-02 | 3.20 | 15.41 | **0.656** | **0.252** | **0.69** | 0.0E+00 | 0.0E+00 | **0.37** |
| 16 | d | MUL2 | **3.30** | 4.0E-02 | 1.50 | 7.00 | **0.620** | **0.214** | **0.73** | 4.9E-03 | 2.2E-04 | **0.04** |
| 17 | d | MUL3 | **3.36** | 2.0E-02 | 2.10 | 4.32 | **0.677** | **0.426** | **0.47** | 1.0E-02 | 4.4E-04 | **0.10** |
| 18 | d | TRA | **3.56** | 8.2E-01 | 1.20 | 3.62 | **0.869** | **0.332** | **0.59** | 1.2E-02 | 5.2E-03 | **0.43** |
| 19 | d | PAG | **3.39** | 2.4E-02 | 0.90 | 4.50 | **0.523** | **0.200** | **0.75** | 7.4E-03 | 4.7E-05 | **0.27** |
| 20 | d | DFS | **3.61** | 3.0E-01 | 1.14 | 3.60 | **0.975** | **0.317** | **0.6** | 7.5E-03 | 8.5E-04 | **0.50** |
| 21 | d | DFH | **2.93** | 1.3E+00 | 1.82 | 8.03 | **0.948** | **0.227** | **0.72** | 7.0E-03 | 1.5E-03 | **0.54** |
| 22 | d | DSM | **2.89** | 1.4E+00 | 1.22 | 4.72 | **0.955** | **0.258** | **0.68** | 3.7E-02 | 1.7E-03 | **0.49** |
| 23 | d | DSP | **3.93** | 1.3E-01 | 0.75 | 3.25 | **0.544** | **0.230** | **0.71** | 8.4E-03 | 6.6E-04 | **0.40** |
| 24 | d | DSR | **3.13** | 2.0E-01 | 1.11 | 4.93 | **0.585** | **0.225** | **0.72** | 1.1E-02 | 1.2E-03 | **0.43** |
| 25 | d | MSC | **2.88** | 1.9E+00 | 2.39 | 10.21 | **0.659** | **0.234** | **0.71** | 0.0E+00 | 0.0E+00 | **0.43** |
| 26 | d | MSG | **3.31** | 4.8E-01 | 0.99 | 4.50 | **0.358** | **0.220** | **0.73** | 0.0E+00 | 0.0E+00 | **0.47** |
| 27 | d | MSP | **3.79** | 3.3E-01 | 1.00 | 4.33 | **0.860** | **0.231** | **0.71** | 0.0E+00 | 0.0E+00 | **0.04** |
| 28 | d | RSH | **3.51** | 3.1E-01 | 0.65 | 2.60 | **0.014** | **0.248** | **0.69** | 2.3E-03 | 6.8E-05 | **0.33** |
| 29 | d | RSS | **3.42** | 2.3E-02 | 0.49 | 2.91 | **0.076** | **0.169** | **0.79** | 8.1E-04 | 3.3E-05 | **0.16** |
| 30 | d | SSH | **3.92** | 1.6E-01 | 0.72 | 3.39 | **0.154** | **0.212** | **0.73** | 8.9E-04 | 2.3E-04 | **0.24** |
| 31 | d | SSS | **3.97** | 6.9E-02 | 1.02 | 4.61 | **0.434** | **0.222** | **0.72** | 6.0E-04 | 2.0E-05 | **0.36** |
| 32 | p | ENG | **3.36** | 5.6E-01 | 1.90 | 13.50 | **0.598** | **0.140** | **0.82** | 5.0E-02 | 3.8E-03 | **0.08** |
| 33 | p | SAR | **3.30** | 6.6E-01 | 1.00 | 8.40 | **0.557** | **0.119** | **0.85** | 2.1E-02 | 8.6E-04 | **0.06** |
| 34 | p | EPI | **2.58** | 4.5E+00 | 1.70 | 7.20 | **0.444** | **0.236** | **0.7** | 7.5E-03 | 3.3E-04 | **0.48** |
| 35 | d | CEBH | **3.25** | 3.2E-01 | 2.53 | 12.27 | **0.602** | **0.207** | **0.74** | 3.8E-02 | 9.6E-04 | **0.28** |
| 36 | d | CEBS | **3.55** | 3.5E-01 | 3.13 | 12.25 | **0.238** | **0.255** | **0.68** | 0.0E+00 | 0.0E+00 | **0.14** |
| 37 | d | CEPH | **3.63** | 4.2E-02 | 8.74 | 24.88 | **0.917** | **0.351** | **0.56** | 4.1E-03 | 3.9E-05 | **0.51** |
| 38 | d | CEPS | **3.91** | 1.3E-01 | 4.20 | 13.06 | **0.781** | **0.322** | **0.6** | 7.7E-03 | 7.6E-05 | **0.45** |
| 39 | d | DNS | **2.81** | 1.2E+00 | 3.37 | 12.54 | **0.690** | **0.269** | **0.66** | 1.6E-03 | 1.1E-05 | **0.64** |
| 40 | d | DNH | **2.44** | 4.6E-01 | 2.26 | 11.67 | **0.999** | **0.194** | **0.76** | 1.5E-04 | 1.0E-06 | **0.40** |
| 41 | d | DRS | **2.78** | 1.0E+00 | 1.62 | 7.40 | **0.889** | **0.219** | **0.73** | 5.4E-03 | 3.6E-05 | **0.53** |
| 42 | d | DRH | **2.44** | 2.5E-01 | 1.72 | 8.72 | **0.814** | **0.191** | **0.76** | 3.6E-03 | 2.6E-04 | **0.36** |
| 43 | d | ARF | **3.09** | 1.6E-01 | 1.30 | 7.32 | **0.180** | **0.178** | **0.78** | 1.4E-02 | 2.5E-03 | **0.29** |
| 44 | d | PWL | **3.31** | 1.5E-01 | 1.34 | 8.00 | **0.822** | **0.168** | **0.79** | 1.1E-01 | 1.9E-02 | **0.17** |
| 45 | b | SUP | **2.31** | 4.3E+00 | 7.73 | 36.51 | **0.800** | **0.212** | **0.74** | 1.1E-03 | 2.9E-02 | **0.23** |
| 46 | b | O | **2.22** | 1.8E+00 | 4.92 | 19.61 | **0.798** | **0.251** | **0.69** | 9.3E-04 | 1.0E-01 | **0.20** |
| 47 | b | FF | **2.00** | 7.4E-01 | 4.44 | 18.15 | **0.797** | **0.245** | **0.69** | 0.0E+00 | 5.6E-02 | **0.00** |
| 48 | b | DF | **2.05** | 4.6E+00 | 2.88 | 10.60 | **0.733** | **0.272** | **0.66** | 0.0E+00 | 4.3E-03 | **0.05** |
| 49 | b | C | **2.51** | 5.7E-01 | 6.11 | 17.44 | **0.901** | **0.350** | **0.56** | 0.0E+00 | 5.4E-04 | **0.30** |
| 50 | b | PAR | **2.65** | 1.3E-02 | 8.00 | 30.99 | **0.876** | **0.258** | **0.68** | 0.0E+00 | 0.0E+00 | **0.34** |
| 51 | b | SCA | **2.57** | 6.3E-02 | 6.50 | 31.04 | **0.918** | **0.209** | **0.74** | 0.0E+00 | 3.2E-05 | **0.34** |
| 52 | b | H | **2.13** | 1.4E-03 | 5.08 | 24.20 | **0.679** | **0.210** | **0.74** | 0.0E+00 | 0.0E+00 | **0.11** |
| 53 | b | GRA | **2.57** | 7.0E-03 | 8.44 | 39.99 | **0.966** | **0.211** | **0.74** | 0.0E+00 | 9.3E-03 | **0.34** |
| 54 | b | SF | **2.00** | 3.5E-02 | 6.35 | 30.48 | **0.345** | **0.208** | **0.74** | 0.0E+00 | 4.2E-03 | **0.00** |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 55 | b | PF | **2.00** | 7.3E-04 | 3.03 | 11.31 | **0.938** | **0.268** | **0.66** | 0.0E+00 | 5.6E-04 | **0.00** |
| 56 | b | BO | **2.52** | **2.1E-01** | 9.00 | 33.00 | 0.950 | **0.273** | **0.66** | 0.0E+00 | 0.0E+00 | **0.28** |
| 57 | p | EUP | **2.59** | **1.0E+00** | 6.00 | 30.00 | 0.950 | **0.200** | **0.75** | 0.0E+00 | 0.0E+00 | **0.52** |
| 58 | p | ZG | **2.84** | 8.5E-02 | 18.45 | 48.80 | **0.974** | **0.378** | **0.53** | 0.0E+00 | 4.7E-05 | **0.58** |
| 59 | p | ZL | **2.77** | 2.4E-01 | 30.00 | 102.00 | **0.883** | **0.294** | **0.63** | 0.0E+00 | 0.0E+00 | **0.51** |
| 60 | p | ZM | **2.26** | 8.7E-01 | 28.55 | 107.46 | **0.773** | **0.266** | **0.61** | 0.0E+00 | 0.0E+00 | **0.30** |
| 61 | p | ZS | **2.53** | 3.7E+00 | 15.63 | 80.73 | **0.799** | **0.194** | **0.71** | 0.0E+00 | 0.0E+00 | **0.28** |
| 62 | p | PB | **2.00** | 6.0E+00 | 25.87 | 89.78 | **0.983** | **0.288** | **0.66** | 0.0E+00 | 0.0E+00 | |
| 63 | b | BB | **2.00** | 2.1E+00 | 25.87 | 89.78 | **0.976** | **0.288** | **0.66** | 0.0E+00 | 0.0E+00 | |
| 64 | p | PS | **1.00** | 2.9E+00 | 205.62 | 0.00 | **0.209** | | | 0.0E+00 | 0.0E+00 | |
| 65 | p | DFL | **1.00** | 4.8E-02 | 220.08 | 0.00 | **0.990** | | | 0.0E+00 | 0.0E+00 | |
| 66 | p | PL | **1.00** | 3.0E+00 | 131.49 | 0.00 | **0.259** | | | 0.0E+00 | 0.0E+00 | |
| 67 | b | MB | **1.00** | **7.4E-01** | 30.00 | 0.00 | 0.900 | | | 0.0E+00 | 0.0E+00 | |
| 68 | b | SG | **1.00** | 1.8E+01 | 5.47 | 0.00 | **0.091** | | | 0.0E+00 | 0.0E+00 | |
| 69 | b | MA | **1.00** | 6.9E+00 | 5.00 | 0.00 | **0.401** | | | 0.0E+00 | 0.0E+00 | |
| 70 | b | DC | **1.00** | 1.9E-01 | | | **0.876** | | | 0.0E+00 | 0.0E+00 | |
| 71 | d | SPOM | **1.00** | 3.9E+00 | | | **0.995** | | | 0.0E+00 | 0.0E+00 | |
| 72 | b | BD | **1.00** | 8.4E+01 | | | **1.000** | | | 0.0E+00 | 0.0E+00 | |

**Conclusion for key LTL criterion iii – Wasp waisted-ness: not a key LTL stock.**

The conclusion is that this stock meets 0 of the 3 criteria set by the MSC to define key LTL species (FCR v2.0, SA2.2.9a). This does not meet the threshold for consideration as a key LTL species which requires that at least two of the criteria should be met for the adult life cycle stage. Accordingly, European anchovy stock in the Strait of Sicily is not treated as a key LTL species.

## Principle 1 references


Agnetta D, Badalamenti F, Colloca F, D'Anna G, Di Lorenzo M, Fiorentino F, et al. (2019) Benthic-pelagic coupling mediates interactions in Mediterranean mixed fisheries: An ecosystem modeling approach. PLoS ONE 14(1): e0210659. https://doi.org/10.1371/journal.pone.0210659

Bänärescu P.. 1964. Fauna Republicii Populare Romine. 13. Pisces-Osteichthyes (Pestiganoizi si ososi). Academiei Republicii Populare Romine. Bucharest. 959 pp.

Barra M, Petitgas P, Bonanno A, Somarakis S, Woillez M, Machias A, et al. (2015) Interannual Changes in Biomass Affect the Spatial Aggregations of Anchovy and Sardine as Evidenced by Geostatistical and Spatial Indicators. PLoS ONE 10 (8): e0135808. doi:10.1371/journal.pone.0135808

Bellido JM. Pierce GJ. Romero JL. Millan M (2000) Use of frequency analysis methods to estimate growth of anchovy (Engraulis encrasicolus L. 1758) in the Gulf of Cadiz (SW Spain). Fish Res 48:107-115

Borme D (2006) Ecologia trofica dell'acciuga Engraulis encrasicolus in Adriatico settentrionale. Tesi di dottorato. Università degli studi di Trieste. Trieste

Budnichenko EV. Firulina AV. Bulgakova YV (1999) Feeding conditions of Azov anchovy Engraulis encrasicolus maeoticus during summer-fall 1995-1996. J Ichthyol 39:248-255

Conway DVP. Coombs SH. Smith C (1998) Feeding of anchovy Engraulis encrasicolus larvae in the northwestern Adriatic Sea in response to changing hydrobiological conditions. Mar Ecol Prog Ser 175:35-49

Coombs S.. Giovanardi O.. Conway D.. Manzueto L.. Halliday N. & Barrett C.. 1997. The distribution of eggs and larvae of anchovy (Engraulis encrasicolus) in relation to hydrography and food availability in the out ow of the river Po. Acta Adriat. 38:33±47.

Demir N.. 1963. Synopsis of biological data on anchovy Engraulis encrasicolus (Linnaeus) 1758 (Mediterranean and 1963 adjacent seas). FAO Fish.Synop.. (26) (41 pp.. mimeo - provisional draft)

Demir N.. 1965a.. Synopsis of biological data on anchovy Engraulis encrasicolus (Linnaeus) 1758 (Mediterranean and 1963 adjacent seas). FAO Fish.Synop.. (26) (41 pp.. mimeo - provisional draft)

Donato F., La Mesa M., Santojanni A. (2017). Engraulis encrasicolus. In: Sartor P., Mannini A., Carlucci R., Massaro E., Queirolo S., Sabatini A., Scarcella G., Simoni R. (eds), Sintesi delle conoscenze di biologia, ecologia e pesca delle specie ittiche dei mari italiani / Synthesis of the knowledge on biology, ecology and fishery of the halieutic resources of the Italian seas. Biol. Mar. Mediterr., 24 (Suppl. 1): 240-249.

Falco P. Belardinelli A. Santojanni A. Cingolani N. Russo A. Arneri E (2007) An observing system for the collection of fishery and oceanographic data. Ocean Sci 3:189-203

Gamulin T (1964) Značenje sjevernog plitkog Jadrana za bolje poznavanje pelagičkih riba. Acta Adriat 11(11):91-96

GFCM, 2019. Scientific Advisory Committee on Fisheries (SAC). Working Group on Stock Assessment of Small Pelagic Species (WGSASP). FAO headquarters, Rome, Italy, 9–14 December 2019 REPORT1

Ghirardelli E (1967) I fattori che regolano la microdistribuzione superficiale del plancton: la temperatura. Boll Soc Adr Sci 55:18-86

Kallianiotis, A,. and Mazzola, S. (2002). Final report of EC-DG XIV study project “Study on purse seine activity in Eastern and Central Mediterranean” (MED 99-035).

Mannini A. and Sabatella R.F. (eds) (2015) - Annuario sullo stato delle risorse e sulle strutture produttive dei mari italiani. Biol. Mar. Mediterr., 22 (Suppl. 1): 358 pp.

MIPAFF, 2011. Piano di Gestione per la pesca ai piccoli pelagici con le reti a circuizione della flottiglia siciliana (ex art.24 del Reg. (CE) n.1198/2006 e art.19 del Reg. (CE) n.1967/2006). 19 pp.

Palomera I . (1991) Vertical distribution of eggs and larvae of Engraulis encrasicolus in stratified waters of the western Mediterranean. Mar. Biol. 111: 37-44.

Piccinetti C . (1970) Considerazioni sugli spostamenti delle alici (Engraulis encrasicolus)nell’alto e medio Adriatico. Boll. Pesca Piscic. Idrobiol. 25 (1): 145-157.

Ragusa G.. 2000. Specie ittiche marine commerciali del Mare Mediterraneo. FEDERCOOPESCA. Progetto realizzato con il contributo della Commissione Europea-DG Pesca e del Ministero per le Politiche Agricole e Forestali – Direzione Generale della Pesca e dell’Acquacoltura. pp: 11-12.

Regner S (1972) Contribution to the study of the ecology of the planktonic phase in the life history of the anchovy in the Central Adriatic. Acta Adriat 14:3-31

Regner S.. 1985. Ecology of planktonic stage of the anchovy. Engraulis encrasicolus (Linnaeus. 1758). in the Central Adriatic. Acta Adriat. 26. 1-113.

Russo T, Parisi A, Garofalo G, Gristina M, Cataudella S, et al. (2014) SMART: A Spatially Explicit Bio-Economic Model for Assessing and Managing Demersal Fisheries, with an Application to Italian Trawlers in the Strait of Sicily. PLoS ONE 9(1): e86222. doi:10.1371/journal.pone.0086222

STECF, 2013. Scientific, Technical and Economic Committee for Fisheries (STECF) – 2012 Assessment of Mediterranean Sea stocks part II. (STECF 13-05). 2013. Publications Office of the European Union, Luxembourg, EUR 25309 EN, JRC 81592, 618 pp.

Tortonese E . (1970) Osteichthyes. Pesci ossei. In: E. Calderini (ed) Fauna d'Italia. 11: 89-111.

Tudela S. Palomera I. Quilez G (2002) Feeding of anchovy Engraulis encrasicolus larvae in the north-west Mediterranean. J Mar Biol Ass UK 82:349-350

Varagnolo S (1965) Alcune osservazioni sulla distribuzione delle uova galleggianti di Teleostei nell'Alto Adriatico. Boll Zool 32:849-858

Whitehead PJP. Nelson GJ. Wongratana T (1988) FAO species catalogue. Vol 7 Clupeoid ishes of the world (suborder Clupeioidei). An annotated and illustrated catalogue of the herrings. sardines. pilchards. sprats. shads. anchovies and wolf-herrings. Part 1 – Chirocentridae. Clupeidae and Pristigasterdae. FAO Fish Synop 125(7/2):305-579

### 7.4.2 Catch profiles

Catch profiles are shown in Figure 6

### 7.4.3 Total Allowable Catch (TAC) and catch data

There is not Total Allowable Catch (TAC) agreed for the present stock.

**Table 10.** Total Allowable Catch (TAC) and catch data

| | | | | |
|---|---|---|---|---|
| TAC | Year | 2019 | Amount | NA |
| UoA share of TAC | Year | 2019 | Amount | NA |
| UoA share of total TAC | Year | 2019 | Amount | NA |
| Total green weight catch by UoC | Year (most recent) | 2019 | Amount | Not available |
| Total green weight catch by UoC | Year (second most recent) | 2018 | Amount | Not available |

### 7.4.4 Principle 1 Performance Indicator scores and rationales

## PI 1.1.1 – Stock status

| PI 1.1.1 | | The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | **Stock status relative to recruitment impairment** | | | |
| | Guide post | It is **likely** that the stock is above the point where recruitment would be impaired (PRI). | It is **highly likely** that the stock is above the PRI. | There is a **high degree of certainty** that the stock is above the PRI. |
| | Met? | **NA** | **NA** | **NA** |
| Rationale | | | | |
| The Risk Based Framework (RBF) has been used to score this PI, because there are no reference points available, either derived from analytical stock assessments or using empirical approaches.<br>The status of the fishery with regard to reference points was discussed by interviews with relevant stakeholders during the site visit. This view confirms what was set out in the report by GFCM, which carried out preliminary assessment showing that according with the acoustic survey data the biomass has decreased since 2010.<br>The results of the RBF assessment were:<br>CA Score: 80<br>PSA Score: 88 (PS); 88 (PTM); 93 (OTB)<br>The MSC CR indicates that for scores at this level, the overall RBF score awarded shall be at the mid-point of the two scores (see CRv2.0, Table PF7).<br><br>A score of 85 is therefore awarded for this PI. | | | | |
| **b** | **Stock status in relation to achievement of Maximum Sustainable Yield (MSY)** | | | |
| | Guide post | | The stock is at or fluctuating around a level consistent with MSY. | There is **a high degree of certainty** that the stock has been fluctuating around a level consistent with MSY or has been above this level over recent years. |
| | Met? | | **NA** | **NA** |
| Rationale | | | | |
| The Risk Based Framework has been used to score this PI. | | | | |
| References | | | | |
| GFCM, 2019. | | | | |

**Stock status relative to reference points**

| | Type of reference point | Value of reference point | Current stock status relative to reference point |
|---|---|---|---|
| Reference point used in scoring stock relative to PRI (SIa) | NA | NA | NA |
| Reference point used in scoring | NA | NA | NA |

| PI 1.1.1 | The stock is at a level which maintains high productivity and has a low probability of recruitment overfishing | | |
|---|---|---|---|
| stock relative to MSY (SIb) | | | |
| **Overall Performance Indicator (PI) Rationale** | | | |
| | | | |
| Draft scoring range | | ≥80 | |
| Information gap indicator | | Information sufficient to score PI | |
| Data-deficient? (Risk-Based Framework needed) | | Yes | |

## PI 1.1.2 – Stock rebuilding

| PI 1.1.2 | | Where the stock is reduced, there is evidence of stock rebuilding within a specified timeframe | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | **Rebuilding timeframes** | | | |
| | Guide post | A rebuilding timeframe is specified for the stock that is the **shorter of 20 years or 2 times its generation time**. For cases where 2 generations is less than 5 years, the rebuilding timeframe is up to 5 years. | | The shortest practicable rebuilding timeframe is specified which does not exceed **one generation time** for the stock. |
| | Met? | NA | | NA |
| Rationale | | | | |
| According to Table PF1 of MSC GCRv2.0, if the RBF is used to score PI 1.1.1, this PI is not scored. | | | | |
| **b** | **Rebuilding evaluation** | | | |
| | Guide post | Monitoring is in place to determine whether the rebuilding strategies are effective in rebuilding the stock within the specified timeframe. | There is **evidence** that the rebuilding strategies are rebuilding stocks, **or it is likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**. | There is **strong evidence** that the rebuilding strategies are rebuilding stocks, **or it is highly likely** based on simulation modelling, exploitation rates or previous performance that they will be able to rebuild the stock within the **specified timeframe**. |
| | Met? | NA | NA | NA |
| Rationale | | | | |
| According to Table PF1 of MSC GCRv2.0, if the RBF is used to score PI 1.1.1, this PI is not scored. | | | | |
| References | | | | |
| List any references here, including hyperlinks to publicly-available documents. | | | | |
| Overall Performance Indicator (PI) Rationale | | | | |
| Rationale is provided for each Scoring Issue. | | | | |
| Draft scoring range | | NA | | |
| Information gap indicator | | NA | | |

## PI 1.2.1 – Harvest strategy

| PI 1.2.1 | | There is a robust and precautionary harvest strategy in place | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | **Harvest strategy design** | | | |
| | Guide post | The harvest strategy is **expected** to achieve stock management objectives reflected in PI 1.1.1 SG80. | The harvest strategy is responsive to the state of the stock and the elements of the harvest strategy **work together** towards achieving stock management objectives reflected in PI 1.1.1 SG80. | The harvest strategy is responsive to the state of the stock and is **designed** to achieve stock management objectives reflected in PI 1.1.1 SG80. |
| | Met? | Yes | No | No |

Rationale

*MSC defines a harvest strategy as 'the combination of monitoring, stock assessment, harvest control rules and management actions, which may include a Management Plan (MP) or an MP (implicit) and be tested by MSE' (MSC – MSCI Vocabulary v1.1).*
*Also, since the RBF was used in PI 1.1.1, informal approaches are assessed against PI 1.2.1 according to MSC GCRv2.0 (GSA2.4) MSC defines assessment of data-deficient fisheries against this indicator should consider how elements of the harvest strategy combine to manage impact, such that susceptibility is maintained at or below acceptable levels given the productivity of the species.*

- *The assessment should factor in the likelihood of changes within the fishery that could potentially lead to an increase in the risk of impact from fishing activity over time.*
- *Teams should further consider how elements of the strategy are combining to ensure that the fishery is moving in the desired direction or operating at a low risk level and that qualitative or semi-quantitative objectives are being achieved.*
- *There should be evidence that the expected objectives are being achieved. Evidence may be demonstrated through local knowledge or research.*
- *CABs should determine the extent to which there is a feedback and learning mechanism to inform the harvest strategy on an ongoing basis. Depending on the scale of the fishery this could be through informal stakeholder processes that are based on local knowledge of the fishery or any other less subjective review process.*

The stock is not considered to be shared with other countries and Italy performs a data collection program under the EU-MAP, where the fleets exploiting the present stock are routinely monitored (see Italian DCF National programme[2]). Moreover, although the last GFCM-WGSASP report did not estimate reference points for such stock (see section **Error! Reference source not found.**), evaluations are routinely carried out both in the framework of working group on stock assessment of small pelagic species in GFCM and in the framework of STECF (e.g.: STECF, 2013). The management plan (MIPAAF, 2011) specific for fishing vessels registered in the Sicilian maritime compartments that practice purse seine and pelagic pair trawl fisheries, has as objective to recover the stocks within biological safety limit. The MP clearly states the need to make the methods and intensity of the harvest compatible

[2] https://datacollection.jrc.ec.europa.eu/np/2014/-/document_library_display/z9Yv/view/688307?_110_INSTANCE_z9Yv_topLink=home&_110_INSTANCE_z9Yv_delta2=20&_110_INSTANCE_z9Yv_keywords=&_110_INSTANCE_z9Yv_advancedSearch=false&_110_INSTANCE_z9Yv_andOperator=true&p_r_p_564233524_resetCur=false&_110_INSTANCE_z9Yv_cur2=2

| PI 1.2.1 | There is a robust and precautionary harvest strategy in place |
|---|---|

with the potential for biological renewal of the species involved in this fishery. The plan aims to achieve, in the case of small pelagic, an improvement in sustainability by controlling the exploitation rate and monitoring the amount of biomass available. The objective can be achieved through the implementation of the adjustment plan envisaged by the national Operational Program associated with the measures referred in the management plan. Such objectives are in general agreement with CFP requirements and in accordance with MSC objectives reflected in PI 1.1.1 SG80. PSA analysis demonstrates that the stock has high productivity. Although vertical and areal overlaps with the gears are high, selectivity shows low risk Post-capture mortality was scored as high, since survival of post-capture specimens is clearly high risk. The elements of the harvest strategy listed above are keeping effort in the fishery stable or decreasing in the case of purse seine (Figure 10) and impact on the stock is relatively low in term of susceptibility.

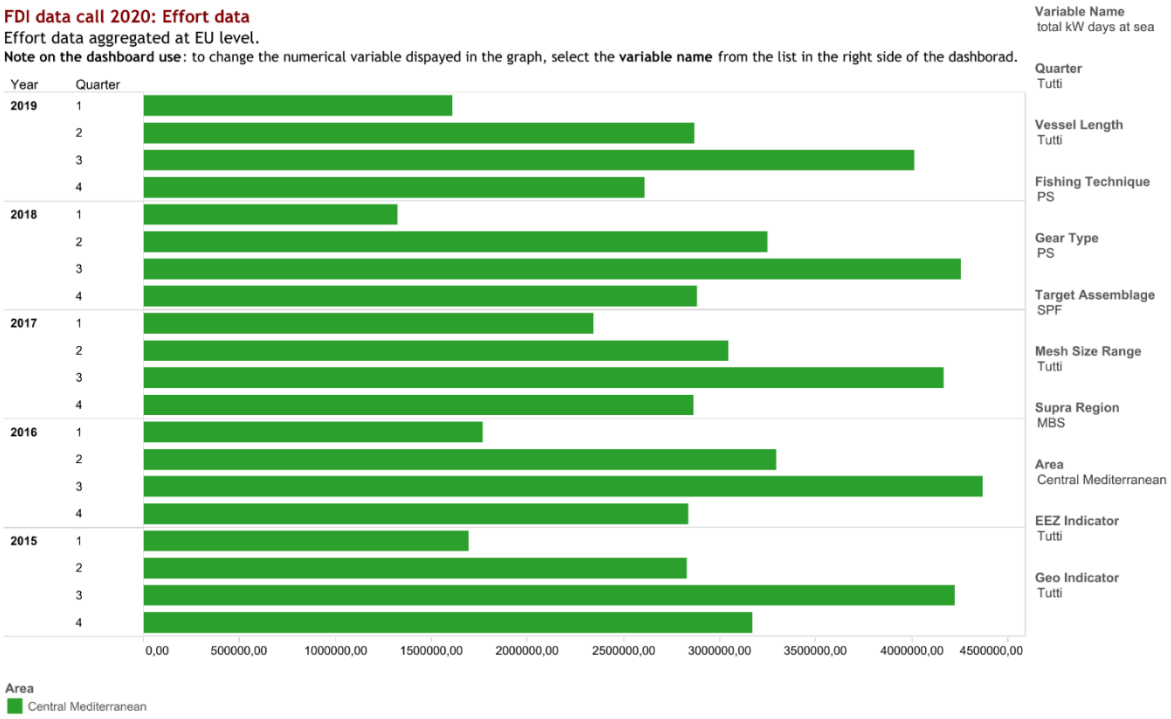



**Figure 10** – Trend of purse seine fishing effort in Central Mediterranean. (FDI data call - https://stecf.jrc.ec.europa.eu/dd/fdi/graphs).

Thus, as also showed by the simulations in Figure 2 and Figure 3 the HS is expected to maintain the stock at high level of biomass and can manage the impact on the stock, in general with management objectives reflected in PI 1.1.1 SG80. Therefore, SG60 is met.
However, the rules for specifying the management measures are not responsive to the state of the stock and there is no evidence that they work towards achieving stock management objectives reflected in PI 1.1.1 SG80. Thus, SG80 and 100 are not met.

| b | Harvest strategy evaluation |
|---|---|

| PI 1.2.1 | | There is a robust and precautionary harvest strategy in place | | |
|---|---|---|---|---|
| | Guide post | The harvest strategy is **likely** to work based on prior experience or plausible argument. | The harvest strategy may not have been fully **tested** but evidence exists that it is achieving its objectives. | The performance of the harvest strategy has been **fully evaluated** and evidence exists to show that it is achieving its objectives including being clearly able to maintain stocks at target levels. |
| | Met? | Yes | No | No |
| Rationale | | | | |
| In Italy, the performance of the harvest strategy has not been fully evaluated. However, the simulations in Figure 2 and Figure 3 and the fact that the small pelagics fishery is active since many years in the area can represent a plausible argument that the HS is likely to work. Therefore, only SG 60 is met. However, there is not a clear evidence that the HS is achieving its objectives. Therefore, SG 80 and 100 are not met. | | | | |
| **c** | **Harvest strategy monitoring** | | | |
| | Guide post | Monitoring is in place that is expected to determine whether the harvest strategy is working. | | |
| | Met? | Yes | | |
| Rationale | | | | |
| In Italy monitoring is in place on the catches and abundance at sea respectively monitored with an observer programme and with research vessel surveys (see Italian DCF National programme: https://datacollection.jrc.ec.europa.eu/np/2014/-/document_library_display/z9Yv/view/688307?_110_INSTANCE_z9Yv_topLink=home&_110_INSTANCE_z9Yv_delta2=20&_110_INSTANCE_z9Yv_keywords=&_110_INSTANCE_z9Yv_advancedSearch=false&_110_INSTANCE_z9Yv_andOperator=true&p_r_p_564233524_resetCur=false&_110_INSTANCE_z9Yv_cur2=2). Such data are used in stock assessments to determine the status of the stock. Therefore SG 60 is met. | | | | |
| **d** | **Harvest strategy review** | | | |
| | Guide post | | | The harvest strategy is periodically reviewed and improved as necessary. |
| | Met? | | | No |
| Rationale | | | | |
| There is no evidence that all the elements of the harvest strategy are periodically reviewed. Therefore SG 100 is not met. Moreover, as per FCP 7.17.7.4, if SG80 is not met for all SIs then SG100 is not scored. | | | | |
| **e** | **Shark finning** | | | |
| | Guide post | It is **likely** that shark finning is not taking place. | It is **highly likely** that shark finning is not taking place. | There is a **high degree of certainty** that shark finning is not taking place. |
| | Met? | NA | NA | NA |

| PI 1.2.1 | | There is a robust and precautionary harvest strategy in place | | |
|---|---|---|---|---|
| Rationale | | | | |
| The stock is not a shark. This Scoring issue is not applicable. | | | | |
| **f** | **Review of alternative measures** | | | |
| | Guide post | There has been a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock. | There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock and they are implemented as appropriate. | There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of the target stock, and they are implemented, as appropriate. |
| | Met? | NA | NA | NA |
| Rationale | | | | |
| Definition of 'unwanted catch' (as per MSC SA3.1.6): *the term 'unwanted catch' shall be interpreted by the team as the part of the catch that a fisher did not intend to catch but could not avoid, and did not want or chose not to use*. In the present fishery unwanted catches of European anchovy are considered negligible (see STECF, 2013). Moreover, specific measures are in place to protect juveniles fishing as area closures and ban on discarding fish. Hence this PI is scored as not applicable. | | | | |
| References | | | | |
| GFCM, 2019; MIPAFF, 2011 | | | | |
| Overall Performance Indicator (PI) Rationale | | | | |
| Rationale is provided for each Scoring Issue. | | | | |
| Draft scoring range | | 60-79 | | |
| Information gap indicator | | More information sought<br>*Information about new management plan and management measures implemented recently that would change the scoring* | | |

## PI 1.2.2 – Harvest control rules and tools

| PI 1.2.2 | | There are well defined and effective harvest control rules (HCRs) in place | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | **HCRs design and application** | | | |
| | Guide post | **Generally understood** HCRs are in place **or available** that are **expected** to reduce the exploitation rate as the point of recruitment impairment (PRI) is approached. | **Well defined** HCRs are **in place** that **ensure** that the exploitation rate is reduced as the PRI is approached, are expected to keep the stock **fluctuating around** a target level consistent with (or above) MSY, or for key LTL species a level consistent with ecosystem needs. | The HCRs are expected to keep the stock **fluctuating at or above** a target level consistent with MSY, or another more appropriate level taking into account the ecological role of the stock, **most** of the time. |
| | Met? | Yes | No | No |
| Rationale | | | | |
| *Since the RBF was used in PI 1.1.1, informal approaches are assessed against PI 1.2.2 according to MSC GCRv2.0 (GSA2.5.2) In informally managed fisheries, CABs should assess the extent to which there are management tools and measures in place that are consistent with ensuring that susceptibility of the target species to removal is no higher than that which would cause the risk to the target species to be above an acceptable risk range. Measures could be spatial, temporal, or changes to gear overlap.*<br>*Assessments should also consider measures in place to respond to changes in the fishery, for example, by reducing the susceptibility of target species when the fishery is not heading in the direction of its objectives.*<br><br>In the present fishery the harvest control rules are a set of management measures as reported in 7.4.1.4. These include spatial and temporal limitations, which restrict the areas where fishing is allowed and protect juveniles. The fishery is also subject to effort limitations imposed by authorities. There is also a decommissioning plan on the capacity. Given the fact that anchovy is a highly productive species the team concludes that removal from the fishery is maintained at levels that is below that which is likely to cause a risk to the target species. RBF scores confirm that the species is exploited below full exploitation rate of MSY. Therefore, it is possible to conclude that there are measures available to respond to changes in the fishery (effort reduction and area closure) and HCRs can be regarded as 'generally understood' considering that they have been applied in some way in the past in the framework of the Italian MP (MIPAAF, 2011). The HCRs comprise measures as fishing capacity adjustment, reduction of fishing activity, catch management, area closure and minimum sizes on landing, which are expected to reduce the exploitation on the target stock that was considered close to PRI as presented in Figure 2 and 3. **Thus, SG 60 is met.** However, it is clear that the HCR are not well defined and have not been explicitly defined or agreed, for example the reduction of fishing effort did not follow the simulation scenarios presented in the Italian MP (MIPAAF, 2011) also the MP does not clearly state what actions will be taken at what specific trigger reference point levels. Therefore SG 80 and 100 are not met. | | | | |
| b | **HCRs robustness to uncertainty** | | | |
| | Guide post | | The HCRs are likely to be robust to the main uncertainties. | The HCRs take account of a **wide** range of uncertainties including the ecological role of the stock, and there is **evidence** that the HCRs are |

| PI 1.2.2 | | There are well defined and effective harvest control rules (HCRs) in place | | |
|---|---|---|---|---|
| | | | | robust to the main uncertainties. |
| | Met? | | No | No |
| Rationale | | | | |
| There is no evidence that the HCRs are taking into account any uncertainty. Therefore, SG 80 and 100 are not met. | | | | |
| **c** | **HCRs evaluation** | | | |
| | Guide post | There is **some evidence** that tools used **or available** to implement HCRs are appropriate and effective in controlling exploitation. | **Available evidence indicates** that the tools in use are appropriate and effective in achieving the exploitation levels required under the HCRs. | **Evidence clearly shows** that the tools in use are effective in achieving the exploitation levels required under the HCRs. |
| | Met? | Yes | No | No |
| Rationale | | | | |
| The main tools to implement the HCRs is the effort reduction and spatial-temporal closures. Both measures show some evidence that are appropriate and effective in limiting respectively the impact on the population size (see CA) and improving the selectivity in the susceptibility analysis (see PSA). Therefore, SG 60 is met.<br>However, such evidences are not directly indicating that the tools are effective in achieving the exploitation levels required under the HCRs. Therefore, SG 80 and 100 are not met. | | | | |
| References | | | | |
| GFCM, 2019; MIPAFF, 2011; STECF, 2013 | | | | |
| Overall Performance Indicator (PI) Rationale | | | | |
| Rationale is provided for each Scoring Issue. | | | | |
| Draft scoring range | | | 60-79 | |
| Information gap indicator | | | More information sought<br>*Information about new HCRs implemented recently that would change the scoring* | |

## PI 1.2.3 – Information and monitoring

| PI 1.2.3 | | Relevant information is collected to support the harvest strategy | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Range of information | | | |
| | Guide post | **Some** relevant information related to stock structure, stock productivity and fleet composition is available to support the harvest strategy. | **Sufficient** relevant information related to stock structure, stock productivity, fleet composition and other data are available to support the harvest strategy. | A **comprehensive range** of information (on stock structure, stock productivity, fleet composition, stock abundance, UoA removals and other information such as environmental information), including some that may not be directly related to the current harvest strategy, is available. |
| | Met? | Yes | Yes | No |
| Rationale | | | | |
| A sufficient range of information, including some that may not be directly relevant to the current harvest strategy, is available (see Italian DCF National programme: https://datacollection.jrc.ec.europa.eu/np/2014/-/document_library_display/z9Yv/view/688307?_110_INSTANCE_z9Yv_topLink=home&_110_INSTANCE_z9Yv_delta2=20&_110_INSTANCE_z9Yv_keywords=&_110_INSTANCE_z9Yv_advancedSearch=false&_110_INSTANCE_z9Yv_andOperator=true&p_r_p_564233524_resetCur=false&_110_INSTANCE_z9Yv_cur2=2) as well as data used directly in the stock assessment (catch-at-age, survey and LPUE data), additional information includes changing patterns of growth, the relative spatial distribution of juvenile and adult and removals from other fleets. This meets the requirements at SG60 and 80. However, the last GFCM WG on small pelagics evidenced the following issues: "*The catch weight and age readings were not available for the period 2002-2008 thus the LFD expansion was made by considering the average LFD in the period 2009-2014. For few catches, the reported fishing area was Lampedusa that is outside the GSA16*". Therefore, SG 100 is not met. | | | | |
| **b** | Monitoring | | | |
| | Guide post | Stock abundance and UoA removals are monitored and **at least one indicator** is available and monitored with sufficient frequency to support the harvest control rule. | Stock abundance and UoA removals are **regularly monitored at a level of accuracy and coverage consistent with the harvest control rule**, and **one or more indicators** are available and monitored with sufficient frequency to support the harvest control rule. | **All information** required by the harvest control rule is monitored with high frequency and a high degree of certainty, and there is a good understanding of inherent **uncertainties** in the information [data] and the robustness of assessment and management to this uncertainty. |
| | Met? | Yes | Yes | No |
| Rationale | | | | |
| The data required by the harvest control rule (mainly effort) are monitored with high frequency and at a level of accuracy and coverage consistent with the HCR. The main information required to support the stock assessment are | | | | |

| PI 1.2.3 | Relevant information is collected to support the harvest strategy | | | |
|---|---|---|---|---|
| the total catches, age and weight composition of the catches, abundance surveys together with age and weight composition of the survey catch. Therefore SG 60 and 80 are met.<br>However, the understanding of some of the uncertainties in the data is incomplete (e.g. stock unit) and some of the data used to model are potentially missing (see 1.2.3a). Taking also into consideration the recommendation of the last GFCM-WG on small pelagics (GFCM, 2019): "*For the future workplan it was suggested to re-evaluate the acoustic survey index to take into account possible population distribution/migration over the north part of Sicily, re-evaluate the time series of the catches regarding the possible inclusion of landings outside GSA16 in the current time-series*", it is not possible to conclude that there is a good understanding of inherent uncertainties in the information. Therefore SG 100 is not met. | | | | |
| **c** | Comprehensiveness of information | | | |
| | Guide post | | There is good information on all other fishery removals from the stock. | |
| | Met? | | Yes | |
| Rationale | | | | |
| The other fisheries exploiting the stock is the pelagic pair trawl and the bottom otter trawl fisheries which, are monitored in the same way of the present UoA. Therefore, SG 80 is met. | | | | |
| References | | | | |
| GFCM, 2019; MIPAFF, 2011; STECF, 2013; Donato et al., 2017. | | | | |
| Overall Performance Indicator (PI) Rationale | | | | |
| Rationale is provided for each Scoring Issue. | | | | |
| Draft scoring range | ≥80 | | | |
| Information gap indicator | Information sufficient to score PI | | | |

## PI 1.2.4 – Assessment of stock status

| PI 1.2.4 | | There is an adequate assessment of the stock status | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Appropriateness of assessment to stock under consideration | | | |
| | Guide post | | The assessment is appropriate for the stock and for the harvest control rule. | The assessment takes into account the major features relevant to the biology of the species and the nature of the UoA. |
| | Met? | | NA | NA |
| Rationale | | | | |
| If the RBF is used to score PI 1.1.1, this PI is not scored and is awarded a default score of 80 (see MSC FCP 2.1: PF1.1.2 & Table PF1). | | | | |
| **b** | Assessment approach | | | |
| | Guide post | The assessment estimates stock status relative to generic reference points appropriate to the species category. | The assessment estimates stock status relative to reference points that are appropriate to the stock and can be estimated. | |
| | Met? | NA | NA | |
| Rationale | | | | |
| If the RBF is used to score PI 1.1.1, this PI is not scored and is awarded a default score of 80 (see MSC FCP 2.1: PF1.1.2 & Table PF1). | | | | |
| **c** | Uncertainty in the assessment | | | |
| | Guide post | The assessment **identifies major sources** of uncertainty. | The assessment takes uncertainty into account. | The assessment takes into account uncertainty and is evaluating stock status relative to reference points in a **probabilistic** way. |
| | Met? | NA | NA | NA |
| Rationale | | | | |
| If the RBF is used to score PI 1.1.1, this PI is not scored and is awarded a default score of 80 (see MSC FCP 2.1: PF1.1.2 & Table PF1). | | | | |
| **d** | Evaluation of assessment | | | |
| | Guide post | | | The assessment has been tested and shown to be robust. Alternative hypotheses and assessment approaches have been rigorously explored. |
| | Met? | | | NA |

| PI 1.2.4 | | There is an adequate assessment of the stock status | | |
|---|---|---|---|---|
| Rationale | | | | |
| | | | | |
| e | Peer review of assessment | | | |
| | Guide post | | The assessment of stock status is subject to peer review. | The assessment has been **internally and externally** peer reviewed. |
| | Met? | | NA | NA |
| Rationale | | | | |
| If the RBF is used to score PI 1.1.1, this PI is not scored and is awarded a default score of 80 (see MSC FCP 2.1: PF1.1.2 & Table PF1). | | | | |
| References | | | | |
| | | | | |
| Overall Performance Indicator (PI) Rationale | | | | |
| Rationale is provided for each Scoring Issue. | | | | |
| Draft scoring range | | | ≥80 | |
| Information gap indicator | | | Information sufficient to score PI | |

## 7.5 Principle 2

### 7.5.1 Principle 2 background

**MSC Principle 2**

Principle 2 of the MSC standard sets requirements for fishing operations that allow for the maintenance of the structure, productivity, function and diversity of the ecosystem (including habitat and associated dependent and ecologically related species) on which the fishery depends. Principle 2 is designed to specifically assess the outcome, management and information aspects relating to all the key ecosystem components: primary and secondary species (i.e. unwanted catch that may be managed or unmanaged, respectively), Endangered, Threatened, or Protected (ETP) species, habitats and ecosystems. Each P2 species is considered within only one of the primary species, secondary species or ETP species components. Primary and Secondary Species above making up more than 5% of the overall catch profile of a UoA are classified as Main, while anything below it is classified as Minor. However, if a minor species is defined "less resilient" as per MSC specifications, these species are classified as Main.

**P2 Scoring Elements**

The following table presents the scoring elements identified for principle 2.

**Table 11.** Scoring elements.

| Component | Scoring elements | Designation | Data-deficient |
|---|---|---|---|
| e.g. P1, Primary, Secondary, ETP, Habitats, Ecosystems | e.g. species or stock (SA 3.1.1.1) | Main/Minor? | Yes/No? |
| P2. Secondary species | European pilchard (*Sardina pilchardus*) | Main | Yes |
| P2. Secondary species | Salema (*Sarpa salpa*) | Minor | Yes |
| | Round sardinella (*Sardinella aurita*) | Minor | Yes |
| | Atlantic mackerel (*Scomber scombrus*) | Minor | Yes |
| P2. ETP species | Short-beaked common dolphin *Delphinus delphis* | NA | No |
| P2. Habitats | Water column | Commonly encountered habitats | No |
| | No minor habitats identified | Minor habitats | No |
| | Marine seagrasses and coralligenous communities | VMEs | No |

**Non target species (Primary/Secondary species)**

To categorise primary and secondary species for the UoA in question, the assessment team used data from the second stage of the Blufish project, the deeper mapping phase. These are shown in the table below.

**Table 12.** List of species detected for the UoA using purse seine (PS) for small pelagic fish (SPF) in the GSA 16 in 2015 and 2016. The species underlined are above the 5% threshold for main species.

| Italian name | English name | Scientific name | Mean landing in weight 2015-2016 (Ton) | Percentage (%) |
|---|---|---|---|---|
| Alici | European anchovy | *Engraulis encrasicolus* | 1257.148 | 53.751 |
| Sardine | European pilchard(=Sardine) | *Sardina pilchardus* | 851.856 | 36.422 |
| Salpa | Salema | *Sarpa salpa* | 106.359 | 4.548 |
| Alaccia | Round sardinella | *Sardinella aurita* | 53.093 | 2.270 |
| Sgombro | Atlantic mackerel | *Scomber scombrus* | 19.690 | 0.842 |
| Sugarello o suro | Atlantic horse mackerel | *Trachurus trachurus* | 11.205 | 0.479 |
| Ricciole | Greater amberjack | *Seriola dumerili* | 9.430 | 0.403 |
| Lanzardo atlantico | Atlantic chub mackerel | *Scomber colias* | 6.877 | 0.294 |
| Boghe | Bogue | *Boops boops* | 4.476 | 0.191 |
| Scombroidei | Frigate and bullet tunas | *Auxis thazard, A. rochei* | 4.437 | 0.190 |
| Occhiate | Saddled seabream | *Oblada melanura* | 3.979 | 0.170 |
| Tonnetto | Little tunny (=Atl.black skipj) | *Euthynnus alletteratus* | 3.001 | 0.128 |
| Lampughe | Common dolphinfish | *Coryphaena hippurus* | 2.686 | 0.115 |
| Altri pesci | Marine fishes nei | *Osteichthyes* | 1.827 | 0.078 |
| Sugarello pittato | Blue jack mackerel | *Trachurus picturatus* | 1.008 | 0.043 |
| Palamita | Atlantic bonito | *Sarda sarda* | 0.789 | 0.034 |
| Zerro musillo | Curled picarel | *Centracanthus cirrus* | 0.515 | 0.022 |
| Calamaro mediterraneo | European squid | *Loligo vulgaris* | 0.216 | 0.009 |
| Totano comune | Broadtail shortfin squid | *Illex coindetii* | 0.088 | 0.004 |
| Sarago maggiore | White seabream | *Diplodus sargus* | 0.086 | 0.004 |
| Pesce sciabola | Silver scabbardfish | *Lepidopus caudatus* | 0.061 | 0.003 |

*Source: estimates from MIPAAFT/National Fisheries Data Collection Programme*

**Primary Species**

Of the species listed below, none is managed with reference points, hence there are no primary species in this UoA.

**Secondary Species**

All the species listed below are not managed with reference points and are therefore classified as secondary species.

**European pilchard (*Sardina pilchardus*) – 36.4% of catch profile**

Sardine in GSA 16 are mainly targeted by purse seine (PS) and midwater pair trawl (PTM). Acoustic biomass estimates in GSA16 evidenced a strong decrease in the period 2015-2018. Considering the time series of landing (1989-2018) the maximum recorded value was ~10000 tonnes, while in 2017 the minimum value was recorded (342 tonnes). In 2018 landings slightly increased (~750 tonnes) with respect to 2017 (342 tonnes), but remained well below the average landings of the previous 5 years (~1500 tonnes). Age structure in both landings and survey evidenced very few individuals of ages 2 and 3, thus the stock mainly relies on age 1 group. The figure below provides landings (by gear type) and survey biomass information.

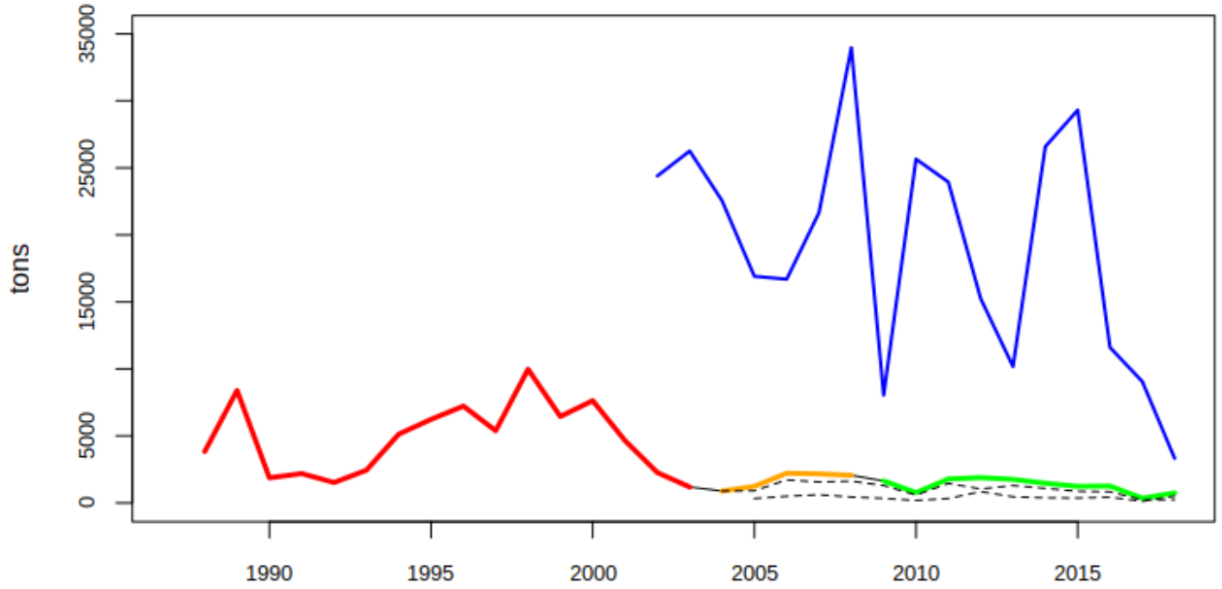



**Figure 11.** Trends in landings (green: age readings available; orange: age readings not available; red: only information on total landings are available) and acoustic biomass estimates (blue line). Dashed lines represent landings from PTM and PS.

**Stock assessment**

For stock assessment purposes XSA and a4a models were carried out. An updated vBG was used based on data from GSA16 resulting in an updated natural mortality estimate. The fit of the survey was problematic in all cases. Both models provided the same signal regarding the status of the stock. The two models lead to similar results about the general status of the stock, and in particular quite close Fbar values were recorded for the terminal year, even if the Fbar trend in the last 2 years was increasing for XSA and decreasing for a4a Considering the opposite trends of the two models in the last 2 years and the high k values used in a4a sub-models (in order to obtain a proper convergence), the Working Group agreed to consider the assessment as qualitative. Results of the assessment are shown below.

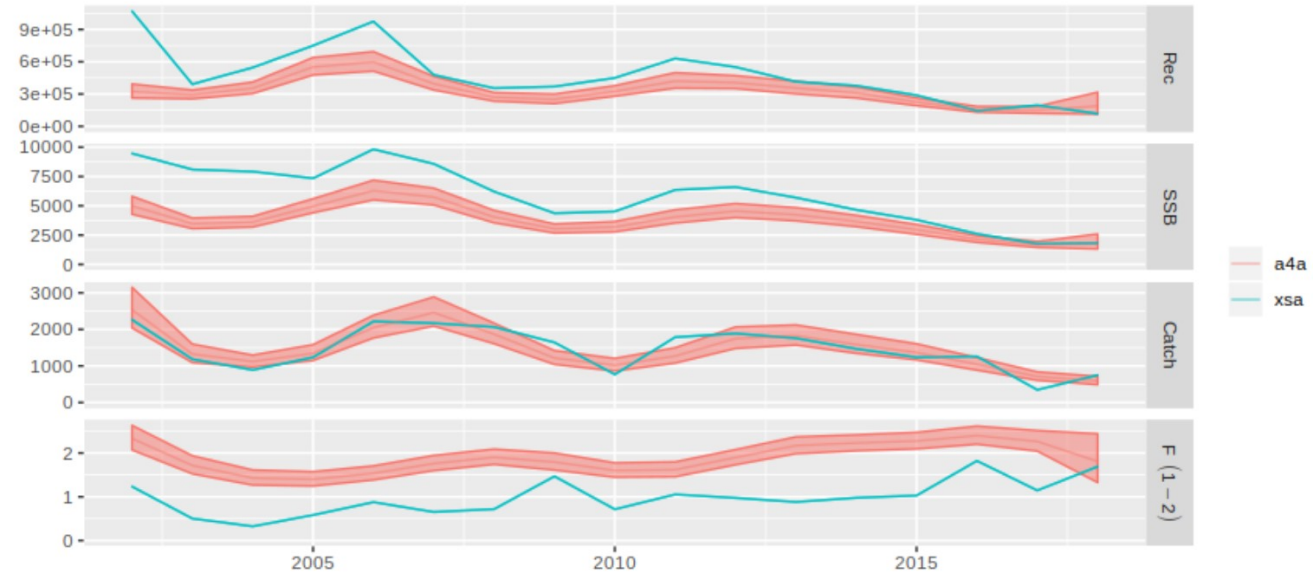
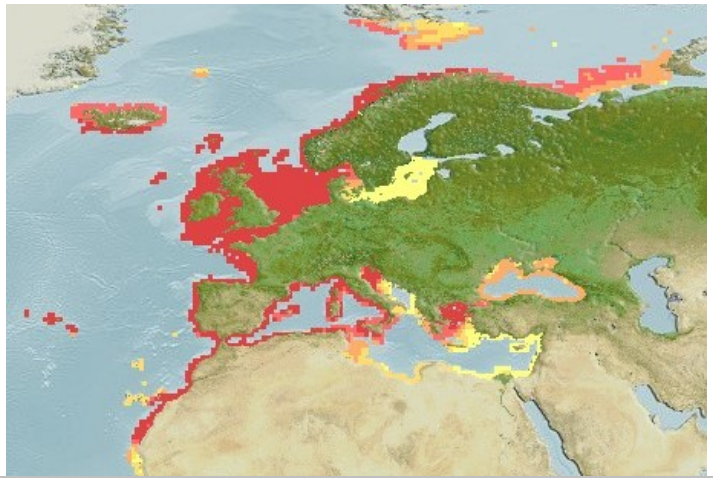



**Figure 12.** Graphical representation of the XSA (blue line) and a4a (red line) output.

The 2019 GFCM WGSASP report[3] considered this stock to be undergoing overexploitation. The advice was to reduce exploitation. The WG endorsed as validated assessment the a4a model and considered it as quantitative advice due to uncertainties in the terminal year estimates. Due to the short time series no biomass reference point was estimated. This species is classified as **secondary main**. Due to the lack of reference points, the species is assessed using the PSA, the results of which are shown below.

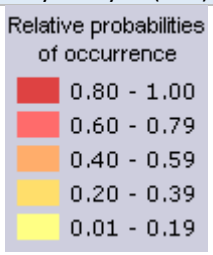
**Table 13.** Productivity Susceptibility Analysis (PSA) productivity attributes and scores.

| Performance Indicator | 2.2.1 | |
|---|---|---|
| **Productivity** | | |
| Scoring element (species) | European pilchard (*Sardina pilchardus*) – information taken from Fishbase' Life History Toolkit[4] | |
| **Attribute** | Rationale | Score |
| Average age at maturity | 1.7 years | **1** |
| Average maximum age | 5.9 years | **1** |
| Fecundity | 156,525 [ 50,000-490,000 ] Estimated as geometric mean. | **1** |
| Average maximum size<br>Not scored for invertebrates | 27.5 cm | **1** |
| Average size at maturity<br>Not scored for invertebrates | 10.5 cm | **1** |
| Reproductive strategy | nonguarders: open water/substratum egg scatterers | **1** |
| Trophic level | 3.1 | **2** |
| Density dependence<br>Invertebrates only | N/A | **-** |
| **Susceptibility** | | |
| Fishery<br>Only where the scoring element is scored cumulatively | *Purse seine* | |
| **Attribute** | Rationale | Score |
| Areal Overlap | European pilchard is common in the western part of the Mediterranean and in Adriatic Sea, and rare in the eastern part; also present in the Sea of Marmara and Black Sea.<br>  | **2** |

[3] http://www.fao.org/gfcm/technical-meetings/detail/en/c/1274635/

[4] https://www.fishbase.se/popdyn/KeyfactsSummary_1.php?ID=1350&GenusName=Sardina&SpeciesName=pilchardus&vStockCode=1368&fc=43

**Table 13.** Productivity Susceptibility Analysis (PSA) productivity attributes and scores.

| | | |
|---|---|---|
| |  <br>Computer generated distribution maps for *Sardina pilchardus* (European pilchard), with modelled year 2050 native range map based on IPCC RCP8.5 emissions scenario. www.aquamaps.org, version 10/2019.<br><br>Aeral overlap is estimated at 10-30% | |
| Encounterability | Sardine form schools, usually at depths of 25 to 55 or even 100 m by day, rising to 10 to 35 m at night. This depth matches the gear deployment depth of the purse seine fishery. A high overlap with fishing gear (high encounterability) is estimated. | **3** |
| Selectivity of gear type | For surrounding nets the minimum mesh size shall be 14 mm. *Sardina pilchardus* has a minimum landing size (MLS) of 11 cm. Individuals < size at maturity would be frequently caught. | **3** |
| Post capture mortality | Sardine would be retained species. Retained species or majority dead when released. Default score of 3 for retained species (Principle 1 or Principle 2). | **3** |
| Catch (weight)<br>Only where the scoring element is scored cumulatively | NA | - |
| Fishery<br>Only where the scoring element is scored cumulatively | *NA* | |

Sardine achieves an MSC PSA-derived score of 84, as shown below:

| | | | | | Productivity Scores [1-3] | | | | | | | | Susceptibility Scores [1-3] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Family name** | **Scientific name** | **Common name** | **Species type** | **Fishery descriptor** | Average age at maturity | Average max age | Fecundity | Average max size | Average size at Maturity | Reproductive strategy | Trophic level | Density Dependance | Total Productivity (average) | Availability | Encounterability | Selectivity | Post-capture mortality | Total (multiplicative) | **MSC PSA-derived score** | Risk Category Name | MSC scoring guidepost |
| Clupeidae | Sardina pilchardus | Sardine | Non-invert. | Purse seine | **1** | **1** | **1** | **1** | **1** | **1** | **2** | | **1.14** | **2** | **3** | **3** | **3** | **2.33** | **84** | **Low** | **≥80** |

## Management

### Technical measures

The Italian fisheries management system is largely based on fishing effort control through input measures.

The fishing effort is managed through:

a) fishing licenses: fish resources can be exploited only by subjects holding a regular license (law no. 41/1982);
b) control of fishing capacity: capacity cannot exceed at any time the limits set by Regulation (EU) No 1380/2013 (Annex II: for Italy, 173,506 GT and 1,070,028 kW).

The management system also includes a number of important technical measures, which were introduced by Regulation (EU) No 1967/2006 (Mediterranean Regulation)[5] and last updated in 2019. These measures came into force only in 2010. The most important with relevance to sardine involve:

1) For surrounding nets the minimum mesh size shall be 14 mm.
2) The use of purse seines shall be prohibited within 300 meters of the coast or within the 50 metres isobath where that depth is reached at a shorter distance from the coast.
3) A purse seine shall not be deployed at depths less than 70 % of the overall drop of the purse seine itself as measured in Annex II of Regulation 1967/2006.
4) For highly migratory species and small pelagic species any amount greater than 50 kg of live-weight equivalent must be recorded in the logbook
5) Vessels of more than 15 metres overall length flying its flag and registered in its territory that it authorises to fish in the GFCM area by issue of a fishing permit.
6) The length of netting shall be restricted to 800 m and the drop to 120 m, except in the case of tuna seines.
7) *Sardina pilchardus* has a minimum landing size (MLS) of 11 cm (Member States may convert the minimum size into 55 specimens per kg).
8) Fishing with trawl nets, dredges, shore seines or similar nets above coralligenous habitats and mäerl beds shall be prohibited.
9) Fishing with purse seines, boat seines, shore seines or similar nets above seagrass beds of, in particular, *Posidonia oceanica* or other marine phanerogams is prohibited, unless they do not physically touch the seabed[6].

**Management Plans**

In addition to technical measures, some management plans were published in Italy[7]. A Fishery Management Plan for small pelagics such as anchovies, sardine and mackerel caught with purse seines in Sicily (including GSA 16) has been published in 2011[8]. The objective of the management plan is the recovery of stocks within safe biological limits. The management plan called for:

1) 3% reduction in effort
2) Fishing season from 15th of March to 15th of November
3) Fishing permits
4) Data collection (fleet capacity, effort, CPUE, biological data such as length, age and discards).

**Information**

In the Strait of Sicily, since 1998, the IAMC-CNR of Mazara del Vallo has been carrying out with regularity (at least once a year) acoustic surveys aimed at assessing the abundance and the spatial distribution of two fish species of small pelagics of particular interest economic: sardine, *Sardina pilchardus* and anchovy, *Engraulis*

[5] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:02006R1967-20190814&from=EN
[6] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32006R1967R(01)#ntc15-L_2007036EN.01002301-E0002
[7] https://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/6896
[8] Piano di Gestione per la pesca ai piccoli pelagici con le reti a circuizione della flottiglia siciliana (106.34 KB)

*encrasicolus*. The study area consists of the continental shelf overlooking the southern coast of Sicily. Survey design involves the acquisition of data acoustics along transepts parallel to each other and perpendicular to the coastline. The total length of the survey is approximately 700 nautical miles[9]. Since 2009, the eco-survey of the strait of Sicily has been coordinated by MEDIAS (MEDiteranean International Acoustic Survey)[10] to join and harmonize the ongoing acoustic surveys in the Mediterranean. MEDIAS (together with MEDITS) is now listed as a DCF mandatory survey. According to STECF/SGRN, the survey should give information for management decisions and provide input to assessment for stocks which are managed internationally. Under the EU Fisheries Data Collection Framework (EC 1665/2008), the Pan-Mediterranean International Acoustic Survey (MEDIAS) is conducted annually by EU Mediterranean Member States.

**Salema (*Sarpa salpa*) – 4.5% of catch profile**

No stock assessment or reference point available for this species in GSA 16. Fishbase[11] data indicate that salema has a low resilience with minimum population doubling time 4.5 - 14 years (tmax=15; tm=2; K=0.20-.027;). Based on that, we carried out the Productivity part of the PSA to determine more robustly the intrinsic resilience of the species. The results showed high productivity, as shown below. Accordingly, the species was not considered "less resilient" as per MSC GSA3.4.2.2 and is classified as a **minor secondary species**.

**Table 14.** Salema (*Sarpa salpa*) productivity attributes and scores.

| **Productivity** | | |
|---|---|---|
| Scoring element (species) | Salema (*Sarpa salpa*) – most evidence has been extracted from Fishbase' life history tool[12]). | |
| **Attribute** | Rationale | Score |
| Average age at maturity | 3 years, estimated from Lm, Linf., K and to. | **1** |
| Average maximum age | 12. 4 years | **2** |
| Fecundity | 1,048,742 (annual realised fecundity)[13] | **1** |
| Average maximum size<br>Not scored for invertebrates | 51 cm | **1** |
| Average size at maturity<br>Not scored for invertebrates | 25.3 cm | **1** |
| Reproductive strategy | nonguarders: open water/substratum egg scatterers | **1** |
| Trophic level | 2.0 estimated from diet data | **1** |
| Density dependence<br>Invertebrates only | N/A | N/A |
| Total productivity (average) score | | 1.14 |

**Round sardinella (*Sardinella aurita*) – 2.2% of catch profile**

No stock assessment or reference point available for this species in GSA 16. Fishbase[14] data indicate that round sardinella has a high resilience with minimum population doubling time less than 15 months (K=0.25-1.2; tm=1; tmax=7). This species is not considered "less resilient" as per MSC GSA3.4.2.2 and is classified as a **minor secondary species**.

[9] Allegato 4 pelagici Sicilia (211.43 KB)
[10] http://www.medias-project.eu/medias/website/
[11] https://www.fishbase.se/summary/Sarpa-salpa.html
[12] https://www.fishbase.se/popdyn/KeyfactsSummary_1.php?ID=204&GenusName=Sarpa&SpeciesName=salpa&vStockCode=218&fc=330
[13] https://www.cambridge.org/core/journals/journal-of-the-marine-biological-association-of-the-united-kingdom/article/age-growth-and-reproduction-of-the-protandrous-hermaphrodite-fish-sarpa-salpa-from-the-portuguese-continental-coast/CC01C045F89E9D0A5F31841C3AB30BFC
[14] https://www.fishbase.se/summary/sardinella-aurita

**Atlantic mackerel (*Scomber scombrus*) – 0.8% of catch profile**
No stock assessment or reference point available for this species in GSA 16. Fishbase[15] data indicate that Atlantic mackerel has a medium resilience with minimum population doubling time 1.4 - 4.4 years (rm=0.33-0.56; K=0.23-0.27; tm=2-3; tmax=17; Fec=200,000). The species has a very large distribution. This species is not considered "less resilient" as per MSC GSA3.4.2.2 and is classified as a **minor secondary species**.

**Species below the 0.5% of catch profile**
Species below the 0.5% threshold of the overall catch profile are deemed negligible catches and are not considered any further in this pre-assessment.

#### 7.5.1.1.1 ETP Species

Based on the MSC v2.01 Fisheries Standard, Endangered, Threatened or Protected (ETP) species are defined as:

1. Species that are recognised by national ETP legislation;
2. Species listed in the binding international agreements given below:
   a. Appendix 1 of the Convention on International Trade in Endangered Species (CITES), unless it can be shown that the particular stock of the CITES listed species impacted by the UoA under assessment is not endangered.
   b. Binding agreements concluded under the Convention on Migratory Species (CMS), including:
      i. Annex 1 of the Agreement on Conservation of Albatross and Petrels (ACAP);
      ii. Table 1 Column A of the African-Eurasian Migratory Waterbird Agreement (AEWA);
      iii. Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS);
      iv. Annex 1, Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS);
      v. Wadden Sea Seals Agreement;
      vi. Any other binding agreements that list relevant ETP species concluded under this Convention.
3. Species classified as 'out-of scope' (amphibians, reptiles, birds and mammals) that are listed in the IUCN Redlist as vulnerable (VU), endangered (EN) or critically endangered (CE).

**Species that are recognised by national ETP legislation**

**EU level**
The main EU legislation in force for the protection of ETP species is set out in two Directives: the "Habitats Directive" (92/43/EEC)[16] and the "Wild Birds Directive" (2009/147/EC)[17]. The species protected in these Directives are listed in Annexes which assign varying levels of protection, dependent on the conservation status of each species.

The Habitats Directive sets out protection measures for over 1,000 different animal and plant species. Annex II of the Habitats Directive lists about 900 species which require designation of Special Areas of Conservation (SACs) to protect their core areas of habitat. Whilst under Annex IV over 400 species are listed which are subject to strict protection across their entire natural range within the EU. Annex V species lists over 90 species

[15] https://www.fishbase.se/summary/Scomber-scombrus.html
[16] https://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm
[17] https://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm

for which Member States must ensure that their exploitation and taking in the wild is compatible with maintaining them in a favourable conservation status.

The Birds Directive protects all of the 500 wild bird species naturally occurring in the European Union (Article 1). It covers the protection, management and control of these species and lays down rules for their exploitation. It applies to the birds, their eggs, nests and habitats. Annex 1 lists 194 species and sub-species that are particularly threatened. Member states must designate Special Protection Areas (SPAs) for their survival and for all migratory bird species. Annex 2 specifies the 82 bird species that may be hunted and sets out restrictions on when this may occur in order to protect them when they are vulnerable; during their return migration to nesting areas, reproduction and raising of chicks. Annex 3 lists 26 species that, with certain restrictions, are excluded from the general prohibition on the deliberate killing, capture or trade or destruction of their nests.

Please refer to Table 15 for the species identified under EU Directives.

Italian legislation for the protection of ETP species.

**LAW 157/1992[18]: RULES FOR THE PROTECTION OF HOMEOTHERMAL WILDLIFE AND FOR VENATORY COLLECTION on wildlife protection (mammals and birds) and hunting limitations.**

Species which may interact geographically with the UoAs under assessment include marine mammals and seabirds as well as species already indicated by EU legislation, conventions and international agreements. Please refer to Table 15 for the species identified under such legislation.

The protection of biodiversity in the marine environment in Italy is based above all on the ratification laws of the Washington Conventions (Law No. 874 of 19 December 1975) and of the Berne Convention (Law No. 503 of 5 August 1981, amendments to Annexes I , II and III of the Convention which entered into force in Italy on 6.3.1998). Subsequently, with the Barcelona Convention (ratified by Italy with laws 30/79, 979/82, 349/86 and 394/91), the signatory countries were asked to develop specific strategies for the conservation of biological diversity and the sustainable use of Mediterranean marine resources. The Contracting Parties to the Convention and its six protocols have therefore adopted an Action Plan for the Mediterranean, the Mediterranean Action Program (MAP), oriented towards cooperation and sustainable development in the area. The protocol relating to Specially Protected Areas and biodiversity in the Mediterranean (Med SPA), ratified by Italy on 7 September 1999, provides for actions for the conservation of threatened species listed in Annex II to the protocol itself[19], shown below. We also note that the 2018 GFCM recommendation for the for the conservation of sharks and rays in the GFCM area (number GFCM/42/2018/2[20]) references the list of sharks in the following protocol. The species that may potentially interact with the fishery in question are specified below in Table 15. Species listed in the protocol that were unlikely to interact with fishery due to different geographical distribution, were not included.

**PROTOCOL 323/3/1999[21] CONCERNING SPECIALLY PROTECTED AREAS AND BIOLOGICAL DIVERSITY IN THE MEDITERRANEAN**

Relevant species protected under this protocol include fish, sharks and rays, reptiles, birds and marine mammals. Please refer to Table 15 for the species identified under this protocol.

[18] https://www.minambiente.it/sites/default/files/legge_11_02_1992_157.pdf
[19] http://www.reteribes.it/interna.asp?idPag=11
[20] http://www.fao.org/gfcm/decisions/en/
[21] https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1999:322:0003:0017:EN:PDF

**Convention on the Conservation of Migratory Species of Wild Animals (CMS or Bonn Convention, 1979).**
This Convention aims to ensure the conservation of migratory species land, sea and air throughout their distribution. Binding agreements concluded under the Convention on Migratory Species (CMS), including:

- Annex 1 of the Agreement on Conservation of Albatross and Petrels (ACAP): None of the 31 species of albatross and petrels listed in Appendix 1[22] occur in the Central or Eastern Mediterranean.

- Table 1 Column A of the African-Eurasian Migratory Waterbird Agreement (AEWA): Because not all AEWA species are relevant to the Mediterranean basin, the 2018 SPA/RAC Mediterranean List of endangered or threatened seabird species[23] was used as Mediterranean specific list of species to cross reference and isolate AEWA Table 1, Column A listed species[24]. Accordingly, the AEWA listed species that may overlap geographically and interact with the selected UoAs include the following species and populations:

1) *Larus audouinii* (Audouin's Gull) Mediterranean/N & W coasts of Africa
2) *Sternula albifrons albifrons* (Little Tern) West and East Mediterranean

- Agreement on the Conservation of Small Cetaceans of the Baltic and North Seas (ASCOBANS): Not geographically relevant to the UoA under assessment.
- Annex 1, Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS)

**ACCOBAMS**
The Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS)[25] is a legal conservation tool based on cooperation. Its purpose is to reduce threats to cetaceans notably by improving current knowledge on these animals. The Agreement Area consists of all the maritime waters of the Black Sea, the Mediterranean and the contiguous Atlantic area West of the Straits of Gibraltar. ACCOBAMS is the first Agreement binding the Countries of these sub-regions to work together for cetacean conservation. The Delphinidae species that geographical overlap with the UoAs in question are shown in **Error! Reference source not found.**.

We note that larger whales in the 2017 ACCOBAMS list[26] are considered highly unlikely to interact with the UoAs under assessment although we note that the risk of vessel collision could be a cause of injury or mortality.

- Wadden Sea Seals Agreement: Not geographically relevant to the UoAs under assessment.

- Any other binding agreements that list relevant ETP species concluded under the CMS: Species under Appendix 1 of the CMS have been included (see Table 15).

**GFCM recommendation for the for the conservation of sharks and rays in the GFCM area**

[22] https://acap.aq/acap-agreement/206-agreement-on-the-conservation-of-albatrosses-and-petrels/file
[23] http://www.rac-spa.org/node/1711
[24] https://www.unep-aewa.org/sites/default/files/instrument/agreement_text_english_final.pdf
[25] https://accobams.org/about/introduction/#:~:text=ACCOBAMS%20was%20signed%20on%20November,on%20June%201st%2C%202001.&text=ACCOBAMS%20is%20the%20first%20Agreement,work%20together%20for%20cetacean%20conservation.
[26] https://www.accobams.org/wp-content/uploads/2017/01/ACCOBAMS_Text_Agreement_English.pdf

In 2018, the GFCM recommendation for the for the conservation of sharks and rays in the GFCM area (number GFCM/42/2018/2[27]) was published, updating the previous GFCM decision GFCM/36/2012/3. The shark species that may potentially interact with the fishery in question are listed below.

**Table 15.** ETP species in the assessment area. Note, The IUCN classification uses Mediterranean stocks, as opposed to European or Global stocks of any given species, if more precise data (i.e. at the Mediterranean level) were available. RE = Regionally Extinct, CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern, DD = Data Deficient.

| **Species** | **National and EU legislation** | | | | **Agreements** | | | | **CITES App. 1** | **Red List (RE, CR, EN, VU, NT, LC, DD)** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Law 157/1992 | Protocol 323/3/1999 | EU Habitats Directive | EU Birds Directive | Bern Convention Appendix II | ACCOBAMS | CMS / Bonn Conv. App. I | AEWA | CITES App. 1 | IUCN Red List[28] | Italy Red list[29] |
| **Marine Mammals** | | | | | | | | | | | |
| Mediterranean monk seal *Monachus monachus* | X | x | Annex II | - | - | - | x | | x | EN | DD |
| Rough-toothed dolphin *Steno bredanensis* | X | x | - | - | x | x | - | - | - | LC | - |
| Risso's dolphin *Grampus griseus* | X | x | - | - | x | x | - | - | - | DD | DD |
| Bottlenose dolphin *Tursiops truncatus* | X | x | Annex II | - | x | x | x | - | - | LC | NT |
| Striped dolphin *Stenella coeruleoalba* | X | x | - | - | x | x | - | - | - | VU | LC |
| Short-beaked common dolphin *Delphinus delphis* | X | x | - | - | x | x | - | - | - | EN | EN |
| False killer whale *Pseudorca crassidens* | X | x | - | - | x | x | - | - | - | NT | - |
| Killer whale *Orcinus orca* | X | x | - | - | x | x | - | - | - | DD | - |
| Long-finned pilot whale *Globicephala melas* | X | x | - | - | x | x | - | - | - | DD | DD |
| Cuvier's beaked whale *Ziphius cavirostris* | x | x | - | - | x | x | x | - | - | DD | DD |
| Sperm whale *Physeter macrocephalus* | x | x | - | - | x | x | - | - | x | EN | EN |
| Minke whale *Balaenoptera acutorostrata* | x | x | - | - | x | x | - | - | x | LC | - |
| Humpback whale *Megaptera novaeangliae* | x | x | - | - | x | x | x | - | x | LC | - |
| **Seabirds** | | | | | | | | | | | |

[27] http://www.fao.org/gfcm/decisions/en/
[28] https://www.iucnredlist.org/
[29] https://www.minambiente.it/sites/default/files/archivio/allegati/biodiversita/lista_rossa_vertebrati_italiani.pdf

| Species | National and EU legislation | | | | Agreements | | | | CITES App. 1 | Red List (RE, CR, EN, VU, NT, LC, DD) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Law 157/1992 | Protocol 323/3/1999 | EU Habitats Directive | EU Birds Directive | Bern Convention Appendix II | ACCOBAMS | CMS / Bonn Conv. App. I | AEWA | CITES App. 1 | IUCN Red List[28] | Italy Red list[29] |
| European shag (*Phalacrocorax aristotelis*) | x | x | - | Annex 1 | x | - | - | - | - | LC | LC |
| Audouin's gull (Ichthyaetus audouinii) | x | x | - | Annex 1 | x | - | x | x | - | LC | NT |
| Mediterranean gull (*Ichthyaetus melanocephalus*) | x | - | - | Annex 1 | x | - | x | - | - | LC | LC |
| Scopoli's shearwater (*Calonectris diomedea*) | x | x | - | Annex 1 | - | - | - | - | - | LC | LC |
| Storm petrel (*Hydrobates pelagicus*) | x | x | - | Annex 1 | - | - | - | - | - | LC | NT |
| Little tern (*Sternula albifrons*) | x | x | - | Annex 1 | x | - | - | x | - | LC | EN |
| Lesser crested tern (*Thalasseus bengalensis*) | | x | - | - | - | - | - | - | - | LC | - |
| Sandwich tern (*Thalasseus sandvicensis*) | x | x | - | Annex 1 | x | - | - | - | - | LC | VU |
| Marbled duck *Marmaronetta angustirostris* | x | - | - | Annex 1 | - | - | x | - | - | VU | EN |
| Ferruginous duck *Aythya nyroca* | x | - | - | Annex 1 | - | - | x | - | - | LC | EN |
| **Fish, sharks and rays** | | | | | | | | | | | |
| European sturgeon *acipenser sturio* | x | x | Annex II | - | x | - | x | - | x | CR | RE |
| Basking shark *Cetorhinus maximus* | x | x | - | - | x | - | x | - | - | EN | DD |
| Great white shark *Carcharodon Carcharias* | x | x | - | - | x | - | x | - | - | CR | DD |
| Giant devil ray (*Mobula mobular*) | x | x | | | x | - | x | - | - | EN | EN |
| Oceanic Whitetip Shark *Carcharhinus longimanus* | x | - | - | - | - | - | x | - | - | EN | - |
| Angelshark *squatina squatina* | x | - | - | - | - | - | x | | - | CR | CR |
| Common Guitarfish *Rhinobatos rhinobatos* | x | - | - | - | - | - | x | - | - | EN | CR |
| Shortfin Mako *Isurus oxyrinchus* | x | - | - | - | - | - | - | - | - | CR | DD |
| Porbeagle *Lamna nasus* | x | - | - | - | - | - | - | - | - | CR | DD |
| Smooth Hammerhead *Sphyrna zygaena* | x | - | - | - | - | - | - | - | - | CR | DD |
| Angular Rough Shark *Oxynotus centrina* | x | - | - | - | - | - | - | - | - | CR | DD |

| Species | National and EU legislation | | | | Agreements | | | | CITES App. 1 | Red List (RE, CR, EN, VU, NT, LC, DD) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Law 157/1992 | Protocol 323/3/1999 | EU Habitats Directive | EU Birds Directive | Bern Convention Appendix II | ACCOBAMS | CMS / Bonn Conv. App. I | AEWA | CITES App. 1 | IUCN Red List[28] | Italy Red list[29] |
| Sawback Angelshark *Squatina aculeata* | x | - | - | - | - | - | - | - | - | CR | CR |
| Smoothback Angelshark *Squatina oculata* | x | - | - | - | - | - | - | - | - | CR | CR |
| Sandy Skate *Leucoraja circularis* | x | - | - | - | - | - | - | - | - | CR | DD |
| Maltese Skate *Leucoraja melitensis* | x | - | - | - | - | - | - | - | - | CR | NT |
| Common Skate complex *Dipturus batis* spp | x | - | - | - | - | - | - | - | - | CR | DD |
| Spiny Butterfly Ray *Gymnura altavela* | x | - | - | - | - | - | - | - | - | CR | DD |
| Smalltooth Sawfish *Pristis pectinata* | x | - | - | - | - | - | - | - | x | CR | - |
| Common Sawfish *Pristis pristis* | x | - | - | - | - | - | x | | x | CR | - |
| Sand Tiger *Carcharias taurus* | x | - | - | - | - | - | - | - | - | CR | DD |
| Smalltooth Sand Tiger *Odontaspis ferox* | x | - | - | - | - | - | - | - | - | CR | DD |
| White Skate *Rostroraja alba* | x | - | - | - | - | - | - | - | - | EN | CR |
| Blackchin Guitarfish *Rhinobatos cemiculus* | x | - | - | - | - | - | - | - | - | CR | CR |
| Scalloped Hammerhead *Sphyrna lewini* | x | - | - | - | - | - | - | - | - | DD | - |
| Great Hammerhead *Sphyrna mokarran* | x | - | - | - | - | - | - | - | - | DD | - |
| Tope Shark *Galeorhinus galeus* | x | - | - | - | - | - | - | - | - | VU | CR |
| **Turtles** | | | | | | | | | | | |
| Loggerhead sea turtle (*Caretta caretta*) | x | x | Annex II | - | x | - | x | - | - | VU | EN |
| green sea turtle (*Chelonia mydas*) | x | x | Annex II | - | x | - | x | - | x | EN | - |
| leatherback sea turtle (*Dermochelys coriacea*) | x | x | Annex IV | - | x | - | x | - | x | VU | - |
| hawksbill sea turtle (*Eretmochelys imbricata*) | x | x | Annex IV | - | x | - | x | - | - | CR | - |

## Bycatch of Vulnerable or ETP Species

The 2018 State of Mediterranean and Black Sea Fisheries (SoMFi) report[30], defines incidental catch of vulnerable species as a subset of bycatch which includes species that, for some reason, are considered vulnerable (i.e. long-lived vertebrates with low reproductive rates such as marine mammals, but also sea turtles, seabirds and elasmobranchs). The SOMFI report also highlights that data on incidental catch of vulnerable species are widely reported in most Mediterranean countries (as strandings and interviews), but there are no systematic monitoring and data collection systems: monitoring programmes are lacking for many fishing gear, countries or/and subregions, and most of the existing studies only cover small spatial scales. Therefore, the collection of data (e.g. number, size, areas, fishing gear) on the incidental catch of vulnerable species is key to understanding the nature and extent of the issue and can be considered as a first step toward developing and implementing adequate management measures aimed at reducing interactions.

The 2018 SOMFI report continues to say that based on a literature review in Mediterranean waters, concerning the information by vessel group, longliners are responsible for most of the incidental catches of vulnerable species in all subregions; sea turtles, elasmobranchs and seabirds account for most of the incidental captures for this vessel group. The incidental catches of these groups of species are reported especially in the western and central basins where the fishing activity is more intense and where the monitoring measures are more constant and effective. Trawlers (pelagic and demersal) are the vessel group for which most information is reported regarding the incidental catch of marine mammals (both in the central Mediterranean and the Adriatic Sea) and elasmobranchs (in the Adriatic Sea).

Because the purse seine fishery in GSA 16 is carried out with lights (i.e. called lampara) at night, the likelihood of encountering or indeed capturing seabirds is probably very limited since most seabirds feed during daylight hours [31] [32] . Furthermore, the SOMFI 2018 report does not mention risk to turtles or sharks from purse seine gear. Instead, gillnet, trammel net, longline and bottom trawl fisheries are considered a major threat for the survival of sharks and ray populations in the Mediterranean and the Black Sea, while the most incidental catches of marine turtles occur in fisheries using longlines, bottom and pelagic trawlers as well as gillnets.

Dolphins were mentioned as a species with some risk of interaction with the fishery. In this regard, the industry representative interviewed reported that fishermen are very careful about releasing the net or backing away from any dolphin that may get close to the nets during fishing operations to avoid issues. Dolphins are known to damage gear and scare off and scatter anchovies and as such may ruin a fishing trip. However, the risk to these animals is considered low and even if they were to get caught in the net, they would reportedly be let go by lowering and raising the net, or released alive in the case of capture. The very low risk of bycatch and mortality to dolphins was confirmed uniformly by interview with GFCM staff, a fishermen representative and a researcher from the CNR. Short-beaked common dolphin *Delphinus delphis* was selected as a scoring element in the ETP species Performance Indicator tables.

#### 7.5.1.1.2 Habitat

The following section on habitat has been taken from the MSC BluFish Deeper Mapping report for GSA 16.

The Strait of Sicily is characterized by the presence of a high variety of benthic communities along the continental shelf. Recent studies have identified different benthic biocenoses: SFBC (fine-calibrated fine sand), HP (Posidonia oceanica), VTC (coastal terrigenous mud), C (coralligenous), DC (Coastal detritus), DL (debris of

[30] http://www.fao.org/gfcm/publications/somfi/2018/en/

[31] https://www.bmis-bycatch.org/system/files/zotero_attachments/library_1/PP4C97NZ%20-%20Baker%20and%20Hamilton%20-%20Impacts%20of%20purse-seine%20fishing%20on%20seabirds%20and%20app.pdf

[32] https://www.sciencedirect.com/science/article/abs/pii/S000632072030700X

the open sea), RL (Rocks) of the wide), VB-VSG (sand and mud with gravel), VB-C (compact mud), VB-PSF, (soft mud).

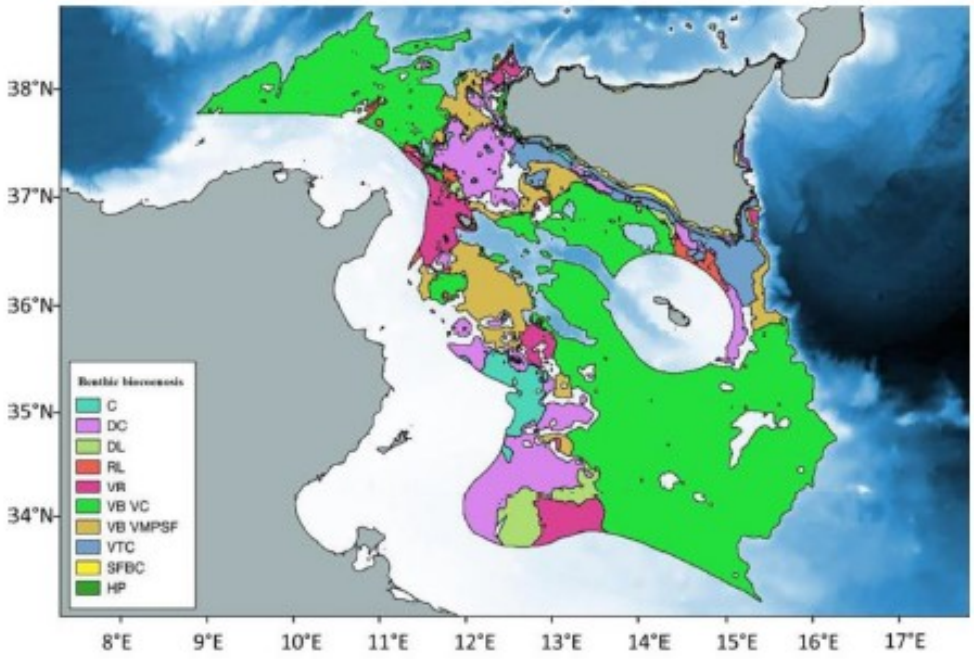



**Figure 13.** Biocenosis of the strait of Sicily (MIPAAFT, 2017).

Furthermore, in accordance with the Convention on Biological Diversity (CHM, 2017), the Sicilian Channel is part of one of the significant areas EBSA (Ecologically or Biologically Significant Areas) of the Mediterranean. In this area, there is an exchange of water masses and organisms between the western and eastern Mediterranean basins that determines a biodiversity hotspot. Submarine mountains and deep-water corals are found near Sicily, including communities of white corals, which are vulnerable species and provide a valuable habitat for a number of other species.

**Distribution of marine seagrasses**

In the Sicilian channel there are a number of seagrass species that include *Cymodocea nodosa*, the *Ruppia maritima* and the *Posidonia oceanica* on almost the entire coast of the island, as shown in the map in the Figure below.

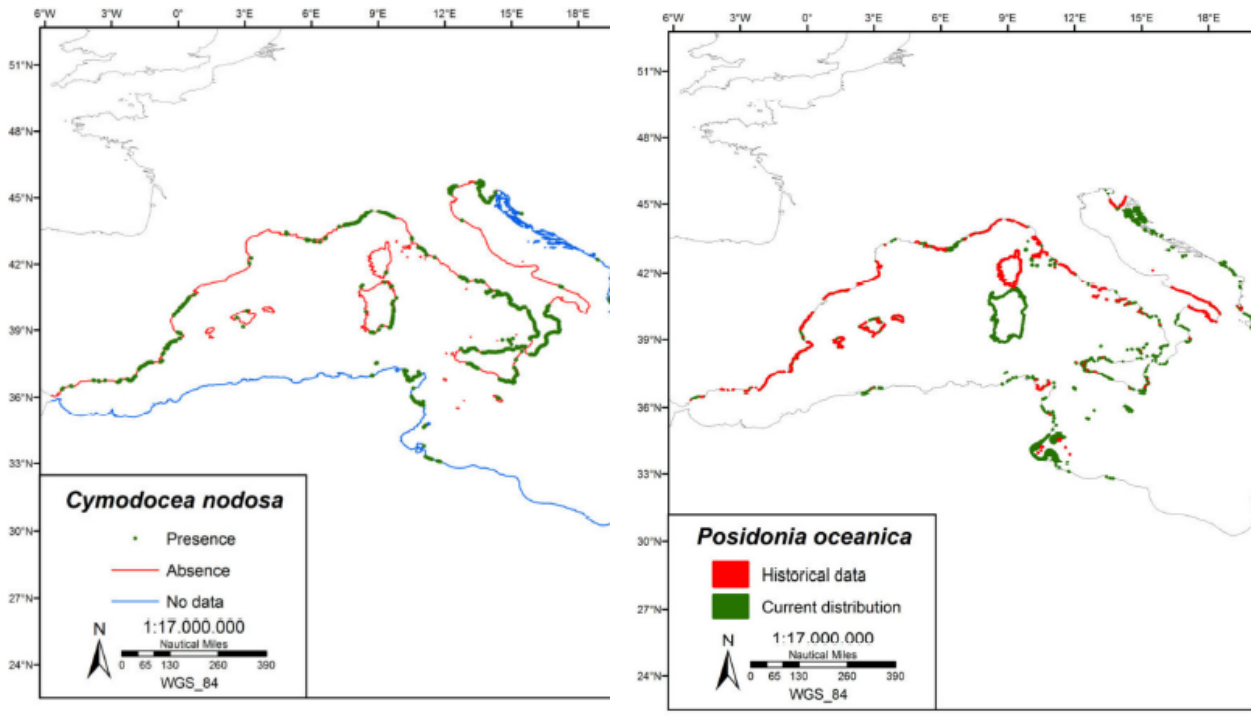



**Figure 14.** Presence of *Cymodocea nodosa* and *Posidonia oceanica* around the Sicilian coast.

**Distribution of coralligenous**

In the Sicily channel some information on the distribution of coralligenous is available from several studies. For Sicily and Malta, all available information on the location of the mäerl habitats is provided in the map below.

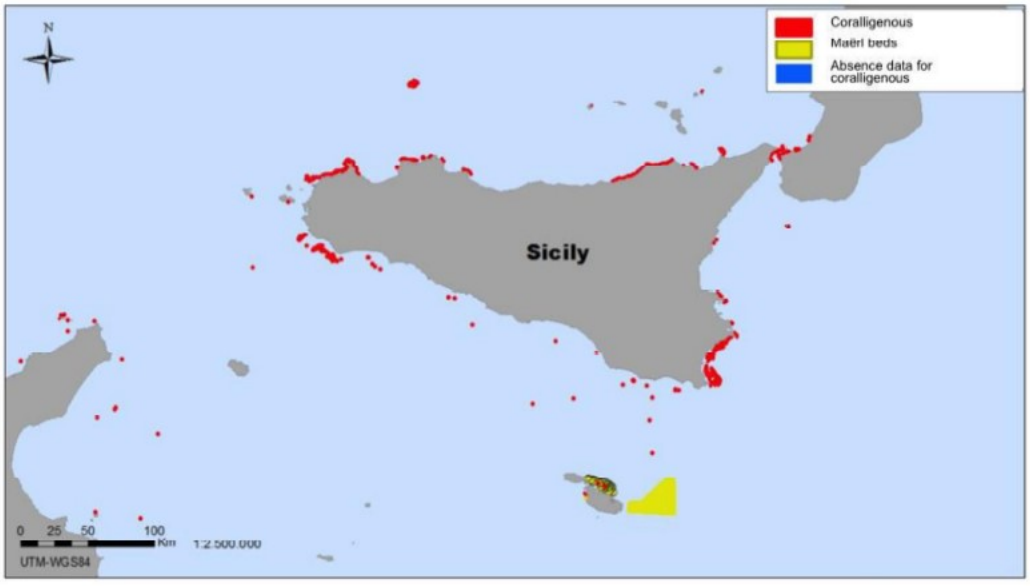



**Figure 15.** Map of the distribution of coralligenous bottoms along the Sicilian coasts (Giannoulaki et al., 2013).

**Limited to no impacts from purse seine gear**

The fishery uses purse seine gear. This gear operates with two boats per net. The main boat remains stationary while a much smaller boat encircles the fish with a long net that has floats on top. Once the net is in place, the

purse line is pulled to close the bottom of the net and capture the fish, which are then hauled aboard the larger vessel. Purse seines are generally used to catch small or large pelagic species, and do not tend to have any contact with seafloor structures and benthic organisms. The overall risk to benthic habitat and species is deemed low[33] to negligible for this gear type. The very low risk of gear contact with the seabed or habitat types was confirmed by interview with a fishermen representative and a researcher from the CNR.

Furthermore, fishing with purse seines, boat seines, shore seines or similar nets above seagrass beds of, in particular, *Posidonia oceanica* or other marine phanerogams is prohibited, unless they do not physically touch the seabed[34].

**Commonly Encountered Habitats, minor habitat and VMEs**
Based on available data and as reflecting MSC standard requirements we define here:

- **Commonly encountered habitats** as the water column since this gear does not come into contact with the seabed.
- No **minor habitats** have been identified.
- **VMEs** were identified as marine seagrasses and coralligenous communities.

#### 7.5.1.1.3 Ecosystem

A holistic food web model (quantitative Ecopath with Ecosim model; Agnetta et al., 2019)[35] has been developed in the Strait of Sicily in order to understand the interplay between the benthic pelagic coupling and mixed fisheries in a Mediterranean system. The study area of the food web model coincides with the northern side of the Strait of Sicily, which stretches off the southern Sicily coast and is characterized in its central portion by a narrow continental shelf that separates two wider portions of shelf coinciding with the Adventure Bank in the west and the Malta Bank in the east.

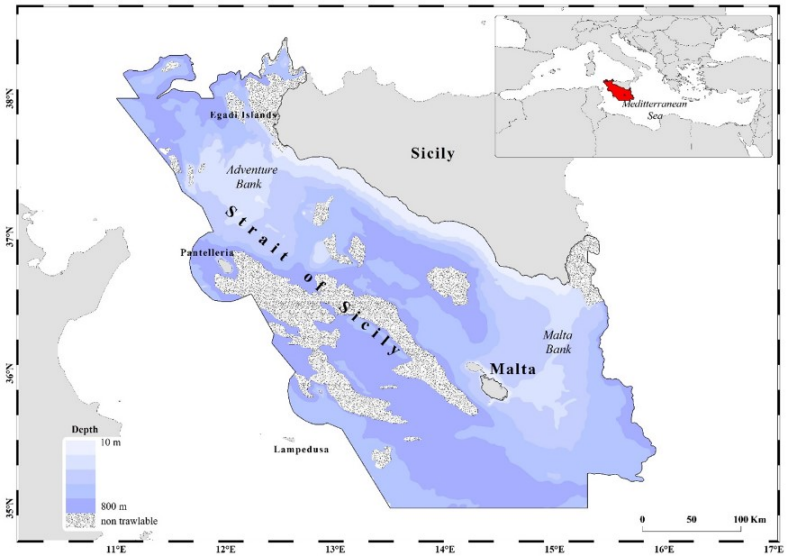



**Figure 16.** Area of the Agnetta et al., 2019 food web model (about 61,000 km2) applied to the Strait of Sicily.

[33] https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/1540-9295%282003%29001%5B0517%3ASGACIO%5D2.0.CO%3B2
[34] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006R1967&rid=1
[35] https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0210659

The study area has a complex bottom morphology due to the presence of sedimentary and volcanic seamounts that influences the hydrology in the region. The shape of the slope is extremely irregular, incised by several trenches and steep areas. Sea water circulation achieves a two-layer exchange, with an inflow of the Atlantic Ionian Stream flowing eastwards (0–150 m depth) and an undercurrent composed mainly of Levantine Intermediate Water flowing in the opposite direction. Persistent cyclonic vortices around the Adventure and Malta Banks produce upwelling at their center to counterbalance the divergence of surface water, whereas frequent wind-induced upwelling events boost primary production in coastal zones. Stable environmental conditions identified around the two banks highly contribute to sustain spawning and nursery areas of commercial species and hot-spots of biodiversity.

The reconstruction of the food web required review and integration of a vast set of local and regional biological information from bacteria to large pelagic species that were aggregated into 72 functional groups. Fisheries were described by 18 fleet segments resulting from combination of fishing gears and fishing vessel size. Input data included biological and diet data, as well as MEDITS survey relative abundance for most species, and acoustic survey information for anchovy and sardine.

According to the model outputs, the bulk of consumption fluxes (~95%, 1500 t km-2 years-1) was exchanged by lower “taxonomic” groups (i.e. macro-benthos, zooplankton, euphausiids and bacteria) across the benthic and pelagic domains. The remaining consumption flux (~ 5%) was determined by all other functional groups, with epipelagic fish (EPI) and mesopelagic fish crustacean feeders (MSC) having the most relevant flows for benthic-pelagic coupling both as consumers and sources. Many other functional groups FGs (e.g., horse mackerel *Trachurus* spp., TRA and sardine, SAR), contributed to a less extent to the consumption fluxes linked to BPC although they had high biomass and were predators and preys across benthic and pelagic domains as well. These linkages are shown below.

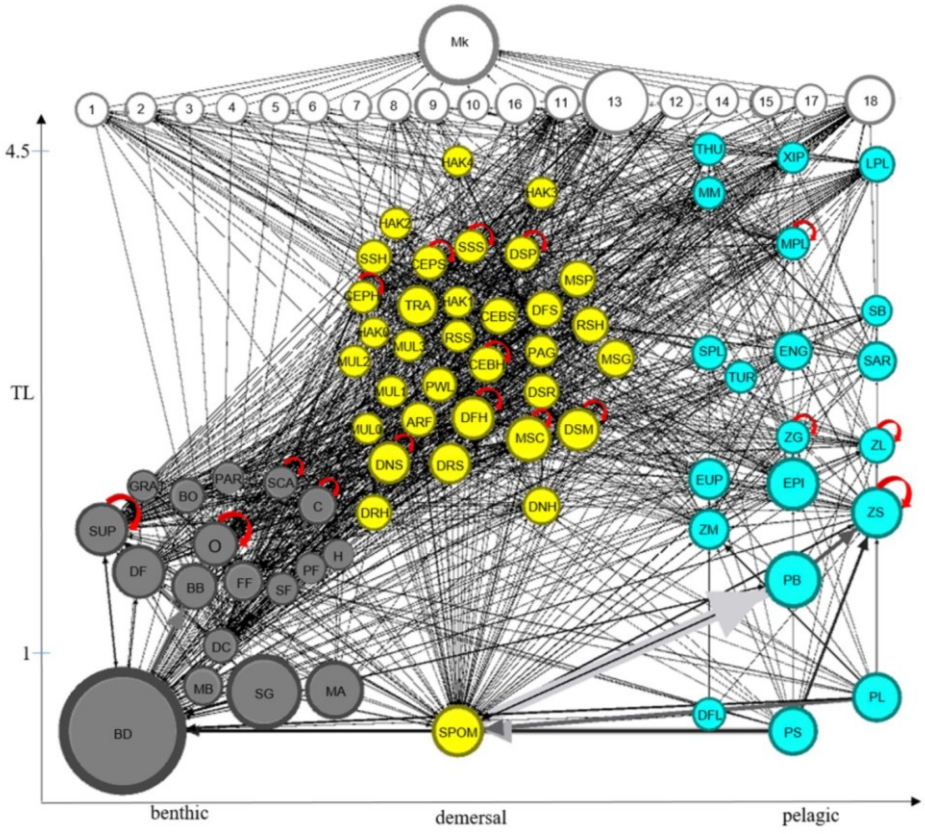



**Figure 17 -** Flow diagram of the food web. Functional groups (nodes) by trophic levels (TL, y-axis) and by benthic (gray), demersal (yellow) and pelagic (cyan) domains (x-axis). White nodes represent fishing activities

and the market (Mk). Links width are proportional to flow intensity, i.e., to annual food consumption rates for FG (>5^-6 t km−2 year−1), to catches for fleets and to landings for the market. Node radius is proportional to the square root of FG biomass, total catch of fleets and total landings for the market. Gray arrows indicate higher fluxes. Red arrows are loops (cannibalism). European anchovy = ENG Source: Agnetta et al., 2019.

In the benthic domain, groups with high εi (overall cumulative impact produced by a component) were suprabenthos (SUP), macrobenthos carnivore (C), omnivore (O), scavenger (SCA) and detritus feeder (DF); in the demersal domain, high εi values were shown by demersal fish from slope (DFS), TRA, MSC, rays from shelf (RSH), sharks from slope (SSS) and decapods natant from the slope (DNS). Finally, in the pelagic domain, large pelagic fish (LPL), euphausiids (EUP), European anchovy (ENG), zooplankton medium (ZM) and small (ZS) were the groups with highest εi. These linkages are shown in Figure 17.

The Agnetta study also highlighted fisheries impacts on different ecosystem elements. Bottom trawlers of LOA class 2 and 3 had negative direct impact on main target demersal species such as large European hake (HAK3 and 4), red mullet (MUL3), rays and sharks (RSH and RSS), but had positive effects on hake and red mullet juvenile (HAK1 and 2; MUL0 and 1). Moreover, these fisheries had negative indirect impact on benthic organisms such as benthic decapods (mainly DNH, DRH) mediated by the depletion of their predators. Similarly, longliners and purse-seiners had negative effects on their main pelagic targets, i.e., the large pelagic (swordfish (XIP), tuna (THU), large pelagics (LPL)) but also and indirect positive effect on several demersal species such as TRA, mesopelagic fish jellyfish feeders (MSG), mesopelagic piscivorous fish (MSP) and notably, HAK3 and HAK4. Interestingly purse-seiners have negative impact on jellyfish (ZG) which is not among their target species. HAK and TRA were bycatch species of pelagic pair trawlers (PTM) and midwater-mixed trawlers (OTM) and were indirectly favored by purse-seiners (LOA1 and 2) through the benthic—pelagic coupling (BPC).

#### 7.5.1.2 P2 References


| | |
|---|---|
| ACAP. 2020. Annex 1 of the Agreement on Conservation of Albatross and Petrels (ACAP). | https://www.acap.aq/ |
| ACCOBAMS. 2017. Accobams list of marine mammals. Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS) | https://www.accobams.org/wp-content/uploads/2017/01/ACCOBAMS_Text_Agreement_English.pdf |
| ACCOBAMS. 2020. Introduction to the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS) | https://accobams.org/about/introduction/#:~:text=ACCOBAMS%20was%20signed%20on%20November,on%20June%201st%2C%202001.&text=ACCOBAMS%20is%20the%20first%20Agreement,work%20together%20for%20cetacean%20conservation. |
| ACCOBAMS. 2020. Meeting of the Parties. Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area | https://accobams.org/category/meetings/meetings-of-the-parties/ |
| AEWA. 2018. Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA), as agreed by MOP7. | https://www.unep-aewa.org/sites/default/files/instrument/agreement_text_english_final.pdf |
| Agnetta D, Badalamenti F, Colloca F, D'Anna G, Di Lorenzo M, Fiorentino F, et al. (2019) Benthic-pelagic coupling mediates interactions in Mediterranean mixed fisheries: An ecosystem modeling approach. PLoS ONE 14(1): e0210659. https://doi.org/10.1371/journal.pone.0210659 | https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0210659 |

Baker, B., Hamilton, S. 2016. Impacts of purse-seine fishing on seabirds and approaches to mitigate bycatch. Seventh Meeting of the Seabird Bycatch Working Group La Serena, Chile, 2 - 4 May 2016. https://www.bmis-bycatch.org/system/files/zotero_attachments/library_1/PP4C97NZ%20-%20Baker%20and%20Hamilton%20-%20Impacts%20of%20purse-seine%20fishing%20on%20seabirds%20and%20app.pdf

Bearzi G., Notarbartolo di Sciara G., Reeves R.R., Cañadas A., Frantzis A. 2004. Conservation Plan for shortbeaked common dolphins in the Mediterranean Sea. ACCOBAMS, Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area. 90 pp. https://www.accobams.org/wp-content/uploads/2016/07/Conservation-Plan-for-Delphinus-delphis.pdf

Bearzi, G. 2012. Delphinus delphis. The IUCN Red List of Threatened Species 2012: e.T6336A16236707. Downloaded on 09 February 2021. https://www.iucnredlist.org/species/6336/16236707#population

Chuenpagdee, R., Morgan, L.E., Maxwell, S.M., Norse, E.A. and Pauly, D. (2003), Shifting gears: assessing collateral impacts of fishing methods in US waters. Frontiers in Ecology and the Environment, 1: 517-524. https://doi.org/10.1890/1540-9295(2003)001[0517:SGACIO]2.0.CO;2 https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/1540-9295%282003%29001%5B0517%3ASGACIO%5D2.0.CO%3B2

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora https://ec.europa.eu/environment/nature/legislation/habitatsdirective/index_en.htm

De Pierrepont, J.F., B. Dubois, S. Desormonts, M.B. Santos and J.P. Robin 2005 Stomach contents of English Channel cetaceans stranded on the coast of Normandy. J. Mar. Biol. Ass. U.K. 85:1539-1546. https://www.sealifebase.ca/trophiceco/DietCompoSummary.php?dietcode=636&genusname=Delphinus&speciesname=delphis

Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds https://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm

EC. 2007. Corrigendum to Council Regulation (EC) No 1967/2006 of 21 December 2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea, amending Regulation (EEC) No 2847/93 and repealing Regulation (EC) No 1626/94 ( OJ L 409, 30.12.2006 ). European Commission. https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32006R1967R(01)#ntc15-L_2007036EN.01002301-E0002

EC. COUNCIL REGULATION (EC) No 1967/2006 of 21 December 2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea, amending Regulation (EEC) No 2847/93 and repealing Regulation (EC) No 1626/94. (OJ L 409 30.12.2006, p. 11). European Commission https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:02006R1967-20190814&from=EN

EC.2015. 2014 National Programme. European Commission. https://datacollection.jrc.ec.europa.eu/np/2014/-/document_library_display/z9Yv/view/688307?_110_INSTANCE_z9Yv_topLink=home&_110_INSTANCE_z9Yv_delta2=20&_110_INSTANCE_z9Yv_keywords=&_110_INSTANCE_z9Yv_advancedSearch=false&_110_INSTANCE_z9Yv_andOperator=true&p_r_p_564233524_resetCur=false&_110_INSTANCE_z9Yv_cur2=2

Fishbase. 2020. Sardinella aurita Valenciennes, 1847 Round sardinella. https://www.fishbase.se/summary/sardinella-aurita

Fishbase. 2020. Sarpa salpa (Linnaeus, 1758) Salema https://www.fishbase.se/summary/Sarpa-salpa.html

Fishbase. 2020. Sarpa salpa (Linnaeus, 1758) Salema - life history tool. https://www.fishbase.se/popdyn/KeyfactsSummary_1.php?ID=204&GenusName=Sarpa&SpeciesName=salpa&vStockCode=218&fc=330

Fishbase. 2020. Scomber scombrus Linnaeus, 1758 Atlantic mackerel. https://www.fishbase.se/summary/Scomber-scombrus.html

GFCM. 2018. Recommendation GFCM/42/2018/2 on fisheries management measures for the conservation of sharks and rays in the GFCM area of application, amending Recommendation GFCM/36/2012/3. http://www.fao.org/gfcm/decisions/en/

GFCM. 2018. SoMFi 2018. General Fisheries Commission for the Mediterranean - GFCM http://www.fao.org/gfcm/publications/somfi/2018/en/

GFCM. 2019. Working Group on Stock Assessment of Small Pelagic Species (WGSASP). General Fisheries Commission for the Mediterranean http://www.fao.org/gfcm/technical-meetings/detail/en/c/1274635/

GFCM. 2020. GFCM recommendations and resolutions. General Fisheries Commission for the Mediterranean - GFCM http://www.fao.org/gfcm/decisions/en/

Giannoulaki M., Iglesias M., Tugores M.P., Bonanno A., Patti B., De Felice A., et al. 2013. Characterizing the potential habitat of European anchovy Engraulis encrasicolus in the Mediterranean Sea, at different life stages. Fisheries Oceanography, 22 (2013), pp. 69-89, 10.1111/fog.12005 https://www.sciencedirect.com/science/article/pii/S2352485520307349#b22

Jiménez, S., Domingo, A., Winker, H., Parker, D., Gianuca, D., Neves, T., Coelho, R., & Kerwath, S. 2020. Towards mitigation of seabird bycatch: Large-scale effectiveness of night setting and Tori lines across multiple pelagic longline fleets. Biological Conservation, 247, 108642. https://www.sciencedirect.com/science/article/abs/pii/S000632072030700X

MEDIAS. 2020. MEDiteranean International Acoustic Survey homepage. http://www.medias-project.eu/medias/website/

Minambiente. Legge 157/1992 : Norme per la protezione della fauna selvatica omeoterma e per il prelievo venatorio. https://www.minambiente.it/sites/default/files/legge_11_02_1992_157.pdf

MIPAAF. 2011. Adozione dei piani nazionali di gestione della flotta. Ministero delle politiche agricole alimentari e forestali https://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/6896

MIPAAF. 2011. Piano di Gestione per la pesca ai piccoli pelagici con le reti a circuizione della flottiglia siciliana (ex art.24 del Reg. (CE) n.1198/2006 e art.19 del Reg. (CE) n.1967/2006). https://webcache.googleusercontent.com/search?q=cache:OXOjZBB5z5wJ:https://www.politicheagricole.it/flex/cm/pages/ServeAttachment.php/L/IT/D/4%25252Fe%25252Fb%25252FD.cfa0001a323ee507c000/P/BLOB%253AID%253D6896/E/pdf+&cd=2&hl=en&ct=clnk&gl=ie

MIPAAF. 2011. Piano di Gestione per la pesca ai piccoli pelagici con le reti a circuizione della flottiglia siciliana. Allegato 4 pelagici Sicilia. Ministero delle politiche agricole alimentari e forestali https://www.politicheagricole.it/flex/cm/pages/ServeAttachment.php/L/IT/D/9%252Fd%252Fe%252FD.321129f2739a3b7b8ff4/P/BLOB%3AID%3D6896/E/pdf

MIPAAF. 2011. Piano di Gestione per la pesca ai piccoli pelagici con le reti a circuizione della flottiglia siciliana. Ministero delle politiche agricole alimentari e forestali https://www.politicheagricole.it/flex/cm/pages/ServeAttachment.php/L/IT/D/4%252Fe%252Fb%252FD.cfa0001a323ee507c000/P/BLOB%3AID%3D6896/E/pdf

MSC. 2019. BLUFISH PROJECT Stage 1.b – Deeper mapping/Annex III Southern Sicily (GSA 16). Marine stewardship Council Italy. https://www.msc.org/docs/default-source/it-files/d_deeper-mapping_annex-iii_eng.pdf?sfvrsn=53e2bb7_0

Mussi, B, Vivaldi, C, Zucchini, A, Miragliuolo, A, Pace, DS. 2019. The decline of short-beaked common dolphin (Delphinus delphis) in the waters off the island of Ischia (Gulf of Naples, Italy). Aquatic Conserv: Mar Freshw Ecosyst. 1– 14. https://doi.org/10.1002/aqc.3061 https://onlinelibrary.wiley.com/doi/full/10.1002/aqc.3061

Official Journal of the European Communities. 1999. PROTOCOL CONCERNING SPECIALLY PROTECTED AREAS AND BIOLOGICAL DIVERSITY IN THE MEDITERRANEAN. L 322/3 https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:1999:322:0003:0017:EN:PDF

Paiva, R., Neves, A., Sequeira, V., Vieira, A., Costa, M., & Gordo, L. 2018. Age, growth and reproduction of the protandrous hermaphrodite fish, Sarpa salpa, from the Portuguese continental coast. Journal of the Marine Biological Association of the United Kingdom, 98(2), 269-281. doi:10.1017/S0025315416001405 https://www.cambridge.org/core/journals/journal-of-the-marine-biological-association-of-the-united-kingdom/article/abs/age-growth-and-reproduction-of-the-protandrous-hermaphrodite-fish-sarpa-salpa-from-the-portuguese-continental-coast/CC01C045F89E9D0A5F31841C3AB30BFC

Reteribes. 2020. Normativa Italiana (biodiversita'). Rete italiana Banche del Germoplasma. http://www.reteribes.it/interna.asp?idPag=11

Rondinini, C., Battistoni, A., Peronaca,. Teofili, C. (compilatori). 2013. Lista Rossa IUCN dei Vertebrati Italiani. Comitato Italiano IUCN e Ministero dell'Ambiente e della Tutela del Territorio e del Mare, Roma. https://www.minambiente.it/sites/default/files/archivio/allegati/biodiversita/lista_rossa_vertebrati_italiani.pdf

Sealifebase. 2020. Delphinus delphis Linnaeus, 1758 common dolphin https://www.sealifebase.ca/summary/Delphinus-delphis.html

Silva, M. 1999 Diet of common dolphins, Delphinus delphis, off the Portuguese continental coast. Journal of the Marine Biological Association of the United Kingdom 79:531-540. https://www.sealifebase.ca/trophiceco/DietCompoSummary.php?dietcode=207&genusname=Delphinus&speciesname=delphis

SPA/RAC. 2018. Mediterranean List of endangered or threatened species. Specially Protected Areas Regional Activity Centre. http://www.rac-spa.org/node/1711

### 7.5.2 Principle 2 Performance Indicator scores and rationales

## PI 2.1.1 – Primary species outcome

| PI 2.1.1 | | The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | **Main primary species stock status** | | | |
| | Guide post | Main primary species are **likely** to be above the PRI.<br>OR<br>If the species is below the PRI, the UoA has measures in place that are **expected** to ensure that the UoA does not hinder recovery and rebuilding. | Main primary species are **highly likely** to be above the PRI.<br>OR<br>If the species is below the PRI, there is either **evidence of recovery** or a demonstrably effective strategy in place **between all MSC UoAs which categorise this species as main**, to ensure that they collectively do not hinder recovery and rebuilding. | There is a **high degree of certainty** that main primary species are above the PRI **and are** fluctuating around a level consistent with MSY. |
| | Met? | NA | NA | NA |
| Rationale | | | | |
| There are no main primary species in the UoA in question. As per MSC interpretation (https://mscportal.force.com/interpret/s/article/P2-species-outcome-PIs-scoring-when-no-main-or-no-minor-or-both-PI-2-1-1-1527262009344) if the fishery has no main primary species, scoring issue (a) is not applicable. | | | | |
| **b** | **Minor primary species stock status** | | | |
| | Guide post | | | Minor primary species are highly likely to be above the PRI.<br>OR<br>If below the PRI, there is evidence that the UoA does not hinder the recovery and rebuilding of minor primary species. |
| | Met? | | | NA |
| Rationale | | | | |
| There are no minor primary species in the UoA in question, and scoring issue (b) is not applicable.<br><br>**As per MSC Clause SA3.2.1: If a team determines that a UoA has no impact on a particular component, it shall receive a score of 100 under the Outcome PI.** | | | | |
| References | | | | |
| Refer to P2 background information | | | | |

| PI 2.1.1 | The UoA aims to maintain primary species above the point where recruitment would be impaired (PRI) and does not hinder recovery of primary species if they are below the PRI |
|---|---|
| Overall Performance Indicator (PI) Rationale | |
| Rationale is provided for each Scoring Issue. | |
| Draft scoring range | ≥80 |
| Information gap indicator | Information sufficient to score PI |
| Data-deficient? (Risk-Based Framework needed) | No |

## PI 2.1.2 – Primary species management strategy

| PI 2.1.2 | | There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | Management strategy in place | | | |
| | Guide post | There are **measures** in place for the UoA, if necessary, that are expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are likely to be above the PRI. | There is a **partial strategy** in place for the UoA, if necessary, that is expected to maintain or to not hinder rebuilding of the main primary species at/to levels which are highly likely to be above the PRI. | There is a **strategy** in place for the UoA for managing main and minor primary species. |
| | Met? | Yes | Yes | No |
| Rationale | | | | |
| In the context of this PI (MSC FCP v2.1; Table SA8: Principle 2 Phrases):<br>*A **"strategy"** represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and which should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery and should contain mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts.*<br><br>The UoA does not have any primary species in their catch profile and **SG 60 and 80** are met by default. However (and considering uncertainties and gear loss or other accidents that may occur as per MSC SA3.5.1), we cannot determine with certainty that there is a strategy in place for the UoA for managing main and minor primary species in the UoA should the need arise in the future (e.g. in the case sardine becomes formally managed with reference points). SG 100 is not met. | | | | |
| **b** | Management strategy evaluation | | | |
| | Guide post | The measures are considered **likely** to work, based on plausible argument (e.g., general experience, theory or comparison with similar fisheries/species). | There is some **objective basis for confidence** that the measures/partial strategy will work, based on some information directly about the fishery and/or species involved. | **Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved. |
| | Met? | Yes | Yes | No |
| Rationale | | | | |
| The UoA does not have any primary species in their catch profile and **SG 60 and 80 are met** by default[36]. However (and considering uncertainties and gear loss or other accidents that may occur as per MSC SA3.5.1), we cannot determine with certainty that there has been "testing" that supports with high confidence that the partial strategy/strategy will work, based on information directly about the fishery and/or species involved. SG 100 is not met. | | | | |

[36] https://mscportal.force.com/interpret/s/article/Use-of-if-necessary-in-P2-management-PIs-2-1-2-2-2-2-2-4-2-2-5-2-PI-2-1-2-1527262011402

| PI 2.1.2 | | There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch | | |
|---|---|---|---|---|
| | | | | |
| **c** | Management strategy implementation | | | |
| | Guide post | | There is **some evidence** that the measures/partial strategy is being **implemented successfully**. | There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a). |
| | Met? | | Yes | No |
| Rationale | | | | |
| The UoA does not have any primary species in their catch profile and **SG 80 is met** by default . However (and considering uncertainties and gear loss or other accidents that may occur as per MSC SA3.5.1), we cannot determine with certainty that there is clear evidence that a partial strategy/strategy is being implemented successfully and is achieving its overall objective as set out in scoring issue (a). SG 100 is not likely met. | | | | |
| **d** | Shark finning | | | |
| | Guide post | It is **likely** that shark finning is not taking place. | It is **highly likely** that shark finning is not taking place. | There is a **high degree of certainty** that shark finning is not taking place. |
| | Met? | NA | NA | NA |
| Rationale | | | | |
| According to MSC, this Scoring Issue need not be scored if sharks are not a primary species. This scoring issue is not applicable. | | | | |
| **e** | Review of alternative measures | | | |
| | Guide post | There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species. | There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of main primary species and they are implemented as appropriate. | There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and they are implemented, as appropriate. |
| | Met? | Yes | Yes | No |
| Rationale | | | | |
| The UoA does not have any primary species in their catch profile and **SG 60 and 80 are met** by default. However (and considering uncertainties and gear loss or other accidents that may occur as per MSC SA3.5.1), we cannot determine with certainty that there is a biennial review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of unwanted catch of all primary species, and implementation, as appropriate. SG 100 is likely not met. | | | | |
| References | | | | |

| PI 2.1.2 | There is a strategy in place that is designed to maintain or to not hinder rebuilding of primary species, and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch |
|---|---|
| Refer to P2 background information. | |
| Overall Performance Indicator (PI) Rationale | |
| Rationale is provided for each Scoring Issue. | |
| Draft scoring range | ≥80 |
| Information gap indicator | Information sufficient to score PI |

## PI 2.1.3 – Primary species information

| PI 2.1.3 | | Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | **Information adequacy for assessment of impact on main primary species** | | | |
| | Guide post | Qualitative information is **adequate to estimate** the impact of the UoA on the main primary species with respect to status.<br>~~OR~~<br>~~If RBF is used to score PI 2.1.1 for the UoA:~~<br>~~Qualitative information is adequate to estimate productivity and susceptibility attributes for main primary species.~~ | Some quantitative information is available and is **adequate to assess** the impact of the UoA on the main primary species with respect to status.<br>~~OR~~<br>~~If RBF is used to score PI 2.1.1 for the UoA:~~<br>~~Some quantitative information is adequate to assess productivity and susceptibility attributes for main primary species.~~ | Quantitative information is available and is **adequate to assess with a high degree of certainty** the impact of the UoA on main primary species with respect to status. |
| | Met? | Yes | Yes | No |

Rationale

While there are no main primary species in the UoA under assessment here, in accordance with §SA3.3.1, if a team determines that the UoA has no impact on a particular component, the Information PI shall still be scored.

There are logbook recording requirements for all species. Regulation (EU) No 1967/2006 (Mediterranean Regulation)[37] and last updated in 2019 indicates that small pelagic species catches of any amount greater than 50 kg of live-weight equivalent must be recorded in logbooks.

Furthermore, in the Strait of Sicily, since 1998, the IAMC-CNR of Mazara del Vallo has been carrying out with regularity (at least once a year) acoustic surveys aimed at assessing the abundance and the spatial distribution of two fish species of small pelagics of particular interest economic: sardine, *Sardina pilchardus* and anchovy, *Engraulis encrasicolus*.

Survey and catch information is recorded and is available for stock assessment purposes (e.g. as used by the GFCM's WGSASP). Additional information is collected as part of the Italian DCF National programme[38].

Accordingly, in the likelihood of there being primary species in this UoA in the future, quantitative information would appear to be available and adequate to assess the impact of the UoA on the main primary species (likely sardine if reference points based management is adopted) with respect to status. **SG 60 and 80 would be met**. However, it is not clear if there is quantitative information available is adequate to assess with a high degree of certainty the impact of the UoA on main primary species with respect to status. SG 100 may not be met.

[37] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:02006R1967-20190814&from=EN

[38] https://datacollection.jrc.ec.europa.eu/np/2014/-/document_library_display/z9Yv/view/688307?_110_INSTANCE_z9Yv_topLink=home&_110_INSTANCE_z9Yv_delta2=20&_110_INSTANCE_z9Yv_keywords=&_110_INSTANCE_z9Yv_advancedSearch=false&_110_INSTANCE_z9Yv_andOperator=true&p_r_p_564233524_resetCur=false&_110_INSTANCE_z9Yv_cur2=2

| PI 2.1.3 | | | | |
|---|---|---|---|---|
| | **Information on the nature and extent of primary species is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage primary species** | | | |
| **b** | **Information adequacy for assessment of impact on minor primary species** | | | |
| | Guide post | | | Some quantitative information is adequate to estimate the impact of the UoA on minor primary species with respect to status. |
| | Met? | | | Yes |
| Rationale | | | | |
| There are no primary species in the UoA under assessment here. However, the information highlighted above would also apply to minor primary species in the eventuality these may arise in the future (e.g. sardine if reference points-based management is adopted). Some quantitative information is and would be available and adequate to estimate the impact of the UoA on minor primary species with respect to status. SG 100 would be met. | | | | |
| **c** | **Information adequacy for management strategy** | | | |
| | Guide post | Information is adequate to support **measures** to manage **main** primary species. | Information is adequate to support a **partial strategy** to manage **main** primary species. | Information is adequate to support a **strategy** to manage **all** primary species, and evaluate with a **high degree of certainty** whether the strategy is achieving its objective. |
| | Met? | Yes | Yes | No |
| Rationale | | | | |
| There are no main primary species such that **SG60 and SG80 would be met.** As outlined in PI 2.1.2 above, and due to general uncertainties, we cannot determine that there is a "strategy" in place to manage all potential primary species. In any case, it is not clear if current information is adequate to support a strategy to manage all primary species and evaluate with a high degree of certainty whether the strategy is achieving its objective. SG100 is not likely met. | | | | |
| References | | | | |
| Refer to P2 background information. | | | | |
| Overall Performance Indicator (PI) Rationale | | | | |
| Rationale is provided for each Scoring Issue. | | | | |
| Draft scoring range | | | ≥80 | |
| Information gap indicator | | | Information sufficient to score PI | |

## PI 2.2.1 – Secondary species outcome

| PI 2.2.1 | | The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | **Main secondary species stock status** | | | |
| | Guide post | Main secondary species are **likely** to be above biologically based limits.<br>OR<br>If below biologically based limits, there are **measures** in place expected to ensure that the UoA does not hinder recovery and rebuilding. | Main secondary species are **highly likely** to be above biologically based limits.<br>OR<br>If below biologically based limits, there is either **evidence of recovery** or a **demonstrably effective partial strategy** in place such that the UoA does not hinder recovery and rebuilding.<br>AND<br>Where catches of a main secondary species outside of biological limits are considerable, there is either evidence of recovery or a, demonstrably effective strategy in place between those MSC UoAs that have considerable catches of the species, to ensure that they collectively do not hinder recovery and rebuilding. | There is a **high degree of certainty** that main secondary species are above biologically based limits. |
| | Met? | NA | NA | NA |
| Rationale | | | | |
| European pilchard (*Sardina pilchardus*) is the only main secondary species identified in this UoA. The 2019 GFCM WGSASP[39] report considered this stock to be undergoing overexploitation. The advice was to reduce exploitation. The WG endorsed as validated assessment the a4a model and considered it as quantitative advice due to uncertainties in the terminal year estimates. Due to the short time series no biomass reference point was estimated. Due to the lack of reference points or an understanding of biological based limits, the species was assessed using the MSC RBF's PSA tool, as per MSC requirements. Sardine achieves an MSC PSA-derived score of 84. | | | | |
| b | **Minor secondary species stock status** | | | |
| | Guide post | | | Minor secondary species are highly likely to be above biologically based limits.<br>OR<br>If below biologically based limits', there is evidence that |

[39] http://www.fao.org/gfcm/technical-meetings/detail/en/c/1274635/

| PI 2.2.1 | | The UoA aims to maintain secondary species above a biologically based limit and does not hinder recovery of secondary species if they are below a biological based limit | | |
|---|---|---|---|---|
| | | | | the UoA does not hinder the recovery and rebuilding of secondary species |
| | Met? | | SG 80 (assumed to be) met by default | No |

Rationale

According to MSC FCP; G7.17.10.a (which is critical guidance and as such is normative), for 'minor' species, SGs only exist at the SG100 level such that, when scoring such minor species as scoring elements, the team should assume that **SG80 would be met by default**.

The minor secondary species identified for this UoA are: Salema (*Sarpa salpa*), Round sardinella (*Sardinella aurita*), and Atlantic mackerel (*Scomber scombrus*). None of the species here have a dedicated stock assessment for definition of status.

According to MSC interpretation on *Minor species and scoring element approach at SG100* (published 30th of August 2018)[40] assessment teams have the option of either scoring each secondary species as a distinct scoring element, or of grouping minor species and using an 'all or none' approach. In the case of the UoA under assessment here, the assessment team have determined that the 'all or none' approach is most appropriate. All minor species (as a group) automatically achieve at least SG80 (but not SG100).

Accordingly to available evidence, it cannot be said that minor secondary species are either highly likely to be above biologically based limits or, if below, there is evidence that the UoAs do not hinder the recovery and rebuilding of secondary species; **SG100 would not be met.**

References

See footnote links within text and refer to P2 background section.

Overall Performance Indicator (PI) Rationale

Rationale is provided for each Scoring Issue.

| | |
|---|---|
| Draft scoring range | ≥80 |
| Information gap indicator | Information sufficient to score PI |
| Data-deficient? (Risk-Based Framework needed) | Yes |

[40] https://mscportal.force.com/interpret/s/article/Minor-species-and-scoring-element-approach-at-SG100-7-10-7-1527586956233

## PI 2.2.2 – Secondary species management strategy

| PI 2.2.2 | | There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | **Management strategy in place** | | | |
| | Guide post | There are **measures** in place, if necessary, which are expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery. | There is a **partial strategy** in place, if necessary, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery. | There is a **strategy** in place for the UoA for managing main and minor secondary species. |
| | Met? | Yes | **No** | Not scored |

Rationale

In the context of this PI (MSC FCP v2.1; Table SA8: Principle 2 Phrases):
*A **"strategy"** represents a cohesive and strategic arrangement which may comprise one or more measures, an understanding of how it/they work to achieve an outcome and which should be designed to manage impact on that component specifically. A strategy needs to be appropriate to the scale, intensity and cultural context of the fishery and should contain mechanisms for the modification fishing practices in the light of the identification of unacceptable impacts.*

Sardine is the only main secondary species in this UoA.

**Technical measures**
The Italian fisheries management system is largely based on fishing effort control through input measures.
The fishing effort is managed through:

a) fishing licenses: fish resources can be exploited only by subjects holding a regular license (law no. 41/1982);
b) control of fishing capacity: capacity cannot exceed at any time the limits set by Regulation (EU) No 1380/2013 (Annex II: for Italy, 173,506 GT and 1,070,028 kW).

The management system also includes a number of important technical measures, which were introduced by Regulation (EU) No 1967/2006 (Mediterranean Regulation)[41] and last updated in 2019. These measures came into force only in 2010. The most important with relevance to sardine involve:

1) For surrounding nets the minimum mesh size shall be 14 mm.
2) *Sardina pilchardus* has a minimum landing size (MLS) of 11 cm (Member States may convert the minimum size into 55 specimens per kg).
3) For highly migratory species and small pelagic species any amount greater than 50 kg of live-weight equivalent must be recorded in the logbook
4) The length of netting shall be restricted to 800 m and the drop to 120 m, except in the case of tuna seines.

**Management Plans**

[41] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:02006R1967-20190814&from=EN

| PI 2.2.2 | There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch |
|---|---|

A Fishery Management Plan for small pelagics such as anchovies, sardine and mackerel caught with purse seines in Sicily (including GSA 16) has been published in 2011[42]. The objective of the management plan is the recovery of stocks within safe biological limits. The management plan called for:

1) 3% reduction in effort,
2) Fishing season from 15th of March to 15th of November,
3) Fishing permits,
4) Data collection (fleet capacity, effort, CPUE, biological data such as length, age and discards).

Considering the fishing measures mentioned above and the low vulnerability findings from the PSA, we can determine that here are **measures** in place expected to maintain or not hinder rebuilding of main secondary species at/to levels which are highly likely to be above biologically based limits or to ensure that the UoA does not hinder their recovery. **SG 60 would be met.**

However, when considering that the most recent stock assessment advised for a reduction in exploitation due to overexploitation, and due the lack of more direct measures to control exploitation (e.g. output controls), we cannot determine that there is a partial strategy in place, for the UoA that is expected to maintain or not hinder rebuilding of main secondary species to ensure that the UoA does not hinder their recovery. **SG 80 may not be met.**

| | | | | |
|---|---|---|---|---|
| **b** | **Management strategy evaluation** | | | |
| | Guide post | The measures are considered **likely** to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/species). | There is **some objective basis for confidence** that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved. | **Testing** supports **high confidence** that the partial strategy/strategy will work, based on information directly about the UoA and/or species involved. |
| | Met? | Yes | **No** | Not scored |

Rationale

In addition to the partial strategy presented above, under scoring issue "a", we note that based on the PSA performed on sardine, the vulnerability of the species is considered to be low. Accordingly, the measures are considered likely to work, based on plausible argument that some measures exist and PSA results indicating low risk. **SG 60 would be met.**

However, we also note that the 2019 GFCM WGSASP report[43] considered this stock to be undergoing overexploitation. Specifically, recruitment and SSB indices in both the XSA and a4a models appear to be at their lowest in their past 18 years. The observed decline in catches in the past 6-7 years is likely linked to the depressed SSB index. Fishing mortality on the stock is uncertain but appear to be either high and slightly decreasing or increasing over the past 4 years. Accordingly, we cannot determine that there is some objective basis for confidence that the measures/partial strategy will work, based on some information directly about the UoA and/or species involved. **SG 80 may not be met.**

| | |
|---|---|
| **c** | **Management strategy implementation** |

[42] Piano di Gestione per la pesca ai piccoli pelagici con le reti a circuizione della flottiglia siciliana (106.34 KB)
[43] http://www.fao.org/gfcm/technical-meetings/detail/en/c/1274635/

| PI 2.2.2 | | There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch | | |
|---|---|---|---|---|
| | Guide post | | There is **some evidence** that the measures/partial strategy is being **implemented successfully**. | There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a). |
| | Met? | | **No** | Not scored |
| Rationale | | | | |
| The 2019 GFCM WGSASP report[44] considered this stock to be undergoing overexploitation. Specifically, recruitment and SSB indices in both the XSA and a4a models appear to be at their lowest in their past 18 years. The observed decline in catches in the past 6-7 years is likely linked to the depressed SSB index. Fishing mortality on the stock is uncertain but appear to be either high and slightly decreasing or increasing over the past 4 years. Accordingly, we cannot determine that there is some evidence that the measures/partial strategy is being implemented successfully. **SG 80 may not be met.** | | | | |
| **d** | **Shark finning** | | | |
| | Guide post | It is **likely** that shark finning is not taking place. | It is **highly likely** that shark finning is not taking place. | There is a **high degree of certainty** that shark finning is not taking place. |
| | Met? | NA | NA | NA |
| Rationale | | | | |
| According to MSC, this scoring issue need not be scored if no secondary species are sharks. Since none of the secondary species are species of shark, **this scoring issue is not applicable.** | | | | |
| **e** | **Review of alternative measures to minimise mortality of unwanted catch** | | | |
| | Guide post | There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of main secondary species. | There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of main secondary species and they are implemented as appropriate. | There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of **unwanted** catch of all secondary species, and they are implemented, as appropriate. |
| | Met? | NA | NA | NA |
| Rationale | | | | |
| Although specific information on sardine discards in GSA 16 does not appear to be readily available, we note that overall, the discard of anchovy is a phenomenon of minor relevance, both as total amount and percentage on total catches. In particular, the discard of specimens below the minimum size is negligible, with no substantial differences between mid-water trawlers and lampara net (Sartor, 2014). | | | | |

[44] http://www.fao.org/gfcm/technical-meetings/detail/en/c/1274635/

| PI 2.2.2 | There is a strategy in place for managing secondary species that is designed to maintain or to not hinder rebuilding of secondary species and the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of unwanted catch |
|---|---|
| Furthermore, in the 2019 GFCM WGSASP report[45] we note that another purse seine sardine fishery in the Mediterranean, in GSA 22 (Aegean Sea), also has recorded negligible discards.<br><br>Taking into account similar fisheries examples mentioned above, we assume that discards of sardine in GSA 16 is also negligible. This scoring issue is therefore deemed not applicable. This assumption was confirmed verbally by interviews with a fishery representative and a researcher from the CNR. | |
| References | |
| Please refer to the footnotes references in the text. | |
| Overall Performance Indicator (PI) Rationale | |
| Rationale is provided for each Scoring Issue. | |
| Draft scoring range | 60-79 |
| Information gap indicator | More information sought:<br>• Management measures for sardine<br>• Sardine discards<br>• Discard review mechanisms, if relevant |

[45] http://www.fao.org/gfcm/technical-meetings/detail/en/c/1274635/

## PI 2.2.3 – Secondary species information

| PI 2.2.3 | | Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | **Information adequacy for assessment of impacts on main secondary species** | | | |
| | Guide post | Qualitative information is **adequate to estimate** the impact of the UoA on the main secondary species with respect to status.<br>OR<br>If RBF is used to score PI 2.2.1 for the UoA:<br>Qualitative information is adequate to estimate productivity and susceptibility attributes for main secondary species. | Some quantitative information is available and **adequate to assess** the impact of the UoA on main secondary species with respect to status.<br>OR<br>If RBF is used to score PI 2.2.1 for the UoA:<br>Some quantitative information is adequate to assess productivity and susceptibility attributes for main secondary species. | Quantitative information is available and **adequate to assess with a high degree of certainty** the impact of the UoA on main secondary species with respect to status. |
| | Met? | Yes | Yes | No |
| Rationale | | | | |
| There are logbook recording requirements for all species. Regulation (EU) No 1967/2006 (Mediterranean Regulation)[46] and last updated in 2019 indicates that small pelagic species catches of any amount greater than 50 kg of live-weight equivalent must be recorded in logbooks.<br><br>Furthermore, in the Strait of Sicily, since 1998, the IAMC-CNR of Mazara del Vallo has been carrying out with regularity (at least once a year) acoustic surveys aimed at assessing the abundance and the spatial distribution of two fish species of small pelagics of particular interest economic: sardine, *Sardina pilchardus* and anchovy, *Engraulis encrasicolus*.<br><br>Survey and catch information is recorded and is available for stock assessment purposes (e.g. as used by the GFCM's WGSASP[47]). Additional information is collected as part of the Italian DCF National programme[48]. Some quantitative information is available and adequate to assess the impact of the UoA on main secondary species with respect to status. **SG 60 and 80 may be met.**<br><br>However, we cannot determine that quantitative information is available and adequate to assess with a high degree of certainty the impact of the UoA on main secondary species with respect to status (i.e. the fishery is not actively managed using biomass or fishing mortality based reference points). SG 100 is not met. | | | | |
| b | **Information adequacy for assessment of impacts on minor secondary species** | | | |

[46] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:02006R1967-20190814&from=EN

[47] http://www.fao.org/gfcm/technical-meetings/detail/en/c/1274635/

[48] https://datacollection.jrc.ec.europa.eu/np/2014/-/document_library_display/z9Yv/view/688307?_110_INSTANCE_z9Yv_topLink=home&_110_INSTANCE_z9Yv_delta2=20&_110_INSTANCE_z9Yv_keywords=&_110_INSTANCE_z9Yv_advancedSearch=false&_110_INSTANCE_z9Yv_andOperator=true&p_r_p_564233524_resetCur=false&_110_INSTANCE_z9Yv_cur2=2

| PI 2.2.3 | | Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species | | |
|---|---|---|---|---|
| | Guide post | | | Some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status. |
| | Met? | | | No |
| Rationale | | | | |
| The minor secondary species identified for this UoA are: Salema (*Sarpa salpa*), Round sardinella (*Sardinella aurita*), and Atlantic mackerel (*Scomber scombrus*). None of the species here have a dedicated stock assessment for definition of status. We cannot determine that some quantitative information is adequate to estimate the impact of the UoA on minor secondary species with respect to status. **SG 100 would not be met.** | | | | |
| **c** | **Information adequacy for management strategy** | | | |
| | Guide post | Information is adequate to support **measures** to manage **main** secondary species. | Information is adequate to support a **partial strategy** to manage **main** secondary species. | Information is adequate to support a **strategy** to manage **all** secondary species, and **evaluate** with a **high degree of certainty** whether the strategy is **achieving its objective**. |
| | Met? | Yes | Yes | No |
| Rationale | | | | |
| Survey and catch information is recorded and is available for stock assessment purposes (e.g. as used by the GFCM's WGSASP). The 2019 GFCM WGSASP report[49] considered this stock to be undergoing overexploitation. Specifically, recruitment and SSB indices in both the XSA and a4a models appear to be at their lowest in their past 18 years. The observed decline in catches in the past 6-7 years is likely linked to the depressed SSB index. Fishing mortality on the stock is uncertain but appear to be either high and slightly decreasing or increasing over the past 4 years. Additional information is collected as part of the Italian DCF National programme.<br><br>All in all, catch and survey information is adequate to support a partial strategy to manage sardine. **SG 60 and 80 may be met.**<br><br>However, due to uncertainties, we cannot determine that information is adequate to support a strategy to manage main and minor secondary species, and evaluate with a *high degree of certainty* whether the strategy is achieving its objective. SG 100 is likely not met. | | | | |
| References | | | | |
| Please refer to the footnotes within the evidence text. | | | | |
| Overall Performance Indicator (PI) Rationale | | | | |
| Rationale is provided for each Scoring Issue. | | | | |
| Draft scoring range | | ≥80 | | |

[49] http://www.fao.org/gfcm/technical-meetings/detail/en/c/1274635/

| PI 2.2.3 | Information on the nature and amount of secondary species taken is adequate to determine the risk posed by the UoA and the effectiveness of the strategy to manage secondary species |
|---|---|
| Information gap indicator | Information sufficient to score PI |

## PI 2.3.1 – ETP species outcome

| PI 2.3.1 | | The UoA meets national and international requirements for the protection of ETP species<br>The UoA does not hinder recovery of ETP species | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | **Effects of the UoA on population/stock within national or international limits, where applicable** | | | |
| | Guide post | Where national and/or international requirements set limits for ETP species, the **effects of the UoA** on the population/ stock are known and **likely** to be within these limits. | Where national and/or international requirements set limits for ETP species, the **combined effects of the MSC UoAs** on the population /stock are known and **highly likely** to be within these limits. | Where national and/or international requirements set limits for ETP species, there is a **high degree of certainty** that the **combined effects of the MSC UoAs** are within these limits. |
| | Met? | NA | NA | NA |
| Rationale | | | | |
| No significant effects of the anchovy purse seine fishery on ETP species have been identified. However, we consider that some interactions may occur with short-beaked common dolphin *Delphinus delphis*. There are no known limit based national/international requirements for this species. This Scoring Issue is not applicable. | | | | |
| **b** | **Direct effects** | | | |
| | Guide post | Known direct effects of the UoA are likely to not **hinder recovery** of ETP species. | Direct effects of the UoA are **highly likely** to not **hinder recovery** of ETP species. | There is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species. |
| | Met? | Yes | Yes | No |
| Rationale | | | | |
| The fishery may have some minor interactions with short-beaked common dolphin *Delphinus delphis*.<br><br>The short-beaked common dolphin (or common dolphin) was once abundant and widely distributed in the Mediterranean Sea. Mussi et al., 2019[50] highlights that in the 1960s, the species declined everywhere in the region. The exact causes for the decline are still unknown. Nonetheless, there is indication that interacting factors, such as prey depletion caused by overfishing and habitat degradation, contaminants, climate change and incidental bycatch in fishing gears, are affecting the species' survival in the area. The study continues to say that today, the only known areas where the Mediterranean common dolphin is relatively abundant are the Alboran Sea and the waters off Malta. Records of the species are also documented in the Pelagos Sanctuary area, in the Sicily Channel/Strait of Sicily near Lampedusa island and in Messina Strait, off western Sardinia, Israel, eastern Ionian Sea, Aegean Sea, and Cap Bon area (northern Tunisia). However, there are few data on its occurrence and distribution, and limited information on population size and trends[51].<br><br>In terms of risk from this fishery, a fishermen representative reported that fishermen are very careful about releasing the net or backing away from any dolphin that may get close to the nets during fishing operations to avoid issues. Dolphins are known to damage gear and scare off and scatter anchovies and as such may ruin a fishing trip. The risk to these animals is considered low and even if they were to get caught in the net, they would reportedly be let go | | | | |

[50] https://onlinelibrary.wiley.com/doi/full/10.1002/aqc.3061
[51] https://www.iucnredlist.org/species/6336/16236707#population

| PI 2.3.1 | The UoA meets national and international requirements for the protection of ETP species<br>The UoA does not hinder recovery of ETP species | | | |
|---|---|---|---|---|
| by lowering and raising the net, or released alive in the case of capture. The very low risk of bycatch and mortality to dolphins was confirmed uniformly by interview with GFCM staff, a fishermen representative and a researcher from the CNR. Direct effects of the UoA are highly likely to not hinder recovery of ETP species. **SG 60 and 80 would be met.**<br><br>However, due the lack of more specific evidence from the UoA we cannot determine that there is a high degree of confidence that there are no significant detrimental direct effects of the UoA on ETP species. **SG 100 is not met.** | | | | |
| **c** | **Indirect effects** | | | |
| | Guide post | | Indirect effects have been considered for the UoA and are thought to be **highly likely** to not create unacceptable impacts. | There is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species. |
| | Met? | | Yes | Yes |
| Rationale | | | | |
| Indirect effects of the fishery on common dolphin could relate to prey removal for the species. However, the diet of the common dolphin appears to be quite varied. For example, and consulting fishbase information[52] on the species a Portuguese study on the feeding habits of common dolphin[53] details the following diet for adults as such: 0.9% sand smelt, 3.3% european hake, 3.6% blue whiting, 8.2% snipefish, 8.9% Trachurus spp.., 11% *Scomber spp*.., 45.7% sardine, 0.2% Loliginidae, 1% Sepiolinae. Another study from France[54] detailed the common dolphin diet as being composed of 1% *Clupea harengus*, 32% *Merlangius merlangus*, 30% *Scomber scombrus*, 7% Unspecified *Trisopterus spp*., 29% *Trachurus trachurus*, 1% Unspecified Gobiidae. According to the above and due to the varied diet of the common dolphin there is a high degree of confidence that there are no significant detrimental indirect effects of the UoA on ETP species. **SG 80 and 100 may be met.** | | | | |
| References | | | | |
| Please refer to the references and footnotes provided here and throughout the P2 background section. | | | | |
| Overall Performance Indicator (PI) Rationale | | | | |
| Rationale is provided for each Scoring Issue. | | | | |
| Draft scoring range | | | ≥80 | |
| Information gap indicator | | | Information sufficient to score PI | |
| Data-deficient? (Risk-Based Framework needed) | | | No | |

[52] https://www.sealifebase.ca/summary/Delphinus-delphis.html
[53] https://www.sealifebase.ca/trophiceco/DietCompoSummary.php?dietcode=207&genusname=Delphinus&speciesname=delphis
[54] https://www.sealifebase.ca/trophiceco/DietCompoSummary.php?dietcode=636&genusname=Delphinus&speciesname=delphis

## PI 2.3.2 – ETP species management strategy

| PI 2.3.2 | | The UoA has in place precautionary management strategies designed to:<br>- meet national and international requirements;<br>- ensure the UoA does not hinder recovery of ETP species.<br><br>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | **Management strategy in place (national and international requirements)** | | | |
| | Guide post | There are **measures** in place that minimise the UoA-related mortality of ETP species, and are expected to be **highly likely to achieve** national and international requirements for the protection of ETP species. | There is a **strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to be **highly likely to achieve** national and international requirements for the protection of ETP species. | There is a **comprehensive strategy** in place for managing the UoA's impact on ETP species, including measures to minimise mortality, which is designed to **achieve above** national and international requirements for the protection of ETP species. |
| | Met? | NA | NA | NA |
| Rationale | | | | |
| There are no known limit based national/international requirements for this species. This Scoring Issue is not applicable. | | | | |
| **b** | **Management strategy in place (alternative)** | | | |
| | Guide post | There are **measures** in place that are expected to ensure the UoA does not hinder the recovery of ETP species. | There is a **strategy** in place that is expected to ensure the UoA does not hinder the recovery of ETP species. | There is a **comprehensive strategy** in place for managing ETP species, to ensure the UoA does not hinder the recovery of ETP species. |
| | Met? | Yes | Yes | No |
| Rationale | | | | |
| The short-beaked common dolphin is managed in the Mediterranean Sea through the 2004 ACCOBAMS Conservation Plan[55]. The main objectives of the plan are 1) attempts to define the conservation needs of common dolphins in the Mediterranean, 2) calls for enforcement of existing obligations of Mediterranean States with regard to the protection of the marine environment, 3) delineates other reasonable actions which are viewed as particularly promising to protect the endangered common dolphin population, 4) identifies an initial set of Mediterranean areas of conservation importance for common dolphins, 5) indicates specific management and research actions that should be taken in these areas in collaboration with the local stakeholders, and 6) defines research methods to shed light on the threats affecting common dolphins and identify areas of conservation importance in the region in addition to those indicated in the Plan. Furthermore, the actions proposed in the plan have been divided into five broad categories: 1) Management (including objectives relating to bycatch reduction in drifnet fisheries and management of epipelagic fisheries), 2) Legislation, 3) Research, 4) Capacity building, and 5) Awareness & Education.<br><br>Considering the low apparent risk to this species from the UoA (and consequent limited need for management), and the strategy highlighted in the Conservation Plan we can determine that there is a strategy in place that is expected | | | | |

[55] https://www.accobams.org/wp-content/uploads/2016/07/Conservation-Plan-for-Delphinus-delphis.pdf

| PI 2.3.2 | | The UoA has in place precautionary management strategies designed to:<br>- meet national and international requirements;<br>- ensure the UoA does not hinder recovery of ETP species.<br><br>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species | | |
|---|---|---|---|---|
| to ensure the UoA does not hinder the recovery of ETP species. **SG 60 and 80 may be met.** However, due to a lack of more specific fishery specific information we cannot determine that a "comprehensive strategy" (a complete and tested strategy made up of linked monitoring, analyses, and management measures and responses) is in place for managing this species. SG 100 may not be met. | | | | |
| **c** | **Management strategy evaluation** | | | |
| | Guide post | The measures are **considered likely** to work, based on **plausible argument** (e.g., general experience, theory or comparison with similar fisheries/species). | There is an **objective basis for confidence** that the measures/strategy will work, based on **information** directly about the fishery and/or the species involved. | The strategy/comprehensive strategy is mainly based on information directly about the fishery and/or species involved, and a **quantitative analysis** supports **high confidence** that the strategy will work. |
| | Met? | Yes | Yes | No |
| Rationale | | | | |
| Considering the low apparent risk to this species from the UoA (and consequent limited need for management), and the strategy highlighted in the Conservation Plan we can determine that there is an objective basis for confidence that the measures/strategy will work, based on information directly about the fishery and/or the species involved. **SG 60 and 80 may be met.** However, there is no apparent quantitative analysis supporting with high confidence that the strategy will work. SG 100 may not be met. | | | | |
| **d** | **Management strategy implementation** | | | |
| | Guide post | | There is some **evidence** that the measures/strategy is being implemented successfully. | There is **clear evidence** that the strategy/comprehensive strategy is being implemented successfully and **is achieving its objective as set out in scoring issue (a) or (b).** |
| | Met? | | Yes | No |
| Rationale | | | | |
| Considering the low apparent risk to this species from the UoA (and consequent limited need for management), and the strategy highlighted in the Conservation Plan we can determine that there is some evidence that the measures/strategy is being implemented successfully. **SG 80 would be met.** However, since clear evidence on the risk of bycatch is lacking, we cannot say that there is clear evidence that the strategy/comprehensive strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a) or (b). SG 100 may not be met. | | | | |
| **e** | **Review of alternative measures to minimize mortality of ETP species** | | | |
| | Guide post | There is a review of the potential effectiveness and practicality of alternative measures to minimise UoA- | There is a **regular** review of the potential effectiveness and practicality of alternative measures to minimise UoA- | There is a **biennial** review of the potential effectiveness and practicality of alternative measures to minimise UoA- |

| PI 2.3.2 | | The UoA has in place precautionary management strategies designed to:<br>- meet national and international requirements;<br>- ensure the UoA does not hinder recovery of ETP species.<br><br>Also, the UoA regularly reviews and implements measures, as appropriate, to minimise the mortality of ETP species | | |
|---|---|---|---|---|
| | | related mortality of ETP species. | related mortality of ETP species and they are implemented as appropriate. | related mortality ETP species, and they are implemented, as appropriate. |
| | Met? | Yes | Yes | No |

| Rationale |
|---|
| The ACCOBAMS parties meet every 3 years to review management measures and conservation needs of marine mammals in the Mediterranean[56]. The last meeting was held in Turkey in 2019. Conservation and management measures for common dolphin were discussed, including those for Italy (referring to the the OceanCare submission). Considering the low apparent risk to this species from the UoA (and consequent limited need for management/implementation), and the regular meetings of ACCOBAMS we can say that there is a regular review of the potential effectiveness and practicality of alternative measures to minimise UoA-related mortality of ETP species and they are implemented as appropriate. **SG 60 and 80 is met.** However, the review is not biennial. SG 100 is not met. |
| References |
| Please refer to the references and footnotes provided here and throughout the P2 background section. |
| Overall Performance Indicator (PI) Rationale |
| Rationale is provided for each Scoring Issue). |

| | |
|---|---|
| Draft scoring range | ≥80 |
| Information gap indicator | Information sufficient to score PI |

[56] https://accobams.org/category/meetings/meetings-of-the-parties/

## PI 2.3.3 – ETP species information

| PI 2.3.3 | | Relevant information is collected to support the management of UoA impacts on ETP species, including:<br>- Information for the development of the management strategy;<br>- Information to assess the effectiveness of the management strategy; and<br>- Information to determine the outcome status of ETP species | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | **Information adequacy for assessment of impacts** | | | |
| | Guide post | Qualitative information is **adequate to estimate** the UoA related mortality on ETP species.<br>OR<br>If RBF is used to score PI 2.3.1 for the UoA:<br>Qualitative information is **adequate to estimate productivity and susceptibility** attributes for ETP species. | Some quantitative information is **adequate to assess** the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species.<br>OR<br>If RBF is used to score PI 2.3.1 for the UoA:<br>Some quantitative information is adequate to assess productivity and susceptibility attributes for ETP species. | Quantitative information is available to assess with a high degree of certainty the **magnitude of UoA-related impacts, mortalities and injuries and the consequences for the status** of ETP species. |
| | Met? | Yes | Yes | No |
| Rationale | | | | |
| Although there is no apparent fishery specific information regarding the interaction of the UoA with dolphins, information gathered though stakeholder's interviews indicate that the risk of mortality to this species appears to be very limited. Hence SG 60 is met. The IUCN Red list page for the common dolphin[57] indicates that drift gillnets would be the gear that most affects this species. Drift nets are also mentioned in the ACCOBAMS conservation plan as the high-risk gear type responsible for bycatch mortality[58]. Purse seine gear is not mentioned in the plan. Hence, based on the apparent limited risk from purse seine gear, some quantitative information is adequate to assess the UoA related mortality and impact and to determine whether the UoA may be a threat to protection and recovery of the ETP species. **SG 80 is met**. However, the lack of quantitative data means SG 100 is not met. | | | | |
| **b** | **Information adequacy for management strategy** | | | |
| | Guide post | Information is adequate to support **measures** to manage the impacts on ETP species. | Information is adequate to measure trends and support a **strategy** to manage impacts on ETP species. | Information is adequate to support a **comprehensive strategy** to manage impacts, minimize mortality and injury of ETP species, and evaluate with a **high degree of certainty** whether a strategy is achieving its objectives. |
| | Met? | Yes | Yes | No |

[57] https://www.iucnredlist.org/species/6336/16236707#threats
[58] https://www.accobams.org/wp-content/uploads/2016/07/Conservation-Plan-for-Delphinus-delphis.pdf

| PI 2.3.3 | Relevant information is collected to support the management of UoA impacts on ETP species, including:<br>- Information for the development of the management strategy;<br>- Information to assess the effectiveness of the management strategy; and<br>- Information to determine the outcome status of ETP species |
|---|---|
| Rationale | |
| Considering the low apparent risk from this fishery and using the evidence provided in Scoring Issue a we can determine that information is adequate to measure trends and support a strategy to manage impacts on ETP species. **SG 60 and 80 is met**. However, more specific information would be required to evaluate with a high degree of certainty whether a strategy is achieving its objectives, and to confidently score SG100 (currently not met). | |
| References | |
| Please refer to the references and footnotes provided here and throughout the P2 background section. | |
| Overall Performance Indicator (PI) Rationale | |
| Rationale is provided for each Scoring Issue. | |
| Draft scoring range | ≥80 |
| Information gap indicator | Information sufficient to score PI |

## PI 2.4.1 – Habitats outcome

| PI 2.4.1 | | The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | **Commonly encountered habitat status** | | | |
| | Guide post | The UoA is **unlikely** to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. | The UoA is **highly unlikely** to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. | There is **evidence** that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. |
| | Met? | Water column - yes | Water column - yes | Water column - yes |
| Rationale | | | | |
| Commonly encountered habitats have been identified as the water column since this gear does not come into contact with the seabed and operates primarily within the water column and the surface.<br><br>The fishery uses purse seine gear. This gear operates with two boats per net. The main boat remains stationary while a much smaller boat encircles the fish with a long net that has floats on top. Once the net is in place, the purse line is pulled to close the bottom of the net and capture the fish, which are then hauled aboard the larger vessel. Purse seines are generally used to catch small or large pelagic species, and do not tend to have any contact with seafloor structures and benthic organisms. The overall risk to benthic habitat and species is deemed low[59] to negligible for this gear type. The very low risk of gear contact with the seabed or habitat types was also confirmed by interview with a fishermen representative and a researcher from the CNR. Furthermore, fishing with purse seines, boat seines, shore seines or similar nets above seagrass beds of, in particular, *Posidonia oceanica* or other marine phanerogams is prohibited, unless they do not physically touch the seabed[60].<br>There is evidence that the UoA is highly unlikely to reduce structure and function of the commonly encountered habitats to a point where there would be serious or irreversible harm. **SG 60, 80 and 100 are met.** | | | | |
| **b** | **VME habitat status** | | | |
| | Guide post | The UoA is **unlikely** to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm. | The UoA is **highly unlikely** to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm. | There is **evidence** that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm. |
| | Met? | Marine seagrasses and coralligenous communities - yes | Marine seagrasses and coralligenous communities - yes | Marine seagrasses and coralligenous communities - yes |
| Rationale | | | | |

[59] https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/1540-9295%282003%29001%5B0517%3ASGACIO%5D2.0.CO%3B2
[60] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006R1967&rid=1

| PI 2.4.1 | The UoA does not cause serious or irreversible harm to habitat structure and function, considered on the basis of the area covered by the governance body(s) responsible for fisheries management in the area(s) where the UoA operates |
|---|---|

**VMEs** were identified as marine seagrasses and coralligenous communities. However, the overall risk to benthic habitat and species is deemed low[61] to negligible for this gear type. The very low risk of gear contact with the seabed or habitat types was also confirmed by interview with a fishermen representative and a researcher from the CNR. Furthermore, fishing with purse seines, boat seines, shore seines or similar nets above seagrass beds of, in particular, *Posidonia oceanica* or other marine phanerogams is prohibited, unless they do not physically touch the seabed[62]. According to the above, we can deduce that there is evidence that the UoA is highly unlikely to reduce structure and function of the VME habitats to a point where there would be serious or irreversible harm. **SG 60, 80 and 100 are met.**

| | | | | |
|---|---|---|---|---|
| **c** | **Minor habitat status** | | | |
| | Guide post | | | There is **evidence** that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm. |
| | Met? | | | Yes |

Rationale

No **minor habitats** have been identified. For the same reasons mentioned in previous scoring issues we can deduce that there is evidence that the UoA is highly unlikely to reduce structure and function of the minor habitats to a point where there would be serious or irreversible harm. SG 100 is met.

References

Please refer to the references and footnotes provided here and throughout the P2 background section.

Overall Performance Indicator (PI) Rationale

Rationale is provided for each Scoring Issue.

| | |
|---|---|
| Draft scoring range | ≥80 |
| Information gap indicator | Information sufficient to score PI |
| Data-deficient? (Risk-Based Framework needed) | No |

[61] https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/1540-9295%282003%29001%5B0517%3ASGACIO%5D2.0.CO%3B2
[62] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006R1967&rid=1

## PI 2.4.2 – Habitats management strategy

| PI 2.4.2 | | There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | **Management strategy in place** | | | |
| | Guide post | There are **measures** in place, if necessary, that are expected to achieve the Habitat Outcome 80 level of performance. | There is a **partial strategy** in place, if necessary, that is expected to achieve the Habitat Outcome 80 level of performance or above. | There is a **strategy** in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats. |
| | Met? | Yes | Yes | Yes |
| Rationale | | | | |
| The overall risk to benthic habitat and species is deemed low[63] to negligible for this gear type. The very low risk of gear contact with the seabed or habitat types was also confirmed by interview with a fishermen representative and a researcher from the CNR. Furthermore, fishing with purse seines, boat seines, shore seines or similar nets above seagrass beds of, in particular, *Posidonia oceanica* or other marine phanerogams is prohibited, unless they do not physically touch the seabed[64]. Management measures or strategy to manage this gear type's effects on habitats is not strictly required. Hence, we can determine that *there is no need for an explicit strategy in place for managing the impact of all MSC UoAs/non-MSC fisheries on habitats*. **SG 60, 80 and 100 are met.** | | | | |
| **b** | **Management strategy evaluation** | | | |
| | Guide post | The measures are **considered likely** to work, based on plausible argument (e.g. general experience, theory or comparison with similar UoAs/habitats). | There is some **objective basis for confidence** that the measures/partial strategy will work, based on **information directly about the UoA and/or habitats** involved. | **Testing** supports **high confidence** that the partial strategy/strategy will work, based on **information directly about the UoA and/or habitats** involved. |
| | Met? | Yes | Yes | Yes |
| Rationale | | | | |
| Using the same evidence provided under scoring issue a management measures or strategies to manage this gear type's effects on habitats is not strictly required. **SG 60, 80 and 100 are met.** | | | | |
| **c** | **Management strategy implementation** | | | |
| | Guide post | | There is **some quantitative evidence** that the measures/partial strategy is being implemented successfully. | There is **clear quantitative evidence** that the partial strategy/strategy is being implemented successfully and is achieving its objective, as outlined in scoring issue (a). |
| | Met? | | Yes | Yes |
| Rationale | | | | |

[63] https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/1540-9295%282003%29001%5B0517%3ASGACIO%5D2.0.CO%3B2
[64] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006R1967&rid=1

| PI 2.4.2 | | There is a strategy in place that is designed to ensure the UoA does not pose a risk of serious or irreversible harm to the habitats | | |
|---|---|---|---|---|
| Management strategies nor their implementation are strictly required for this gear type's operations within the UoA. **SG 80 and 100 are met.** | | | | |
| **d** | **Compliance with management requirements and other MSC UoAs'/non-MSC fisheries' measures to protect VMEs** | | | |
| | Guide post | There is **qualitative evidence** that the UoA complies with its management requirements to protect VMEs. | There is **some quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant. | There is **clear quantitative evidence** that the UoA complies with both its management requirements and with protection measures afforded to VMEs by other MSC UoAs/non-MSC fisheries, where relevant. |
| | Met? | NA | NA | NA |
| Rationale | | | | |
| VMEs would not be affected by this fishery hence this Scoring Issue is deemed not applicable. | | | | |
| References | | | | |
| Please refer to the references and footnotes provided here and throughout the P2 background section. | | | | |
| Overall Performance Indicator (PI) Rationale | | | | |
| Rationale is provided for each Scoring Issue. | | | | |
| Draft scoring range | | ≥80 | | |
| Information gap indicator | | Information sufficient to score PI | | |

## PI 2.4.3 – Habitats information

| PI 2.4.3 | | Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | **Information quality** | | | |
| | Guide post | The types and distribution of the main habitats are **broadly understood**.<br>OR<br>If CSA is used to score PI 2.4.1 for the UoA:<br>Qualitative information is adequate to estimate the types and distribution of the main habitats. | The nature, distribution and **vulnerability** of the main habitats in the UoA area are known at a level of detail relevant to the scale and intensity of the UoA.<br>OR<br>If CSA is used to score PI 2.4.1 for the UoA:<br>Some quantitative information is available and is adequate to estimate the types and distribution of the main habitats. | The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats. |
| | Met? | Yes | Yes | Yes |
| Rationale | | | | |
| The overall risk to benthic habitat and species is deemed low[65] to negligible for this gear type. The very low risk of gear contact with the seabed or habitat types was also confirmed by interview with a fishermen representative and a researcher from the CNR. All in all, habitat distribution is not explicitly relevant to this type of gear as it operates in the water column. The distribution of all habitats is known over their range, with particular attention to the occurrence of vulnerable habitats. **SG 60, 80 and 100 would be met.** | | | | |
| b | **Information adequacy for assessment of impacts** | | | |
| | Guide post | Information is adequate to broadly understand the nature of the main impacts of gear use on the main habitats, including spatial overlap of habitat with fishing gear.<br>OR<br>If CSA is used to score PI 2.4.1 for the UoA:<br>Qualitative information is adequate to estimate the consequence and spatial attributes of the main habitats. | Information is adequate to allow for identification of the main impacts of the UoA on the main habitats, and there is reliable information on the spatial extent of interaction and on the timing and location of use of the fishing gear.<br>OR<br>If CSA is used to score PI 2.4.1 for the UoA:<br>Some quantitative information is available and is adequate to estimate the consequence and spatial | The physical impacts of the gear on all habitats have been quantified fully. |

[65] https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/1540-9295%282003%29001%5B0517%3ASGACIO%5D2.0.CO%3B2

| PI 2.4.3 | | Information is adequate to determine the risk posed to the habitat by the UoA and the effectiveness of the strategy to manage impacts on the habitat | | |
|---|---|---|---|---|
| | | | attributes of the main habitats. | |
| | Met? | Yes | Yes | Yes |
| Rationale | | | | |
| The overall risk to benthic habitat and species is deemed low[66] to negligible for this gear type. The very low risk of gear contact with the seabed or habitat types was also confirmed by interview with a fishermen representative and a researcher from the CNR. The physical impacts of the gear on all habitats have been quantified fully. These are considered to be negligible. **SG 60, 80 and 100 would be met.** | | | | |
| **c** | **Monitoring** | | | |
| | Guide post | | Adequate information continues to be collected to detect any increase in risk to the main habitats. | Changes in all habitat distributions over time are measured. |
| | Met? | | Yes | Yes |
| Rationale | | | | |
| The overall risk to benthic habitat and species is deemed low[67] to negligible for this gear type. The very low risk of gear contact with the seabed or habitat types was also confirmed by interview with a fishermen representative and a researcher from the CNR. Management is not strictly required. Changes in all habitat distributions over time are measured. **SG 80 and 100 would be met.** | | | | |
| References | | | | |
| Please refer to the references and footnotes provided here and throughout the P2 background section. | | | | |
| Overall Performance Indicator (PI) Rationale | | | | |
| Rationale is provided for each Scoring Issue. | | | | |
| Draft scoring range | | ≥80 | | |
| Information gap indicator | | Information sufficient to score PI | | |

[66] https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/1540-9295%282003%29001%5B0517%3ASGACIO%5D2.0.CO%3B2
[67] https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/1540-9295%282003%29001%5B0517%3ASGACIO%5D2.0.CO%3B2

## PI 2.5.1 – Ecosystem outcome

| PI 2.5.1 | | The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | **Ecosystem status** | | | |
| | Guide post | The UoA is **unlikely** to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. | The UoA is **highly unlikely** to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. | There is **evidence** that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. |
| | Met? | Yes | Yes | No |

Rationale

A holistic food web model (quantitative Ecopath with Ecosim model; Agnetta et al., 2019)[68] has been developed in the Strait of Sicily in order to understand the interplay between the benthic pelagic coupling and mixed fisheries in a Mediterranean system.

According to the model outputs, the bulk of consumption fluxes (~95%, 1500 t km-2 years-1) was exchanged by lower "taxonomic" groups (i.e. macro-benthos, zooplankton, euphausiids and bacteria) across the benthic and pelagic domains. The remaining consumption flux (~ 5%) was determined by all other functional groups, with epipelagic fish (EPI) and mesopelagic fish crustacean feeders (MSC) having the most relevant flows for benthic-pelagic coupling both as consumers and sources. Many other functional groups FGs (e.g., horse mackerel *Trachurus* spp., TRA and sardine, SAR), contributed to a less extent to the consumption fluxes linked to BPC although they had high biomass and were predators and preys across benthic and pelagic domains as well.

In the benthic domain, groups with high εi (overall cumulative impact produced by a component) were suprabenthos (SUP), macrobenthos carnivore (C), omnivore (O), scavenger (SCA) and detritus feeder (DF); in the demersal domain, high εi values were shown by demersal fish from slope (DFS), TRA, MSC, rays from shelf (RSH), sharks from slope (SSS) and decapods natant from the slope (DNS). Finally, in the pelagic domain, large pelagic fish (LPL), euphausiids (EUP), European anchovy (ENG), zooplankton medium (ZM) and small (ZS) were the groups with highest εi. These linkages are shown in Figure 17.

The Agnetta study also highlighted fisheries impacts on different ecosystem elements. Bottom trawlers of LOA class 2 and 3 had negative direct impact on main target demersal species such as large European hake (HAK3 and 4), red mullet (MUL3), rays and sharks (RSH and RSS), but had positive effects on hake and red mullet juvenile (HAK1 and 2; MUL0 and 1). Moreover, these fisheries had negative indirect impact on benthic organisms such as benthic decapods (mainly DNH, DRH) mediated by the depletion of their predators.

Similarly, longliners and purse-seiners had negative effects on their main pelagic targets, i.e., the large pelagic (swordfish (XIP), tuna (THU), large pelagics (LPL)) but also and indirect positive effect on several demersal species such as TRA, mesopelagic fish jellyfish feeders (MSG), mesopelagic piscivorous fish (MSP) and notably, HAK3 and HAK4. Interestingly purse-seiners have negative impact on jellyfish (ZG) which is not among their target species. HAK and TRA were bycatch species of pelagic pair trawlers (PTM) and midwater-mixed trawlers (OTM) and were indirectly favored by purse-seiners (LOA1 and 2) through the benthic—pelagic coupling (BPC). Due to the large amount of links in the Strait of Sicily foodweb, and considering the high productivity and relative low susceptibility

[68] https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0210659

| PI 2.5.1 | The UoA does not cause serious or irreversible harm to the key elements of ecosystem structure and function |
|---|---|
| of the species as derived by the RBF's CA and PSA analysis, there is evidence that the UoA is highly unlikely to disrupt the key elements underlying ecosystem structure and function to a point where there would be a serious or irreversible harm. **SG 60 and 80 are likely met.** However, more specific fishery information may be required to determine that there is **evidence** of such. SG 100 may not be met. | |
| References | |
| Please refer to the references and footnotes provided here and throughout the P2 background section. | |
| Overall Performance Indicator (PI) Rationale | |
| Rationale is provided for each Scoring Issue. | |
| Draft scoring range | ≥80 |
| Information gap indicator | Information sufficient to score PI |
| Data-deficient? (Risk-Based Framework needed) | No |

## PI 2.5.2 – Ecosystem management strategy

| PI 2.5.2 | | There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | **Management strategy in place** | | | |
| | Guide post | There are **measures** in place, if necessary which take into account the **potential impacts** of the UoA on key elements of the ecosystem. | There is a **partial strategy** in place, if necessary, which takes into account **available information and is expected to restrain impacts** of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance. | There is a **strategy** that consists of a **plan**, in place which contains measures to **address all main impacts of the UoA** on the ecosystem, and at least some of these measures are in place. |
| | Met? | Yes | Yes | No |

Rationale

Stock assessments are routinely carried out both in the framework of working group on stock assessment of small pelagic species in GFCM (e.g.: 2019 GFCM WGSASP report[69]) and in the framework of STECF (e.g.: STECF, 2013). The management plan (MIPAFF, 2011[70]) specific for fishing vessels registered in the Sicilian maritime compartments that practice purse seine and pelagic pair trawl fisheries, has as objective to recover the stocks within biological safety limits in agreement with CFP requirements. Such recovery has a bearing on the ecosystem structure and function. Management measures include minimum landing sizes, spatial and temporal limitations which restrict the areas where fishing is allowed and protect juveniles. The fishery is also subject to effort limitations imposed by authorities. There is also a decommissioning plan on the capacity. Given the fact that anchovy is a highly productive species the team concludes that removal from the fishery is maintained at levels below that which is likely to cause a risk to the target species. RBF scores confirm that the species is not at high risk from exploitation.

Coupling the available management measures to model outputs from Agnetta et al., 2019[71], we can also see that in the Strait of Sicily the bulk of ecosystem consumption fluxes (~95%, 1500 t km-2 years-1) was exchanged by lower "taxonomic" groups (i.e. macro-benthos, zooplankton, euphausiids and bacteria) across the benthic and pelagic domains. The remaining consumption flux (~ 5%) was determined by all other functional groups, with epipelagic fish (EPI) and mesopelagic fish crustacean feeders (MSC) having the most relevant flows for benthic-pelagic coupling both as consumers and sources. Many other functional groups FGs (e.g., horse mackerel Trachurus spp., TRA and sardine, SAR), contributed to a less extent to the consumption fluxes linked to BPC although they had high biomass and were predators and preys across benthic and pelagic domains as well.

Hence, there is a partial strategy in place, if necessary, which takes into account available information and is expected to restrain impacts of the UoA on the ecosystem so as to achieve the Ecosystem Outcome 80 level of performance. **SG 60 and 80 are met.**

However, we cannot determine that the strategy consists of a plan in place which contains measures to address all main impacts of the UoA on the ecosystem, and at least some of these measures are in place. This is because the

[69] http://www.fao.org/gfcm/technical-meetings/detail/en/c/1274635/

[70] https://webcache.googleusercontent.com/search?q=cache:OXOjZBB5z5wJ:https://www.politicheagricole.it/flex/cm/pages/ServeAttachment.php/L/IT/D/4%25252Fe%25252Fb%25252FD.cfa0001a323ee507c000/P/BLOB%253AID%253D6896/E/pdf+&cd=2&hl=en&ct=clnk&gl=ie

[71] https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0210659

| PI 2.5.2 | There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function | | | |
|---|---|---|---|---|
| rules for specifying the management measures are not responsive to the state of the stock and stock assessment or management plan do not appear to consider this small pelagic in light of its place within the Strait of Sicily ecosystem. SG 100 is not met. | | | | |
| **b** | **Management strategy evaluation** | | | |
| | Guide post | The **measures** are considered likely to work, based on plausible argument (e.g., general experience, theory or comparison with similar UoAs/ ecosystems). | There is **some objective basis for confidence** that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved. | **Testing** supports **high confidence** that the partial strategy/ strategy will work, based on information directly about the UoA and/or ecosystem involved. |
| | Met? | Yes | No | No |
| Rationale | | | | |
| Management measures for the UoA include minimum landing sizes, spatial and temporal limitations, which restrict the areas where fishing is allowed and protect juveniles. The fishery is also subject to effort limitations imposed by authorities. There is also a decommissioning plan on the capacity. Given the fact that anchovy is a highly productive species the team concludes that removal from the fishery is maintained at levels that is below that which is likely to cause a risk to the target species. RBF scores confirm that the species is not a high risk from exploitation. In addition, the foodweb dynamics of this ecosystem indicate that although anchovy is an important species, there are many other important species, links and pathways for maintaining stability and structure of the foodweb, as elucidated by Agnetta et al., 2019[72]. Hence, available measures (coupled to the relatively high productivity of this species) are considered likely to work, based on plausible argument (e.g., some measures are available and the role of anchovy in the ecosystem is not that of a formal Low Trophic Level species as per MSC definition). **SG 60 may be met.**<br><br>However, in Italy, the performance of the harvest strategy in place to manage small pelagics in the Strait of Sicily has not been fully evaluated. The Italian MP (MIPAAF, 2011)[73] does not clearly state what actions will be taken at what specific trigger reference point levels. Furthermore, the existing HCR is not well defined and has not been explicitly defined or agreed, for example, the reduction of fishing effort did not follow the simulation scenarios presented in the management plan. Hence, we cannot determine that there is some objective basis for confidence that the measures/ partial strategy will work, based on some information directly about the UoA and/or the ecosystem involved. SG 80 may not be met. | | | | |
| **c** | **Management strategy implementation** | | | |
| | Guide post | | There is **some evidence** that the measures/partial strategy is being **implemented successfully**. | There is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a). |
| | Met? | | Yes | No |

[72] https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0210659

[73] https://webcache.googleusercontent.com/search?q=cache:OXOjZBB5z5wJ:https://www.politicheagricole.it/flex/cm/pages/ServeAttachment.php/L/IT/D/4%25252Fe%25252Fb%25252FD.cfa0001a323ee507c000/P/BLOB%253AID%253D6896/E/pdf+&cd=2&hl=en&ct=clnk&gl=ie

| PI 2.5.2 | There are measures in place to ensure the UoA does not pose a risk of serious or irreversible harm to ecosystem structure and function |
|---|---|
| Rationale | |
| In terms of implementation of management measures there is some evidence that the measures in place for the fishery have been implemented successfully. For example, fishing effort data referring to the 2019 DCF Fisheries Dependent Information (FDI) data call for the period 2015-2018 and 2015 DCF Med and Black sea data call for the period 2005-2014 are expressed in nominal effort (kW x fishing days in **Error! Reference source not found.**). The fishing effort time series show a clear decrease for the purse seine fleet while the pelagic pair trawl fleet shows a rather stable trend. Since some measure of effort control will have positive effects for the wider ecosystem and its health, structure and function, there is some evidence that the measures/partial strategy is being implemented successfully. **SG 80 would be met.** However, due to lack of more evidence for a more effective harvest control rule or framework and specific consideration about ecosystem effects, we cannot determine that there is clear evidence that the partial strategy/strategy is being implemented successfully and is achieving its objective as set out in scoring issue (a). SG 100 would not be met. | |
| References | |
| Please refer to the references and footnotes provided here and throughout the P2 background section. | |
| Overall Performance Indicator (PI) Rationale | |
| Rationale is provided for each Scoring Issue. | |
| Draft scoring range | 60-79 |
| Information gap indicator | Information insufficient to score PI:<br>• Better information on the management measures in place for this fishery would need to be documented. |

## PI 2.5.3 – Ecosystem information

| PI 2.5.3 | | There is adequate knowledge of the impacts of the UoA on the ecosystem | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | **Information quality** | | | |
| | Guide post | Information is adequate to **identify** the key elements of the ecosystem. | Information is adequate to **broadly understand** the key elements of the ecosystem. | |
| | Met? | Yes | Yes | |
| Rationale | | | | |
| A holistic food web model (quantitative Ecopath with Ecosim model; Agnetta et al., 2019)[74] has been developed in the Strait of Sicily in order to understand the interplay between the benthic pelagic coupling and mixed fisheries in a Mediterranean system. The reconstruction of the food web required review and integration of a vast set of local and regional biological information from bacteria to large pelagic species that were aggregated into 72 functional groups. Fisheries in the region were described by 18 fleet segments resulting from combination of fishing gears and fishing vessel size. Input data included biological and diet data, as well as MEDITS survey relative abundance for most species, and acoustic survey information for anchovy and sardine. The role of the species and fishery under assessment here were broadly elucidated in the study. Information is adequate to broadly understand the key elements of the ecosystem. **SG 60 and 80 are met.** | | | | |
| **b** | **Investigation of UoA impacts** | | | |
| | Guide post | Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, but **have not been investigated** in detail. | Main impacts of the UoA on these key ecosystem elements can be inferred from existing information, and **some have been investigated in detail**. | Main interactions between the UoA and these ecosystem elements can be inferred from existing information, and **have been investigated in detail**. |
| | Met? | Yes | Yes | No |
| Rationale | | | | |
| The Agnetta et al., 2019[75] study has highlighted fisheries impacts on different ecosystem elements of the Strait of Sicily. Bottom trawlers of LOA class 2 and 3 had negative direct impact on main target demersal species such as large European hake (HAK3 and 4), red mullet (MUL3), rays and sharks (RSH and RSS), but had positive effects on hake and red mullet juvenile (HAK1 and 2; MUL0 and 1). Moreover, these fisheries had negative indirect impact on benthic organisms such as benthic decapods (mainly DNH, DRH) mediated by the depletion of their predators. Similarly, longliners and purse-seiners had negative effects on their main pelagic targets, i.e., the large pelagic (swordfish (XIP), tuna (THU), large pelagics (LPL)) but also and indirect positive effect on several demersal species such as TRA, mesopelagic fish jellyfish feeders (MSG), mesopelagic piscivorous fish (MSP) and notably, HAK3 and HAK4. Interestingly purse-seiners have negative impact on jellyfish (ZG) which is not among their target species. HAK and TRA were bycatch species of pelagic pair trawlers (PTM) and midwater-mixed trawlers (OTM) and were indirectly favored by purse-seiners (LOA1 and 2) through bentho-pelagic coupling. Main impacts of the UoA on these key ecosystem elements (i.e. removal of small pelagics) can be inferred from existing information, and some have been investigated in detail. **SG 60 and 80 would be met.** However, not all have been investigated in detail. SG 100 is not met. | | | | |

[74] https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0210659
[75] https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0210659

| PI 2.5.3 | | | There is adequate knowledge of the impacts of the UoA on the ecosystem | |
|---|---|---|---|---|
| | | | | |
| **c** | **Understanding of component functions** | | | |
| | Guide post | | The main functions of the components (i.e., P1 target species, primary, secondary and ETP species and Habitats) in the ecosystem are **known**. | The impacts of the UoA on P1 target species, primary, secondary and ETP species and Habitats are identified and the main functions of these components in the ecosystem are **understood**. |
| | Met? | | Yes | Yes |
| Rationale | | | | |
| The main function of P1 (anchovy) and P2 species (other small pelagic species), and marine mammals in the ecosystem are broadly known. The effects of the fishery on these elements have been identified and assessed in relation to the UoA in previous performance indicators. The Agnetta et al., 2019[76] foodweb model also showed that the bulk of consumption fluxes (~95%, 1500 t km-2 years-1) in the strait of Sicily was exchanged by lower "taxonomic" groups (i.e. macro-benthos, zooplankton, euphausiids and bacteria) across the benthic and pelagic domains. The remaining consumption flux (~ 5%) was determined by all other functional groups, with epipelagic fish (EPI) and mesopelagic fish crustacean feeders (MSC) having the most relevant flows for benthic-pelagic coupling both as consumers and sources. Many other functional groups FGs (e.g., horse mackerel Trachurus spp., TRA and sardine, SAR), contributed to a less extent to the consumption fluxes linked to BPC although they had high biomass and were predators and preys across benthic and pelagic domains as well. The impacts of the UoA on P1 target species, secondary and ETP species are identified and the main functions of these components in the ecosystem are understood. **SG 80 and 100 would be met.** | | | | |
| **d** | **Information relevance** | | | |
| | Guide post | | Adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred. | Adequate information is available on the impacts of the UoA on the components **and elements** to allow the main consequences for the ecosystem to be inferred. |
| | Met? | | Yes | No |
| Rationale | | | | |
| As highlighted in Scoring Issue a and c, and using the foodweb information from Agnetta et al. (2019) we can determine that adequate information is available on the impacts of the UoA on these components to allow some of the main consequences for the ecosystem to be inferred. **SG 80 is met.** However, more specific fishery information in relation to the ecosystem would be required to score and meet SG 100. | | | | |
| **e** | **Monitoring** | | | |

[76] https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0210659

| PI 2.5.3 | | There is adequate knowledge of the impacts of the UoA on the ecosystem | | |
|---|---|---|---|---|
| | Guide post | | Adequate data continue to be collected to detect any increase in risk level. | Information is adequate to support the development of strategies to manage ecosystem impacts. |
| | Met? | | Yes | No |
| Rationale | | | | |
| A sufficient range of information, including data on total catches, age and weight composition of the catches, abundance surveys together with age and weight composition of the survey catch to inform the current fishery's harvest strategy, is available (see Italian DCF National programme[77]). As well as data used directly in the stock assessment (catch-at-age, survey and LPUE data), the last one of which was carried out in 2019 by the GFCM, additional information includes changing patterns of growth, the relative spatial distribution of juvenile and adult and removals from other fleets. Adequate data continue to be collected to detect any increase in risk level of the fishery on the ecosystem. **SG 80 would be met.** However, additional information may be required to determine that information is adequate to support the development of strategies to manage ecosystem impacts. For example, if we consider the recommendation of the last GFCM-WG on small pelagics (2019 GFCM WGSASP report[78]): "For the future workplan it was suggested to re-evaluate the acoustic survey index to take into account possible population distribution/migration over the north part of Sicily, re-evaluate the time series of the catches regarding the possible inclusion of landings outside GSA16 in the current time-series", some information on the fishery may be lacking, which may itself have effects on the wider Strait of Sicily ecosystem. SG 100 may not be met. | | | | |
| References | | | | |
| Please refer to the references and footnotes provided here and throughout the P2 background section. | | | | |
| Overall Performance Indicator (PI) Rationale | | | | |
| Rationale is provided for each Scoring Issue. | | | | |
| Draft scoring range | | ≥80 | | |
| Information gap indicator | | Information sufficient to score PI | | |

[77] https://datacollection.jrc.ec.europa.eu/np/2014/-/document_library_display/z9Yv/view/688307?_110_INSTANCE_z9Yv_topLink=home&_110_INSTANCE_z9Yv_delta2=20&_110_INSTANCE_z9Yv_keywords=&_110_INSTANCE_z9Yv_advancedSearch=false&_110_INSTANCE_z9Yv_andOperator=true&p_r_p_564233524_resetCur=false&_110_INSTANCE_z9Yv_cur2=2

[78] http://www.fao.org/gfcm/technical-meetings/detail/en/c/1274635/

## 7.6 Principle 3

### 7.6.1 Principle 3 background

The UoA consist of the anchovy stock residing in and fished by vessels in GSA 16. The stock does not appear to be shared with any other EU countries. The UoA purse seine vessels are Italian-registered and fish under Italian licences, and report (via electronic logbooks) to the Italian management authorities.

The main management body for the UoA is therefore the Italian central government, which operates in accordance with its commitments as a Member State of the European Union and as a contracting party of the regional fishery management organisation, the UN FAO's General Fisheries Commission of the Mediterranean and Black Sea (GFCM). How each organisation works to manage the fishery is described in the sections below.

**EU Level Management**

As Italy is an EU Member State, the key legal framework for the management of the UoA is set out at the European level by the Common Fisheries Policy (CFP; European Regulation 1380/2013[79]). The CFP provides a framework under which shared stocks in European waters (stocks where the geographic distribution covers more than one European EEZ, or stocks fished outside 12 miles in a given EEZ) are managed on a common European basis.

EU vessels are all bound by the same rules and regulations as defined under the EU Common Fisheries Policy (CFP) (EC reg. 1380/2013). These rules continue to apply to vessels fishing outside EU waters, including outside the EEZs of the Member States.

The CFP also defines common objectives and requirements that the Italian operators in the fishery must adhere to. These are implemented in each Member State; in the case of Italy via presidential decrees.

The objective of the CFP is to ensure that fisheries and aquaculture are ecologically, economically and socially sustainable. It is also concerned with maintaining employment and the sector's economic viability.

Following the 2002 CFP reform, a new system for limiting the fishing capacity of the EU fleet entered into force on 1 January 2003. This system gave more responsibility to the Member States in achieving a better balance between the fishing capacity of their fleets and the available resources. An Italian Ministerial Circular of 07 October 2004 laid down a plan that aims at reducing fishing effort, particularly by encouraging a reduction in fishing vessels operating within 6 nautical miles of the baseline and using trawl nets.

The CFP is reviewed every 10 years and its most recent revision (EU Reg. 1308/2013) sought to make fisheries more sustainable. The new policy came into force in 2014[80], including commitments to:

- Fish stocks exploited at Maximum sustainable yield (MSY),
- Greater regionalization (through increased roles for Regional Advisory Councils, including the Mediterranean Sea Advisory Council (MEDAC[81]),
- An ecosystem approach to fisheries by ensuring fishing capacity is in line with fishing opportunities and moving more stocks under Long Term Management Plans,
- An obligation to land the fish that is caught (discard ban).

The EC's DG Maritime Affairs and Fisheries has recently published its strategic plan 2016-2020[82], which sets out fisheries management objectives and targets as well as those for marine environmental management.

For Monitoring, Control and Surveillance activities, the EU Member States are required to comply with the

[79] https://www.guardiacostiera.gov.it/en/Pages/common-fisheries-policy.aspx
[80] https://ec.europa.eu/fisheries/reform_en
[81] http://en.med-ac.eu/index.php
[82] https://ec.europa.eu/info/sites/info/files/strategic-plan-2016-2020-dg-mare_march2016_en.pdf

agreed control regulations within the CFP framework. Since 2007 these have been coordinated at an EU level by the European Fisheries Control Agency (EFCA)[83]. Its goal is to coordinate the fisheries inspection and control operational activities of Member States, and to provide assistance to the Member States in their application of the CFP.

The CFP includes requirements for fishing vessels longer than 12 meters to report their logbook data, including catch data, electronically and to have an approved satellite-based vessel monitoring system (VMS) on board[84]. Fishing vessels longer than 18 meters are also required to have an automatic identification system (AIS) on board. From May 2014, AIS must be on board all vessels over 15 meters in length.

As a European Union Member State, Italy has a responsibility to monitor fishing activities and catches, and to share such information via the Data Collection Framework (DCF), which is consistent with commitments under the GFCM.

The vessels are required to report the location and quantity of species retained on a daily basis via an electronic logbook that is transmitted to control authorities. Skippers must also notify authorities ahead of landing their fish and only into designated ports.

European fisheries management also involves taking decisions based on the best available scientific data. The European Commission receives advice from the Scientific, Technical and Economic Committee for Fisheries (STECF) and various other scientific organisations. In the event of data gaps, the EU has the means to fund studies and projects in the short, medium, and long term with the aim of rectifying the lack of data.

STECF can be consulted for the annual stock assessment results and STECF reports and recommendations are publicly available[85]. The outcomes of the deliberations of the EU Fisheries Commission are also publicly available via their communications and regulations.

**Management plan under the Mediterranean regulation 1967/2006**

The basic EC regulation for the fishing activity in the Mediterranean Sea is Council Regulation (EC) No 1967/2006 of 21 December 2006[86] concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea, amending Regulation (EEC) No 2847/93 and repealing Regulation (EC) No 1626/94.

The Regulation's aim is to establish an effective management framework, through an appropriate sharing of responsibilities between the Community and the Member States. It also extends to the Mediterranean High Sea the strict protection of certain marine species already afforded by Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, which was previously only applicable to marine waters under Member States' sovereignty.

This regulation introduces for the first time the concept of management plans for Mediterranean fisheries, which was present in the basic CFP regulation since 2002. A reference to those plans can be found in the preamble of the regulation, both at community level and national level:

> "*In view of the specific characteristics of many Mediterranean fisheries, which are restricted to certain geographical sub-zones, and taking into account the tradition of applying effort management system at sub-regional level, it is appropriate to provide for the establishment of Community and national management plans, combining in particular effort management with specific technical measures*."

It also introduces a procedure to deal with new fishing protected areas:

[83] https://www.efca.europa.eu/en
[84] https://ec.europa.eu/fisheries/cfp/control/technologies_en
[85] https://stecf.jrc.ec.europa.eu/reports/medbs
[86] https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32006R1967

"*By Decision 98/392/EC2 the Council has concluded the United Nations Convention on the Law of the Sea, which contains principles and rules relating to the conservation and management of the living resources of the high seas. In accordance with the rules of that Convention, the Community endeavours to coordinate the management and conservation of living aquatic resources with other coastal States.*"

Chapter VII of Regulation 1967/2006 includes provisions for Management Plans.

Article 18 refers to Community-level management plans that should be deployed to manage specific Mediterranean fisheries, in particular, in areas totally or partially beyond the territorial waters of Member States. Until now, there have not been any such plans at Community level.

Management plans may include measures which go beyond the provisions of this Regulation for the purpose of: increasing the selectivity of fishing gear; reducing discards and limiting the fishing effort. The measures to be included in the management plans had to be proportionate to the objectives, the targets and the expected time frame.

**Landing obligation**

The CFP regulation (EU) No 1380/2013[87] aims to progressively eliminate discards in all Union fisheries through the introduction of a landing obligation. Article 15(6) empowers the Commission to adopt discard plans by means of a delegated act for a period of no more than three years on the basis of joint recommendations developed by Member States in consultation with the relevant Advisory Councils. In accordance with the joint recommendation provided by the Mediterranean Advisory Council (MEDAC), the discard plan should cover all catches of species which are subject to minimum sizes as defined in Annex III to Regulation (EC) No 1967/2006.

This amount is above the average levels of discarding and with the de minimis derogation in place, there has been very limited impact from the landings obligation to date.

Since October 2014 the Commission has adopted several discard plans (through so-called delegated acts) in preparation of the implementation of the landing obligation. In the case of the discard plan for certain small pelagic fisheries in the Mediterranean Sea, which consider also the small pelagic fleets operating in GSA 16, the Commission Delegated Regulation (EU) No 1392/2014 of 20 October 2014[88] is longer in force since the end of 2017. Therefore, undersized catches must be landed and can be sold, but not for direct human consumption. Producer organisations have among their tasks the duty to help their members find adequate outlets for these catches, without promoting the creation of a market for undersized fish. On the other hand, Member States also have the obligation to assist fishermen by facilitating storage of undersize fish and finding possible outlets. Once landed, the undersized fish has to be handled in line with ABP (animal by-products) rules and processors must be able to distinguish these catches from fish destined for direct human consumption.

**GFCM**

The fishery advisory body in the Mediterranean is the General Fisheries Commission for the Mediterranean and Black Sea (hereafter GFCM). GFCM is a regional fisheries management organization (RFMO) established under the provisions of Article XIV of the FAO Constitution. The GFCM was established as a Council in 1952 and became a Commission with greater powers in 1997[89].

The main objective of the GFCM is to promote the development, conservation, rational management and best utilization of living marine resources as well as the sustainable development of aquaculture in the Mediterranean, the Black Sea and connecting waters (GFCM area of application).

[87] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02013R1380-20190814
[88] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32014R1392
[89] http://www.fao.org/gfcm/about/legal-framework/en/

The GFCM is currently composed of 23 member countries, including Italy, (22 member countries and the European Union) and 5 cooperating non contracting parties (Bosnia and Herzegovina · Georgia · Jordan · Republic of Moldova · Ukraine) who contribute to its autonomous budget to finance its functioning. Membership is open to Mediterranean coastal States and regional economic organizations as well as to United Nations member States whose vessels engage in fishing in its area of application.

The GFCM implements its policy and activities through its Secretariat, based at its headquarters in Rome, Italy. The Commission holds its regular sessions annually and operates during the intersession by means of its committees:

- Scientific Advisory Committee (SAC),
- Committee on Aquaculture (CAQ),
- Compliance Committee (CoC),
- Committee of Administration and Finance (CAF) and their subsidiary bodies, including the ad hoc Working Group for the Black Sea (WGBS),
- GFCM Bureau steers strategic orientations to the Commission and the Secretariat.

The Commission has the authority to adopt binding recommendations for fisheries conservation and management in its area of application and plays a critical role in fisheries governance in the region. In particular, its measures can relate to the regulation of fishing methods, fishing gear and minimum landing size, the establishment of open and closed fishing seasons and areas, and fishing effort control. GFCM Resolution GFCM/37/2013/2 established guidelines on the management of fishing capacity in the GFCM area to be followed by contracting parties. The GFCM is one of the few RFMOs worldwide entitled to adopt spatial management measures that regulate or restrict human activities in the high seas, e.g. by introducing closures or prohibiting the use of certain gears.

In cooperation with other RFMOs, the GFCM coordinates efforts by governments to effectively manage fisheries at the regional level following the 1995 FAO Code of Conduct for Responsible Fisheries (CCRF). Moreover, it closely cooperates with other international organizations in matters of mutual interest and it benefits from the support of cooperation projects and programmes at the regional and subregional level in order to enhance scientific cooperation and capacity-building among its members. The GFCM also manages a database of national fisheries legislation of member countries[90].

The GFCM has recently amended its legal framework and the Agreement for its establishment with a view to enhancing its efficiency and thus better responding to current and future challenges in the whole region[91].

The decision-making process can be considered to be well developed through the use of the GFCM – Scientific Advisory Committee (SAC) and its integrated advisory structure comprised of the STECF/MEDAC/European Commission, as well as the different interested parties having the option to participate in the decision-making. Advice to the GFCM can only be given by the SAC with other groups able to advise the SAC, but not the GFCM directly (GFCM Fishery Officer, pers comm.). The outcomes of the technical meetings and scientific councils are considered when taking decisions on fisheries management and made available on the GFCM website.

As with the CFP, National management plans must be consistent with GFCM plans, and can only be more restrictive, not less. The GFCM Compliance Committee meets years to assess how the contracting parties have enforced the agreed plans.

Proposed developments include an on-board observer programme (as set out in the GFCM mid-term strategy 2016-2020), which will be GFCM-wide complementing the EU's existing observer and reporting activities under the EU's Data Collection Framework.

[90] http://nationallegislation.gfcmsecretariat.org/index
[91] http://www.fao.org/gfcm/background/about/en/

**Italian Management**

The "*Ministero delle politiche agricole alimentari, forestali e del turismo*"( MIPAAFT) is the Central Government Ministry that is responsible for managing fishing activity in Italy. The "*Direzione generale della pesca marittima e dell'acquacoltura*" (hereater PEMAC) is part of this ministry and is responsible for carrying out this task. In 2019, the name "*Ministero delle politiche agricole alimentari e forestali*" has replaced that of: "*Ministero delle politiche agricole alimentari, forestali e del turismo*"[92] (hereafter MIPAAF or MIPAFFT in case of references to older documents and actions taken by such Ministry).

In Italy no legal or natural persons are allowed to engage in commercial fishing without the preliminary registration in the Fishing Company Register. Crew members are also registered in the Seamen Register and ships are recorded in apposite Vessels Register. This obligatory recording regime came from the Navigation Code, Presidential Decree No. 328/1952 of 1952, Law No. 963/1965 of 1965, and Presidential Decree No. 1639/1968 of 1968.

MIPAAF is the competent authority for Monitoring, Control and Surveillance (hereafter MCS).

In order to register, professional seamen must satisfy the following statutory requirements:

a) they must show that fishing is their sole or principal source of income; and

b) they must demonstrate that they have acquired adequate professional knowledge and skills to conduct commercial fishing operations (training course).

Currently this regime is confirmed by the context of the new Legislative Decree 153/2004[93]. The registers are kept by the local offices of the Ministry of Transport (Comando Generale delle Capitanerie di Porto or Coast Guard Authorities) located along the Italian coastline.

The Italian Coast Guard is delegated responsibility by MIPAAF for fisheries control at sea and on land. It works with the local and national agencies to apply these controls (e.g. with the financial ministry and police to progress prosecutions). On MCS, the Coastguard works with EFCA, and other control authorities to implement joint deployment plans such as those for specific fisheries (e.g. Bluefin tuna) or more generally (Mediterranean).

It operates the National Fishery Control Centre (Centro Controllo Nazionale Pesca - CCNP); in Rome and 15 regional offices, each with their own assets for aerial, sea and land-based inspections. For fisheries in GSA 16, the Italian Coastguard carries out aerial surveillance, sea-based inspections and port inspections with resources targeted using a risk analysis approach. Statistics on inspections and infringement are not available for the present UoA but only for the whole Italian fleet (see Ecomafie Report 2018 - https://www.legambiente.it/rapporto-ecomafia/). In the process of organizing interviews with stakeholders during the pre-assessment process, representatives of MIPAAF or the Coast Guard did not make themselves available for a meeting.

The Italian Government regularly convenes the sector to inform them of the resolutions and changes that affect or may affect the fishery, and they work hand in hand to find the best solution. This also means that the Government has first-hand knowledge of the sector's issues and concerns.

The fisheries sector participates in the Mediterranean Advisory Council (MEDAC[94]). The MEDAC is made up of European and national organizations representing the fisheries sector (including the industrial fleet, small-scale fisheries, the processing sector and trade unions) and other interest groups (such as environmental organizations, consumer groups and sports/recreational fishery associations) which operate in the Mediterranean area in the framework of the CFP. During the site visits, stakeholders of MEDAC confirmed that they had no formal MEDAC issued Opinions relating to this fishery or UoA.

[92] https://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/8
[93] http://extwprlegs1.fao.org/docs/pdf/ita44708.pdf
[94] http://en.med-ac.eu/index.php

The role of MEDAC includes the preparation of opinions on fisheries management and socio-economic aspects in support of the fisheries sector in the Mediterranean, to be submitted to the Member States and the European institutions in order to facilitate the achievement of the objectives of the CFP; MEDAC also proposes technical solutions and suggestions, such as joint recommendations (ex. Art. 18 Reg.1380 / 2013) at the request of the Member States. MEDAC consists of an executive committee and a number of thematic working groups (including Management Plans and GFCM issues) and regional focus groups[95], (including the Strait of Sicily Focus Group, GSA 16).

The Italian fishery sector itself is organized within co-operatives, many of which are also Producer Organisations or POs (an EU-recognized marketing body that often also acts as a representative of its members). Federpesca[96] and Federcoopesca[97] are umbrella bodies that represent these numerous sector organisations at a national level and are members of MEDAC.

**Fishery Specific Management**

For details of species-specific management in GSA 16 in relation to small pelagics please refer to *Section 7.4.1.4 Fishery and Management regulation in GSA 16*.

#### 7.6.1.1 P3 References


| | |
|---|---|
| Consolidated text: Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC | https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02013R1380-20190814 |
| Council Regulation (EC) No 1967/2006 of 21 December 2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea, amending Regulation (EEC) No 2847/93 and repealing Regulation (EC) No 1626/94 | https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32006R1967 |
| DLGS. 2004. Decreto Legislativo 26 maggio 2004, n. 153 "Attuazione della legge 7 marzo 2003, n. 38, in materia di pesca marittima" | http://extwprlegs1.fao.org/docs/pdf/ita44708.pdf |
| EC. 2014. Reform of the common fisheries policy. European Commission | https://ec.europa.eu/fisheries/reform_en |
| EC. 2016. Strategic Plan 2016-2020* DG Maritime Affairs and Fisheries. European Commission | https://ec.europa.eu/info/sites/info/files/strategic-plan-2016-2020-dg-mare_march2016_en.pdf |
| EC. 2018. Internal Audit Services Annual Activity Report. European Commission. | https://ec.europa.eu/info/sites/info/files/ias_aar_2018_final.pdf |
| EC. 2020. Better regulation: guidelines and toolbox. European Commission. | https://ec.europa.eu/info/law/law-making-process/planning-and-proposing-law/better-regulation-why-and-how/better-regulation-guidelines-and-toolbox_en |
| EC. 2020. Control Technologies. European Commission | https://ec.europa.eu/fisheries/cfp/control/technologies_en |


[95] http://en.med-ac.eu/gruppi.php
[96] http://www.federpesca.it
[97] http://www.federcoopesca.it

EC. 2020. FLAG Factsheet. European Commission. https://webgate.ec.europa.eu/fpfis/cms/farnet2/on-the-ground/flag-factsheets-list_en

EC. 2020. Mediterranean & Black Sea Stock Assessments Mediterranean & Black Sea Stock Assessments. European Commission https://stecf.jrc.ec.europa.eu/reports/medbs

EC. 2020. The EU's fisheries control system. European Commission https://ec.europa.eu/fisheries/cfp/control_en

EFCA. 2019 A Year in Review. European Fisheries Control Agency. https://www.efca.europa.eu/sites/default/files/EFCA%20AYIR_DEF_Digital.pdf

EFCA. 2020. European Fisheries Control Agency. European Commission https://www.efca.europa.eu/en

EP. 2020. Fisheries control and enforcement. European Parliament https://www.europarl.europa.eu/factsheets/en/sheet/116/fisheries-control-and-enforcement

EU. 2020. Court of Justice of the European Union (CJEU). https://europa.eu/european-union/about-eu/institutions-bodies/court-justice_en

Federcoopesca. 2020. Homepage. Federcoopesca. http://www.federcoopesca.it

Federpesca. 2020. Chi siamo. Federpesca http://www.federpesca.it/

GFCM. 2016. Basic texts of the General Fisheries Commission for the Mediterranean of the FAO. UN FAO, Rome, 2016. http://www.fao.org/3/a-i5450e.pdf

GFCM. 2018. SoMFi 2018. General Fisheries Commission for the Mediterranean - GFCM http://www.fao.org/gfcm/publications/somfi/2018/en/

GFCM. 2019. Compendium of GFCM decisions. General Fisheries Commission for the Mediterranean. https://gfcm.sharepoint.com/CoC/_layouts/15/guestaccess.aspx?docid=093ea3a39fe1645a5b5146124ca291a89&authkey=ASzLducZ3qcB9XhOZhcumvs

GFCM. 2020. Basic Text. General Fisheries Commission for the Mediterranean http://www.fao.org/gfcm/about/legal-framework/en/

GFCM. 2020. Decisions. General Fisheries Commission for the Mediterranean. http://www.fao.org/gfcm/decisions/ar/

GFCM. 2020. Scientific Advisory Committee on Fisheries. General Fisheries Commission for the Mediterranean http://www.fao.org/gfcm/about/structure/sac/en/

Guardia Costiera. 2020. Common Fisheries Policy. Capitanerie di Porto - Guardia Costiera https://www.guardiacostiera.gov.it/en/Pages/common-fisheries-policy.aspx

MEDAC. 2020. General Assembly. Mediterranean Advisory Council http://en.med-ac.eu/membri.php

MEDAC. 2020. Pareri e Lettere. Mediterranean Advisory Council http://en.med-ac.eu/pareri_lettere.php?page=2

MEDAC. 2020. Working Groups. Mediterranean Advisory Council http://en.med-ac.eu/gruppi.php

MIPAAF. 2011. Adozione dei piani nazionali di gestione della flotta. Ministero delle politiche agricole alimentari e forestali https://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/6896

MIPAAF. 2011. Piano di Gestione per la pesca ai piccoli pelagici con le reti a circuizione della flottiglia siciliana (ex art.24 del Reg. (CE) n.1198/2006 e art.19 del Reg. (CE) n.1967/2006). https://webcache.googleusercontent.com/search?q=cache:OXOjZBB5z5wJ:https://www.politicheagricole.it/flex/cm/pages/ServeAttachment.php/L/IT/D/4%25252Fe%25252Fb%25252FD.cfa0001a323ee507c000/P/BLOB%253AID%253D6896/E/pdf+&cd=2&hl=en&ct=clnk&gl=ie

MIPAAF. 2011. Piano di Gestione per la pesca ai piccoli pelagici con le reti a circuizione della flottiglia siciliana. Allegato 4 pelagici Sicilia. Ministero delle politiche agricole alimentari e forestali https://www.politicheagricole.it/flex/cm/pages/ServeAttachment.php/L/IT/D/9%252Fd%252Fe%252FD.321129f2739a3b7b8ff4/P/BLOB%3AID%3D6896/E/pdf

MIPAAF. 2011. Piano di Gestione per la pesca ai piccoli pelagici con le reti a circuizione della flottiglia siciliana. Ministero delle politiche agricole alimentari e forestali https://www.politicheagricole.it/flex/cm/pages/ServeAttachment.php/L/IT/D/4%252Fe%252

Fb%252FD.cfa0001a323ee507c000/P/BLOB%3AID%3D6896/E/pdf

MIPAAF. 2018. Decreto del Direttore Generale n. 26510 del 28 dicembre 2018. Modifica dei Piani di Gestione Nazionale relativi alle flotte di pesca per la cattura delle risorse demersali nell'ambito delle GSA 9, 10, 11, 16, 17, 18 e 19. Ministero delle politiche agricole alimentari e forestali — https://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/8

MIPAAF. 2020. Ministero istituzioni e compiti. Ministero delle politiche agricole alimentari e forestali. — https://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/8

OECD. 2020. Making Dispute Resolution More Effective – MAP Peer Review Report, Italy (Stage 2) Inclusive Framework on BEPS: Action 14. Organisation for Economic Co-operation and Development — https://www.oecd.org/tax/beps/making-dispute-resolution-more-effective-map-peer-review-report-italy-stage-2-08a4369e-en.htm

Proposal for a COUNCIL DECISION concerning the conclusion, on behalf of the European Union, of the amended Agreement for the establishment of the General Fisheries Commission for the Mediterranean /* COM/2014/0580 final - 2014/0274 (NLE) */ — https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52014PC0580

### 7.6.2 Principle 3 Performance Indicator scores and rationales

## PI 3.1.1 – Legal and/or customary framework

| PI 3.1.1 | | The management system exists within an appropriate legal and/or customary framework which ensures that it:<br>- Is capable of delivering sustainability in the UoA(s);<br>- Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and<br>- Incorporates an appropriate dispute resolution framework | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | **Compatibility of laws or standards with effective management** | | | |
| | Guide post | There is an effective national legal system **and a framework for cooperation** with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2 | There is an effective national legal system and **organised and effective cooperation** with other parties, where necessary, to deliver management outcomes consistent with MSC Principles 1 and 2. | There is an effective national legal system and **binding procedures governing cooperation with other parties** which delivers management outcomes consistent with MSC Principles 1 and 2. |
| | Met? | Yes | Yes | Yes |

Rationale

Italy has an effective national legal system and binding procedures listed within comprehensive suite of fisheries legislation that is updated to implement commitments under the EU's CFP and the under the GFCM.
A summary of this legislation is available at:
http://nationallegislation.gfcmsecretariat.org/index.php?title=Italy

This stock would appear to be a single jurisdiction in that it occurs in and is fished in GSA16.

For a UoA not subject to international cooperation for management of the stock this means:
*a. The existence of national laws, agreements and policies governing the actions of all the authorities and actors involved in managing the UoA, and*
*b. That these laws, agreements and/or policies provide a framework for cooperation between national entities (e.g., between regional and national management, state and federal management, indigenous and other groups) on national management issues, as appropriate for the context, size, scale or intensity of the UoA.*

In relation to a: Membership of the EU requires co-operation with other parties to deliver such management outcomes under the Common Fisheries Policy[98]. The fishery is managed within the context of the CFP and the Italian national system for fisheries management. At regional level, management of the fishery is based on multi stakeholder input from the Regional Advisory Bodies (here MEDAC). Scientific advice and input on various aspects of fisheries management and conservation is provided by the European Commission's Scientific, Technical and Economic Committee for Fisheries (STECF). The GFCM has the authority to adopt binding recommendations for fisheries conservation and management in its area of application and plays a critical role in fisheries governance in the region. In particular, its measures can relate to the regulation of fishing methods, fishing gear and minimum landing size, the establishment of open and closed fishing seasons and areas, and fishing effort control.

[98] https://www.guardiacostiera.gov.it/en/Pages/common-fisheries-policy.aspx

| PI 3.1.1 | The management system exists within an appropriate legal and/or customary framework which ensures that it:<br>- Is capable of delivering sustainability in the UoA(s);<br>- Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and<br>- Incorporates an appropriate dispute resolution framework |
|---|---|

In relation to b: Membership of the GFCM among Mediterranean countries also has binding procedures governing co-operation with other parties[99]. General Agreement on Establishment of the GFCM: "Further recognizing that, under international law, States are required to cooperate in the conservation and management of living marine resources and the protection of their ecosystems". Furthermore, recalling the Agreement for the Implementation of the Provisions of the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks of 4 December 1995, the Agreement to promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas of 24 November 1993, as well as other relevant international instruments concerning the conservation and management of living marine resources. There is an effective national legal system and binding procedures governing cooperation with other parties which delivers management outcomes consistent with MSC Principles 1 and 2. **SG 60, 80 and 100 may be met.**

| | **Resolution of disputes** | | | |
|---|---|---|---|---|
| **b** | Guide post | The management system incorporates or is subject by law to a **mechanism** for the resolution of legal disputes arising within the system. | The management system incorporates or is subject by law to a **transparent mechanism** for the resolution of legal disputes which is **considered to be effective** in dealing with most issues and that is appropriate to the context of the UoA. | The management system incorporates or is subject by law to a **transparent mechanism** for the resolution of legal disputes that is appropriate to the context of the fishery and has been **tested and proven to be effective**. |
| | Met? | Yes | Yes | No |

Rationale

Disputes in the fishery may be settled at two levels, the EU level and the national level in Italy.

The Court of Justice of the European Union (CJEU)[100] interprets EU law to make sure it is applied in the same way in all EU countries, and settles legal disputes between national governments and EU institutions. Common cases dealt with the CJEU include appropriate national interpretation of EU Law, national infringements with EU law, annulling EU legal acts that are in violation of other acts and treaties, ensuring the EU takes action, and sanctioning EU institutions in case of harm resulting from action or inaction. It can also, in certain circumstances, be used by individuals, companies or organisations to take action against an EU institution. If a company or an individual has suffered damage as a result of action or inaction by an EU institution or its staff, action can be taken in the Court, in one of two ways: i) indirectly through national courts (which may decide to refer the case to the Court of Justice); or ii) directly before the General Court (if a decision by an EU institution has affected the individual, company or organisation directly and individually).

At the wider Mediterranean level, an amendment of the GFCM Agreement[101] was launched in 2013 following a performance review finalised in 2011, which concluded that the Agreement should be amended to clarify the

[99] http://www.fao.org/gfcm/about/en/
[100] https://europa.eu/european-union/about-eu/institutions-bodies/court-justice_en
[101] http://www.fao.org/3/a-i5450e.pdf

| PI 3.1.1 | The management system exists within an appropriate legal and/or customary framework which ensures that it:<br>- Is capable of delivering sustainability in the UoA(s);<br>- Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and<br>- Incorporates an appropriate dispute resolution framework |
|---|---|

objectives and functions of the GFCM, and strengthen its efficiency, which included the establishment of a well-defined dispute settlement mechanism in case disputes arise between Contracting Parties. These were detailed in:
Article 19: Settlement of disputes on the interpretation and application of the Agreement
1. In the event of a dispute between two or more of Contracting Parties concerning the interpretation or application of this Agreement, the Parties concerned shall consult among each other with a view to seeking solutions by negotiation, mediation, inquiry or any other peaceful means of their own choice.
2. If the parties concerned cannot reach agreement in accordance with paragraph 19.1, they may jointly refer the matter to a committee composed of one representative appointed by each of the party of the dispute, and in addition the Chairperson of the Commission. The findings by such committee, while not binding in character, shall constitute the basis for renewed consideration by the Contracting Parties concerned of the matter out of which disagreement arose.
3. Any dispute concerning the interpretation or application of this Agreement not resolved under paragraphs 19.1 and 19.2 may, with the consent in each case of all parties to the dispute, be referred for settlement to arbitration. The results of the arbitration procedure shall be binding upon the parties.
4. In cases where the dispute is referred to arbitration, the arbitral tribunal shall be constituted as provided in the Annex to this Agreement. The Annex forms an integral part of this Agreement.

The Contracting Parties to the GFCM endorsed the "Amended Agreement for the establishment of the General Fisheries Commission for the Mediterranean" at the GFCM 38 Annual Session on 19-24 May 2014[102].

At the National level, the Italian legal system provides recourse for the resolution of disputes resulting from the management system. This can be applied at a local (Regional) and national level through the court system[103].

Accordingly, the management system incorporates or is subject by law to a transparent mechanism for the resolution of legal disputes which is considered to be effective in dealing with most issues and that is appropriate to the context of the UoA. **SG 60 and 80 would be met.** However, to date there is no evidence of this dispute resolution system being tested and proven to be effective. So SG100 may not be met.

| | | | | |
|---|---|---|---|---|
| | **Respect for rights** | | | |
| **c** | Guide post | The management system has a mechanism to **generally respect** the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2. | The management system has a mechanism to **observe** the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2. | The management system has a mechanism to **formally commit** to the legal rights created explicitly or established by custom of people dependent on fishing for food and livelihood in a manner consistent with the objectives of MSC Principles 1 and 2. |
| | Met? | Yes | Yes | No |
| Rationale | | | | |

[102] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A52014PC0580
[103] https://www.oecd.org/tax/beps/making-dispute-resolution-more-effective-map-peer-review-report-italy-stage-2-08a4369e-en.htm

| | |
|---|---|
| **PI 3.1.1** | **The management system exists within an appropriate legal and/or customary framework which ensures that it:**<br>**- Is capable of delivering sustainability in the UoA(s);**<br>**- Observes the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood; and**<br>**- Incorporates an appropriate dispute resolution framework** |

Within the EU, member states are obliged, according to the 2013 CFP[104], to include social and economic dimensions in their criteria for allocation of quota rights, among them the contribution to the local economy and historic catch levels (Art. 17). Protection of the interests of coastal communities dependent on fisheries is also one of the rationales for the principle of relative stability in fishing rights between the member states (Recital (35)). Among the objectives of the CFP (which are not legally binding, but an aid to interpretation) is to foster job creation and economic development in coastal areas (Recital (12)) and to contribute to a fair standard of living for those who depend on fishing activities, bearing in mind coastal fisheries and socio-economic aspects (Art. 2 f)). Marine biological resources in the outermost parts of the Union shall be secured special protection due their importance to the local economy, and certain types of fishing activities shall be limited to fishing vessels registered in the ports of those territories (Recital (21)).

At national level in Italy, there are a number of mechanisms to support the interests of smaller fishing vessels and coastal communities, including so-called Fishery Local Action Groups (FLAGs),[105] of which there is a number in Sicily, which design and implement a local development strategy to address economic, social and/or environmental needs. Based on their strategies, the FLAGs select and provide funding to local projects that contribute to local development in their areas, involving thousands of local stakeholders. The main objective of these FLAG is to promote fisheries, environmentally sustainable aquaculture and work to increase employment and territorial cohesion, promote the marketing and processing of fisheries and aquaculture products, promote the tourist appeal of the area and preserve cultural heritage.
Hence, the management system has a mechanism to generally respect the legal rights created explicitly or established by custom of people dependent on fishing for food or livelihood in a manner consistent with the objectives of MSC Principles 1 and 2. **SG 60 is met.** The system has a mechanism to observe such rights, so **SG 80 is also met.** It has not been documented that the mechanisms formally commit to these rights at the national level in Italy. SG 100 is not met.

| References |
|---|
| Please refer to the references and footnotes provided here and throughout the P3 background section. |

| Overall Performance Indicator (PI) Rationale | |
|---|---|
| Rationale is provided for each Scoring Issue. | |
| Draft scoring range | ≥80 |
| Information gap indicator | Information sufficient to score PI |

[104] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32013R1380
[105] https://webgate.ec.europa.eu/fpfis/cms/farnet2/on-the-ground/flag-factsheets-list_en

## PI 3.1.2 – Consultation, roles and responsibilities

| PI 3.1.2 | | The management system has effective consultation processes that are open to interested and affected parties<br>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | **Roles and responsibilities** | | | |
| | Guide post | Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **generally understood**. | Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for key areas** of responsibility and interaction. | Organisations and individuals involved in the management process have been identified. Functions, roles and responsibilities are **explicitly defined and well understood for all areas** of responsibility and interaction. |
| | Met? | Yes | Yes | No |
| Rationale | | | | |
| The P3 background section describes the various management, industry and scientific organisations involved in fisheries management. GFCM co-ordinates regional management and scientific data collection to inform fishery management[106].<br>The EC through the CFP sets framework for fisheries management, which is then implemented by the Italian ministry (implements the CFP and GFCM binding recommendations).<br>MEDAC is a multi-stakeholder group that feeds advice into these complementary processes. Federpesca and Federcoopesca are industry bodies representing the Italian catching sector as members of MEDAC[107].<br>The functions and relationships between these management, industry and advisory groups are, therefore explicitly defined and understood by key areas of responsibility. **SG 60 and 80 would be met.**<br>However, staff from the ministry did not make themselves available for interviews and we are uncertain as to whether functions, roles and responsibilities are explicitly defined and well understood for all areas of responsibility and interaction. Therefore SG 100 is not met. | | | | |
| b | **Consultation processes** | | | |
| | Guide post | The management system includes consultation processes that **obtain relevant information** from the main affected parties, including local knowledge, to inform the management system. | The management system includes consultation processes that **regularly seek and accept** relevant information, including local knowledge. The management system demonstrates consideration of the information obtained. | The management system includes consultation processes that **regularly seek and accept** relevant information, including local knowledge. The management system demonstrates consideration of the information and **explains how it is used or not used**. |
| | Met? | Yes | Yes | No |
| Rationale | | | | |

[106] http://www.fao.org/gfcm/about/en/
[107] http://en.med-ac.eu/membri.php

| PI 3.1.2 | The management system has effective consultation processes that are open to interested and affected parties<br>The roles and responsibilities of organisations and individuals who are involved in the management process are clear and understood by all relevant parties |
|---|---|

MEDAC is the main regular consultation process that enables local knowledge from the sector to be routinely considered in development of the management system. MEDAC at regional level and developing Fisheries Local Action Group (hereafter FLAG) at local level (in Sicily)[108], along with the development of the Better Regulation Guidelines[109] ensures more effective and routine consultation which is thought to be a recent improvement in performance. **Therefore, SG 60 and SG 80 are met.**

However, it is not always explained by MEDAC and the EC how that information is used or not used. Stakeholders suggest this is also the case at a national level with Ministry consultation exercises, which are ad hoc exercises associated with the development of new policies prior to the drafting of regulation.

However, this is not enough to consider that the management system considers always the information and explains how it is used or not use. Therefore, SG 100 is not met.

| | | | | |
|---|---|---|---|---|
| **c** | **Participation** | | | |
| | Guide post | | The consultation process **provides opportunity** for all interested and affected parties to be involved. | The consultation process provides **opportunity and encouragement** for all interested and affected parties to be involved, and **facilitates** their effective engagement. |
| | Met? | | Yes | No |

Rationale

The reform of the CFP[110] with a greater emphasis on regionalization and sea basin-level management, enhancing the role of the MEDAC at regional level and developing Fisheries Local Action Group (hereafter FLAG) at local level (in Sicily)[111], along with the development of the Better Regulation Guidelines[112] ensures more effective consultation and is a recent improvement in performance. In particular MEDAC is involved at regional level for the consultation on discard plan for various species. Therefore, the consultation process provides opportunity for all interested and affected parties (NGOs are also part of MEDAC) to be involved, **meeting SG80**.

However, it has not been documented that the authorities actively encourage all stakeholders, including environmental NGOs, to be involved and facilitate their effective engagement. SG 100 is not met.

References

Please refer to the references and footnotes provided here and throughout the P3 background section.

Overall Performance Indicator (PI) Rationale

Rationale is provided for each Scoring Issue.

| | |
|---|---|
| Draft scoring range | ≥80 |
| Information gap indicator | Information sufficient to score PI |

[108] https://webgate.ec.europa.eu/fpfis/cms/farnet2/on-the-ground/flag-factsheets-list_en

[109] https://ec.europa.eu/info/law/law-making-process/planning-and-proposing-law/better-regulation-why-and-how/better-regulation-guidelines-and-toolbox_en

[110] https://ec.europa.eu/fisheries/reform_en

[111] https://webgate.ec.europa.eu/fpfis/cms/farnet2/on-the-ground/flag-factsheets-list_en

[112] https://ec.europa.eu/info/law/law-making-process/planning-and-proposing-law/better-regulation-why-and-how/better-regulation-guidelines-and-toolbox_en

## PI 3.1.3 – Long term objectives

| PI 3.1.3 | | The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Fisheries Standard, and incorporates the precautionary approach | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | **Objectives** | | | |
| | Guide post | Long-term objectives to guide decision-making, consistent with the MSC Fisheries Standard and the precautionary approach, are **implicit** within management policy. | **Clear** long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach are **explicit** within management policy. | **Clear** long-term objectives that guide decision-making, consistent with MSC Fisheries Standard and the precautionary approach, are **explicit** within **and required by** management policy. |
| | Met? | Yes | Yes | Yes |

Rationale

The CFP Basic Document requires that member states, in accordance with international treaties such as the 1982 Law of the Sea Convention, the 1993 FAO Compliance Agreement and the 1995 Fish Stocks Agreement, apply the precautionary approach to fisheries management, and aim to ensure that exploitation of living marine biological resources restores and maintains populations of harvested species above levels which can produce the maximum sustainable yield (Recital (6), Art. 2)[113]. It is specifically mentioned that when targets relating to the maximum sustainable yield cannot be determined, multiannual (management) plans shall provide for measures based on the precautionary approach, ensuring at least a comparable level of protection for the relevant fish stocks (Art. 9). The maximum sustainable yield exploitation rate shall be achieved by 2015 where possible and, on a progressive, incremental basis at the latest by 2020 for all stocks (Art. 2).

The CFP and GFCM have clear long-term objectives that explicitly require the precautionary approach to be followed. GFCM General Agreement[114] Article 5:
In giving effect to the objective of this Agreement, the Commission shall:
a) adopt recommendations on conservation and management measures aimed at ensuring the long-term sustainability of fishing activities, in order to preserve the marine living resources, the economic and social viability of fisheries and aquaculture; in adopting such recommendations, the Commission shall give particular attention to measures to prevent overfishing and minimize discards. The Commission shall also pay particular attention to the potential impacts on small-scale fisheries and local communities;
c) apply the precautionary approach in accordance with the 1995 Agreement and the Code of Conduct for Responsible Fisheries. Therefore **SG 60, 80 and 100 would be met.**

References

Please refer to the references and footnotes provided here and throughout the P3 background section.

Overall Performance Indicator (PI) Rationale

Rationale is provided for each Scoring Issue.

| Draft scoring range | ≥80 |
|---|---|

[113] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02013R1380-20190814
[114] http://www.fao.org/3/a-i5450e.pdf

| PI 3.1.3 | The management policy has clear long-term objectives to guide decision-making that are consistent with MSC Fisheries Standard, and incorporates the precautionary approach |
|---|---|
| Information gap indicator | Information sufficient to score PI |

## PI 3.2.1 – Fishery-specific objectives

| PI 3.2.1 | | The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2 | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | **Objectives** | | | |
| | Guide post | **Objectives**, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **implicit** within the fishery-specific management system. | **Short and long-term objectives**, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **explicit** within the fishery-specific management system. | **Well defined and measurable short and long-term objectives**, which are demonstrably consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are **explicit** within the fishery-specific management system. |
| | Met? | Yes | No | No |

Rationale

In 2011 the Italian Ministry of Agricultural, Food and Forestry Policies (hereafter MIPAFF) approved (Decreto Dirett. 20 settembre 2011 n. 6) a management plan (MIPAFF, 2011[115]) specific for fishing vessels registered in the Sicilian maritime compartments that practice purse seine fishing. In the same plan management measures are also provided for those trawlers, provisionally authorized to use pelagic pair trawl, based in the port of Sciacca which operate exclusively in GSA 16. The objective of the management plan is to recover the stocks within biological safety limits. The MP clearly states the need to make the methods and intensity of the harvest compatible with the potential for biological renewal of the species involved in this fishery. The plan aims to achieve, in the case of small pelagic, an improvement in sustainability by controlling the exploitation rate and monitoring the amount of biomass available. The objective can be achieved through the implementation of the adjustment plan envisaged by the national Operational Program associated with the measures referred in the management plan. Such objectives are in general (but not full) agreement with CFP requirements. However, more precise objectives in line with key CFP requirements would help the fishery achieve higher MSC scores in this indicator.

This management plan includes limitations on fishing effort in terms of days at sea. In particular, specific attention is given to the possibility of establishing a system that regulates the removal of biomass from the sea according to market needs, since it has been found that the product offer often occurs in an uncoordinated and discontinuous way with consequent waste of biological and financial resources. This objective requires the introduction of specific management rules as the establishment of a coordination Producer Organizations (POs) who takes responsibility for the definition and compliance with the rules relating to fishing, in particular as regards to fishing times and the quantities of catches allowed to vessels of the entire purse seine and pelagic pair trawl fleets. The management plan called for:

1) 3% reduction in effort,
2) Fishing season from 15th of March to 15th of November,
3) Fishing permits,
4) Data collection (fleet capacity, effort, CPUE, biological data such as length, age and discards).

115 https://www.politicheagricole.it/flex/cm/pages/ServeAttachment.php/L/IT/D/4%252Fe%252Fb%252FD.cfa0001a323ee507c000/P/BLOB%3AID%3D6896/E/pdf

| PI 3.2.1 | The fishery-specific management system has clear, specific objectives designed to achieve the outcomes expressed by MSC's Principles 1 and 2 |
|---|---|
| Objectives, which are broadly consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are implicit within the fishery-specific management system. **SG 60 is met.**<br><br>However due to the lack of more specific evidence and objectives in the management plan (that would ideally be fully consistent with CFP key requirements) we cannot determine that short and long-term objectives, which are consistent with achieving the outcomes expressed by MSC's Principles 1 and 2, are explicit within the fishery-specific management system. SG 80 may not be met. | |
| References | |
| Please refer to the references and footnotes provided here and throughout the P3 background section. | |
| Overall Performance Indicator (PI) Rationale | |
| Rationale is provided for each Scoring Issue. | |
| Draft scoring range | 60-79 |
| Information gap indicator | Information insufficient to score PI:<br><br>• Specific objective in the management plan and how they relate to the management of the target stock and ecosystem components. |

## PI 3.2.2 – Decision-making processes

| PI 3.2.2 | | The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | **Decision-making processes** | | | |
| | Guide post | There are **some** decision-making processes in place that result in measures and strategies to achieve the fishery-specific objectives. | There are **established** decision-making processes that result in measures and strategies to achieve the fishery-specific objectives. | |
| | Met? | Yes | No | |
| Rationale | | | | |
| The GFCM develops binding recommendations that are required to be implemented by the GFCM contracting parties. Those recommendations are drafted based on advice from the Scientific Advisory Council (SAC)[116], which is the only body able to provide advice directly to the GFCM. Submissions from other parties (e.g. European Union) can also be taken into account. The GFCM checks compliance by those parties required to implement binding recommendations and reports on the extent to which this has been achieved.<br>Italy developed a management plan for small pelagics fisheries in GSA 16, in 2011. This represents somewhat of a formulation of a decision-making processes specific to Italy and the fishery in question that resulted in measures (e.g. fishing effort restrictions) and strategies (data collection, scientific advice, effort restriction, etc.) to achieve some fisheries objectives (effort reduction). **Therefore SG 60 is met.** However, the assessment team is not aware of any other significant arrangements following 2011 (e.g. no GFCM decision specific to this fishery since 2005)[117] to determine that there are established decision-making processes that result in measures and strategies to achieve the fishery-specific objectives. SG 80 may not be met. | | | | |
| b | **Responsiveness of decision-making processes** | | | |
| | Guide post | Decision-making processes respond to **serious issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take some account of the wider implications of decisions. | Decision-making processes respond to **serious and other important issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions. | Decision-making processes respond to **all issues** identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions. |
| | Met? | Yes | No | No |
| Rationale | | | | |

[116] http://www.fao.org/gfcm/about/structure/sac/en/
[117] http://www.fao.org/gfcm/decisions/en/

| PI 3.2.2 | The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery |
|---|---|

The decision making process in MIPAAF that led to the creation of the 2011 management plan for small pelagics in GSA 16[118] responded to serious issues identified in research and monitoring activities by a disarmament plan which provides for the overall reduction of 3% of the fishing capacity registered in the Sicilian compartments and authorized for purse seine, a reduction in fishing days from 20 to 18 days per month, catch limit set at 6,000 boxes of anchovies per month per individual purse seine vessel, and minimum sizes on landing. The management plan was created to allow recovery of the anchovy and sardine stocks within biological safety limits. **SG 60 is met.**

We note, however, the lack of Opinions from MEDAC [119] and the absence of GFCM decisions[120] specific to this stock, despite challenges relating to achieving credible stock assessment results (see 2019 stock assessment report), or the need to better integrate potential ecosystem needs in the assessment framework, which does not allow us at the moment, to determine that decision-making processes respond to serious and other important issues identified in relevant research, monitoring, evaluation and consultation, in a transparent, timely and adaptive manner and take account of the wider implications of decisions. SG 80 may not be met.

| | | | | |
|---|---|---|---|---|
| | **Use of precautionary approach** | | | |
| c | Guide post | | Decision-making processes use the precautionary approach and are based on best available information. | |
| | Met? | | Yes | |

Rationale

In accordance with the CFP[121] decision-making processes are based on the precautionary approach and the best scientific available.

Furthermore, the GFCM decision making processes are designed with the precautionary approach in mind. The 2019 WGSASP report[122] further describes that during the joint session, Mr Miguel Bernal, GFCM senior fishery officer, presented a working proposal for the revision of the GFCM framework for the provision of advice. As a consequence of the issues identified (i.e. growing need to provide advice based on data-limited methods, establishment of benchmark sessions requiring the definition of reference points and performance of short-term forecasts, as well as the possibility of adopting a catch limit approach), the forty-third session of the Commission had agreed to launch a process for revising and updating the framework for the provision of advice. In order to initiate the discussion, the following terms of reference were proposed:

i. Reviewing frameworks for the provision of advice in other RFMOs and advisory bodies;
ii. Addressing the provision of advice for data-limited situations and the formulation of precautionary advice;
iii. Specifying procedures for the estimation of reference points in different data availability situations;
iv. Formulating a procedure for the performance of forecasts and MSE when needed.

[118] https://www.politicheagricole.it/flex/cm/pages/ServeAttachment.php/L/IT/D/4%252Fe%252Fb%252FD.cfa0001a323ee507c000/P/BLOB%3AID%3D6896/E/pdf

[119] http://en.med-ac.eu/pareri_lettere.php

[120] http://www.fao.org/gfcm/decisions/en/

[121] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:32013R1380#:~:text=The%20CFP%20shall%20apply%20the,produce%20the%20maximum%20sustainable%20yield.

[122] http://www.fao.org/gfcm/technical-meetings/detail/en/c/1274635/

| PI 3.2.2 | The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery |
|---|---|

**SG80 would be met.**

| | | | | |
|---|---|---|---|---|
| | **Accountability and transparency of management system and decision-making process** | | | |
| d | Guide post | Some information on the fishery's performance and management action is generally available on request to stakeholders. | **Information on the fishery's performance and management action is available on request**, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity. | Formal reporting to all interested stakeholders **provides comprehensive information on the fishery's performance and management actions** and describes how the management system responded to findings and relevant recommendations emerging from research, monitoring, evaluation and review activity. |
| | Met? | Yes | Yes | No |

Rationale

There is no hindrance to available information being made available to stakeholders as scientific information, management decisions and other aspects of fisheries management are publicly available on the internet. Furthermore, MEDAC consults with its members as so do FLAGs within Sicily and other platforms that collect and use stakeholder input. Information on the fishery's performance and management action is available on request, and explanations are provided for any actions or lack of action associated with findings and relevant recommendations emerging from research, monitoring, evaluation and review activity. **SG 60 and 80 would be met.**

However, it is not clear if there is reporting to all interest stakeholders. SG 100 is not met.

| | | | | |
|---|---|---|---|---|
| | **Approach to disputes** | | | |
| e | Guide post | Although the management authority or fishery may be subject to continuing court challenges, it is not indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery. | The management system or fishery is attempting to comply in a timely fashion with judicial decisions arising from any legal challenges. | The management system or fishery acts proactively to avoid legal disputes or rapidly implements judicial decisions arising from legal challenges. |
| | Met? | Yes | Yes | Yes |

Rationale

The assessment team is not aware of the management authority being subject to continuing court challenges or indicating a disrespect or defiance of the law by repeatedly violating the same law or regulation necessary for the sustainability for the fishery. The management system or fishery would appear to attempt to comply in a timely

| PI 3.2.2 | The fishery-specific management system includes effective decision-making processes that result in measures and strategies to achieve the objectives, and has an appropriate approach to actual disputes in the fishery |
|---|---|
| fashion with judicial decisions arising from any legal challenges. The management authority works proactively to avoid legal disputes through the tight cooperation with user-groups at the regulatory level, ensuring as high legitimacy as possible for regulations and other management decisions. Only the most serious cases go to prosecution by the police and possible transfer to the court system[123]. **SG 60, 80 and 100 would be met.** | |
| References | |
| Please refer to the references and footnotes provided here and throughout the P3 background section. | |
| Overall Performance Indicator (PI) Rationale | |
| Rationale is provided for each Scoring Issue. | |
| Draft scoring range | 60-79 |
| Information gap indicator | Information insufficient to score PI:<br>• More information on decision making process and responses to serious issues is required |

[123] https://www.oecd.org/tax/beps/making-dispute-resolution-more-effective-map-peer-review-report-italy-stage-2-08a4369e-en.htm

## PI 3.2.3 – Compliance and enforcement

| PI 3.2.3 | | Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| a | **MCS implementation** | | | |
| | Guide post | Monitoring, control and surveillance **mechanisms** exist, and are implemented in the fishery and there is a reasonable expectation that they are effective. | A monitoring, control and surveillance **system** has been implemented in the fishery and has demonstrated an ability to enforce relevant management measures, strategies and/or rules. | A **comprehensive** monitoring, control and surveillance system has been implemented in the fishery and has demonstrated a consistent ability to enforce relevant management measures, strategies and/or rules. |
| | Met? | Yes | No | |

Rationale

Monitoring, control and surveillance in the fishery is conducted by the EU member states through their national enforcement bodies. The EU Commission conducts controls by dispatching Community inspectors to check on member states´ control activities and to ensure that EU rules are being followed. The European Fisheries Control Agency (EFCA), established in 2005, coordinates the EU member state's fisheries control and inspection activities and provides assistance in the application of the CFP. The Mediterranean is one of the area subject to the Joint Development Plan (JDP) inspection framework of ECFA[124].

The EU system for fisheries control is laid out in the Control Regulation, which entered into force on 1 January 2010[125] [126]. The Regulation applies to all activities covered by the CFP carried out on the territory of member states or in EU waters, and by EU fishing vessels or nationals of a member state (Art. 2). It requires all member states to adopt appropriate measures, allocate adequate financial, human and technical resources and set up all administrative and technical structures necessary for ensuring control, inspection and enforcement of activities under the CFP (Art. 5). The Regulation contains Titles ('sections' above chapter level) on, among other things, access to waters and resources (Title III), control of fisheries (Title IV), control of marketing (Title V), surveillance (Title VI), inspections and proceedings (Title VII), enforcement (Title VIII) and common control programmes (Title IX). Among the substantial requirements are that member states operate a vessel monitoring system (VMS) and an automatic identification system (AIS), to be generally applied by vessels above 12 and 15 meters, respectively (Art. 9, 10), and that they make the use of fishing logbooks mandatory for all vessels above 10 meters (Art. 14) and electronic logbook for all vessels above 12 meters (Art. 15). The Regulation also introduces an obligation of member states to employ real-time closure of fisheries (Art. 51-54). Further, member states are obliged to carry out monitoring of fishing activities by inspection vessels or surveillance aircraft (Art. 71) and physical inspections of fishing vessels (Art. 74-77); in addition to national inspectors, a pool of Community inspectors shall also be set up (Art. 79). Procedures are established for situations where infringements are detected (Art. 82-88), including enhanced follow-up when infringements are serious, such as mis-recording of catches of more than 500 kg or 10 % of what is reported in the logbook (Art. 84). Further, provisions are given for proceedings (Art. 85-88) and sanctions (Art. 90-93).

At national level MCS in the Mediterranean is a combination of technical measures geared inspection such as the requirement for Vessel Monitoring Systems (VMS) on vessels over 12m (all UoA vessels) and e-logbooks. This is supported by at sea inspection, aerial surveillance and port inspection. Control authorities have a reasonable

[124] https://www.efca.europa.eu/sites/default/files/EFCA%20AYIR_DEF_Digital.pdf
[125] https://ec.europa.eu/fisheries/cfp/control_en
[126] https://www.europarl.europa.eu/factsheets/en/sheet/116/fisheries-control-and-enforcement

| PI 3.2.3 | Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with | | | |
|---|---|---|---|---|

expectation and confidence that MCS measures are effective. The resources available to and used by those authorities have demonstrated an ability to enforce the regulations applying to the fishery.
The Italian Coastguard manages monitoring control and surveillance of Italian vessels[127]. An interview with a fishery representative highlighted that the Coast Guard is often seen patrolling the waters and vessels targeting anchovies and sardines and that there was a general expectation that fishermen are generally compliant with the key regulations in place.

However, we note that such anecdotal evidence cannot be verified as relevant statistics on sanctions and inspections are not available for the UoA but only for the whole Italian fleets on "*Ecomafie*" report 2018 (https://www.legambiente.it/rapporto-ecomafia). Therefore, is not possible to demonstrate the efficacy of the MCS mechanism but it is possible just to infer an expectation of efficacy, SG 60 would be met but 80 may not be.

| | | | | |
|---|---|---|---|---|
| **b** | **Sanctions** | | | |
| | Guide post | Sanctions to deal with non-compliance exist and there is some evidence that they are applied. | Sanctions to deal with non-compliance exist, **are consistently applied** and thought to provide effective deterrence. | Sanctions to deal with non-compliance exist, are consistently applied and **demonstrably** provide effective deterrence. |
| | Met? | Yes | No | |

Rationale

Sanctions for non-compliances exist and are applied since records exist, at least from an EFCA perspective (refer to page 12 of the 2019 EFCA Year in Review[128], showing a 5-year average of just above 10% suspected infringements/Inspections between 2014 and 2019). **SG 60 is met.** However, we note that the assessment team was unable to speak to Ministry/Coast Guard representatives as these parties did not make themselves available to invitations for interviews. Also, data from the *Ecomafie* report is aggregated for the whole Italian fleets. Accordingly. we cannot determine at this point if sanctions to deal with non-compliance exist, are consistently applied and thought to provide effective deterrence. **SG 80 is not met.**

| | | | | |
|---|---|---|---|---|
| **c** | **Compliance** | | | |
| | Guide post | Fishers are **generally thought** to comply with the management system for the fishery under assessment, including, when required, providing information of importance to the effective management of the fishery. | **Some evidence exists** to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery. | There is a **high degree of confidence** that fishers comply with the management system under assessment, including, providing information of importance to the effective management of the fishery. |
| | Met? | Yes | No | |

Rationale

The statistics on inspection and infringements are not directly available for the present UoA but we have no reason to doubt that fishers would be generally thought to comply with management system rules and regulations for the

[127] https://www.guardiacostiera.gov.it/en/Pages/common-fisheries-policy.aspx
[128] https://www.efca.europa.eu/sites/default/files/EFCA%20AYIR_DEF_Digital.pdf

| PI 3.2.3 | Monitoring, control and surveillance mechanisms ensure the management measures in the fishery are enforced and complied with | | | |
|---|---|---|---|---|
| fishery under assessment, including, when required, providing information of importance to the effective management of the fishery. **SG 60 is likely met.** However, due to lack of data highlighted earlier, we cannot determine that some evidence exists to demonstrate fishers comply with the management system under assessment, including, when required, providing information of importance to the effective management of the fishery. **SG 80 is not met.** | | | | |
| **d** | **Systematic non-compliance** | | | |
| | Guide post | | There is no evidence of systematic non-compliance. | |
| | Met? | | No | |
| Rationale | | | | |
| Due to the lack of specific evidence or information from stakeholders, we cannot determine, at this stage that there is no evidence of systematic non-compliance. **SG80 may not be met.** | | | | |
| References | | | | |
| Please refer to the references and footnotes provided here and throughout the P3 background section. | | | | |
| Overall Performance Indicator (PI) Rationale | | | | |
| Rationale is provided for each Scoring Issue. | | | | |
| Draft scoring range | | | 60-79 | |
| Information gap indicator | | | More information sought:<br>• Enforcement information specific to the fishery in question | |

## PI 3.2.4 – Monitoring and management performance evaluation

| PI 3.2.4 | | There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives<br>There is effective and timely review of the fishery-specific management system | | |
|---|---|---|---|---|
| Scoring Issue | | SG 60 | SG 80 | SG 100 |
| **a** | **Evaluation coverage** | | | |
| | Guide post | There are mechanisms in place to evaluate **some** parts of the fishery-specific management system. | There are mechanisms in place to evaluate **key** parts of the fishery-specific management system. | There are mechanisms in place to evaluate **all** parts of the fishery-specific management system. |
| | Met? | Yes | No | No |
| Rationale | | | | |
| In terms of scientific advice, the mechanism in place to evaluate some parts of the fishery-specific management system are the scientific working groups (both in the framework of SAC-GFCM and STECF) evaluation the status of the stocks, which then result in recommendations for fishery specific management measures.. Hence, there are mechanisms in place to evaluate some parts of the fishery-specific management system. SG 60 is met. However, the assessment team is not aware of additional mechanism to review other components (e.g. enforcement, fishery management plan revisions). **Therefore SG 80 is not met at this point.** | | | | |
| **b** | **Internal and/or external review** | | | |
| | Guide post | The fishery-specific management system is subject to **occasional internal** review. | The fishery-specific management system is subject to **regular internal** and **occasional external** review. | The fishery-specific management system is subject to **regular internal and external** review. |
| | Met? | Yes | No | No |
| Rationale | | | | |
| The European Commission reports annually to the European Parliament and to the Council on the status in EU fisheries management. There is also regular internal review within the Commission. External review can be considered to result from the scrutiny applied by the EC as a GFCM contracting party, along with the opportunity for other parties and the multi-stakeholder group, MEDAC, to review and comment. For example, the 2019 meeting of WGSASP[129] was attended by 41 participants from GFCM member countries and by representatives of the FAO regional projects and the European Commission (DG MARE), as well as the GFCM Secretariat. During benchmark sessions the use of external reviewers is common and in 2019 an external reviewer was recommended for the GSA 1 benchmark session. In regard to other components of the management system (e.g. at the MIPAAF or Coast Guard level), and although internal review of key management organisations is assumed to occur at least occasionally, it is not clear at this point if there is regular internal, and occasional external review of those. SG 60 would be met but additional evidence from MIPAAF and other fishery managers would be required to elucidate the current review arrangements and potentially reach SG80 requirements. | | | | |

129 https://gfcm.sharepoint.com/EG/Report%20v2/Forms/AllItems.aspx?id=%2FEG%2FReport%20v2%2F2019%2FWGSASP%2FGFCM%5FWGSASP%5F2019%5FReport%2Epdf&parent=%2FEG%2FReport%20v2%2F2019%2FWGSASP&p=true&originalPath=aHR0cHM6Ly9nZmNtLnNoYXJlcG9pbnQuY29tLzpiOi9nL0VHL0VXTEhzZ05HWFp4SnBBdHlvbEpwdDZ3QmQ0TExHNjFqT2VsRmR6ZEhVaHR6b0E_cnRpbWU9Tk1oVTAtYWEyRWc

| PI 3.2.4 | There is a system of monitoring and evaluating the performance of the fishery-specific management system against its objectives<br>There is effective and timely review of the fishery-specific management system |
|---|---|
| References | |
| Please refer to the references and footnotes provided here and throughout the P3 background section. | |
| Overall Performance Indicator (PI) Rationale | |
| Rationale is provided for each Scoring Issue. | |
| Draft scoring range | 60-79 |
| Information gap indicator | Information not sufficient to score PI.<br>More information is required to substantiate the management system review internal/external review processes and how that works towards evaluation of key parts of the fishery-specific management system, as needed. |

# 8 Appendices

## 8.1 Assessment information

### 8.1.1 Small-scale fisheries

**Table 16.** Small-scale fisheries.

| Unit of Assessment (UoA) | Percentage of vessels with length <15m | Percentage of fishing activity completed within 12 nautical miles of shore |
|---|---|---|
| Current UoA | All the vessels identified in the UoA are likely 15 metres or more in length. These are: Purse seine (PS) vessels including:<br><br>M/P MAMMA CATERINA 3PE 735<br>M/P SAN PIETRO 3PE 689<br>M/P SAN PIETRO II 3PE 742<br>M/P RITA MADRE II 3PE 718<br>Operating from Trapani to Portopalo di Capo Passero. Port of reference: Sciacca (TP). | It is likely that most operators fish within 12 nm of shore. |

## 8.2 Evaluation processes and techniques

### 8.2.1 Site visits

The assessment team organised conference calls as part of the remote "site visits" envisioned for this project to collect information about this fishery and to better frame the pre-assessment. A series of calls took place between September and November 2020. We note that representatives of the Ministry/Coast Guard did not make themselves available for this pre-assessment, and we were not able to speak with fishermen or industry representatives. A meeting with the following stakeholders was held.

**Table 17.** Itinerary of meetings including names of organisations and individuals consulted remotely.

| Meeting | Date | Meeting | Attendants | Expertise |
|---|---|---|---|---|
| 1 | 16/11/2021 | General Fisheries Commission for the Mediterranean (GFCM) - RFMO | Paolo Carpentieri | Fishery resources monitoring, scientific surveys and bycatch expert |
| | | | Elisabetta Morello | Fishery resources officer |
| | | | Vito Romito | Lead Assessor (P2 and P3) – Global Trust Certification (GTC) |
| | | | Giuseppe Scarcella | Assessor (P1 and P3) – GTC Contracted Expert |
| | | | Ilaria Vielmini | Client – MSC Italy |
| 2 | 16/11/2021 | Carlino srl - Industria Ittico Conserviera / Processing | Nino Carlino | Processor and President of the Fishing District |
| | | | Vito Romito | Lead Assessor (P2 and P3) – Global Trust Certification (GTC) |
| | | | Giuseppe Scarcella | Assessor (P1 and P3) – GTC Contracted Expert |
| 3 | 17/11/2020 | Consiglio Nazionale delle Ricerche (CNR) – Science Organisation | Walter Basilone | Fishery Researcher (anchovy stock assessor) |
| | | | Vito Romito | Lead Assessor (P2 and P3) – Global Trust Certification (GTC) |
| | | | Giuseppe Scarcella | Assessor (P1 and P3) – GTC Contracted Expert |
| 4 | 17/11/2020 | WWF Italy / Mediterranean Advisory Council MEDAC | Alessandro Buzzi | WWF Fisheries Manager / MEDAC vice Chairmen |
| | | | Vito Romito | Lead Assessor (P2 and P3) – Global Trust Certification (GTC) |

### 8.2.2 Recommendations for stakeholder participation in full assessment

As well as recommending the same people interviewed during the pre-assessment, the assessment team recommends that the following additional stakeholders be interviewed:

1. Fishermen using purse seine nets and midwater trawls
2. Supply chain operators including other anchovy processors/buyers
3. MIPAAF
4. Coast Guard
5. Federpesca and/or Federcoopesca
6. Other experts/researchers to deal with issues relating to accidental catches and ETP species interactions

## 8.3 Risk-Based Framework outputs

### 8.3.1 Consequence Analysis (CA)

**Table 18.** Consequence Analysis (CA) scoring template *Engraulis encrasicolus.*

| | Scoring element | Consequence subcomponents | Consequence score |
|---|---|---|---|
| Principle 1: Stock status outcome | *Engraulis encrasicolus* | Population size | 80 |
| | | Reproductive capacity | |
| | | Age/size/sex structure | |
| | | Geographic range | |
| Rationale for most vulnerable subcomponent | Population size was considered the most vulnerable subcomponent based on the impact of exploitation patterns on biomass as stated by STECF 2013and confirmed also during the interview with the experts of the echo-survey. | | |
| Rationale for consequence score | Acoustic surveys which estimate biomass and distribution of anchovy are carried out every year since 1998 (Figure 7 and Figure 8). Such data, combined with landings data (Figure 6), provide trends showing that a stable status of the stock it can be confirmed, considering also the wide fluctuation of biomass in period with high fishing pressure (2005-2010; **Error! Reference source not found.**). The effort and capacity reductions occurred after 2011 as foreseen in the Italian management plan (MIPAAF, 2011) have probably maintained the stock at high productive levels with relative good recruitment. Therefore, changes to the population as a consequence of fishing are detectable but are overall limited against the natural variability. | | |

### 8.3.2 Productivity Susceptibility Analysis (PSA)

**Table 19.** Productivity Susceptibility Analysis (PSA) productivity attributes and scores *Engraulis encrasicolus.*

| Performance Indicator | 1.1.1 | |
|---|---|---|
| **Productivity** | | |
| Scoring element (species) | *Engraulis encrasicolus* | |
| **Attribute** | Rationale | Score |
| Average age at maturity | Sexual maturity is reached at the end of the first year and by all individuals within the second year of life (see: https://www.fishbase.se/Reproduction/MaturityList.php?ID=66&GenusName=Engraulis&SpeciesName=encrasicolus&fc=454 ) | **1** |
| Average maximum age | In the Strait of Sicily the average maximum age is approximately 4 years (see: https://www.fishbase.se/popdyn/PopCharList.php?ID=66&GenusName=Engraulis&SpeciesName=encrasicolus&fc=454). | **1** |
| Fecundity | The fecundity is comprised between 2000 and 20,000 eggs (see: https://www.fishbase.se/Reproduction/FecundityList.php?ID=66&GenusName=Engraulis&SpeciesName=encrasicolus&fc=454&StockCode=76 | **2** |
| Average maximum size<br>Not scored for invertebrates | The average maximum size is around 19 cm (see: https://www.fishbase.se/popdyn/PopCharList.php?ID=66&GenusName=Engraulis&SpeciesName=encrasicolus&fc=454) | **1** |
| Average size at maturity<br>Not scored for invertebrates | The average maximum size at maturity is 11 cm (see: https://www.fishbase.se/Reproduction/MaturityList.php?ID=66&GenusName=Engraulis&SpeciesName=encrasicolus&fc=454 ) | **1** |
| Reproductive strategy | The species is a broadcast spawner (Donato et al., 2017) | **1** |
| Trophic level | The trophic level is 3.36 (Table 9) | **3** |
| Density dependence<br>Invertebrates only | - | **-** |
| **Susceptibility** | | |
| Fishery<br>Only where the scoring element is scored cumulatively | *Purse seine* | |
| **Attribute** | Rationale | Score |
| Areal Overlap | Taking into account the large distribution area of anchovy in the strait of Sicily (Figure 5 - Annual maps of anchovy density distribution in the Strait of Sicily during summertime. The position of the centres of gravity and the main spatial patches (contributing > 10% to abundance) are shown. The 200 m isobath is indicated by a continuous line. Source: modified from Barra et al., 2015Figure 5) and the areas of closure foreseen in MIPAFF 2011 the areal overlap is considered to be between 10-30%. | **2** |
| Encounterability | Default value | **3** |
| Selectivity of gear type | Taking into account data available in Table 8, individuals smaller than size at maturity (11.2 cm) are regularly caught | **2** |
| Post capture mortality | Default value | **3** |
| Catch (weight)<br>Only where the scoring element is scored cumulatively | 1,364 tons (2019 FDI data call) | |
| Fishery | *Pelagic pair trawl* | |

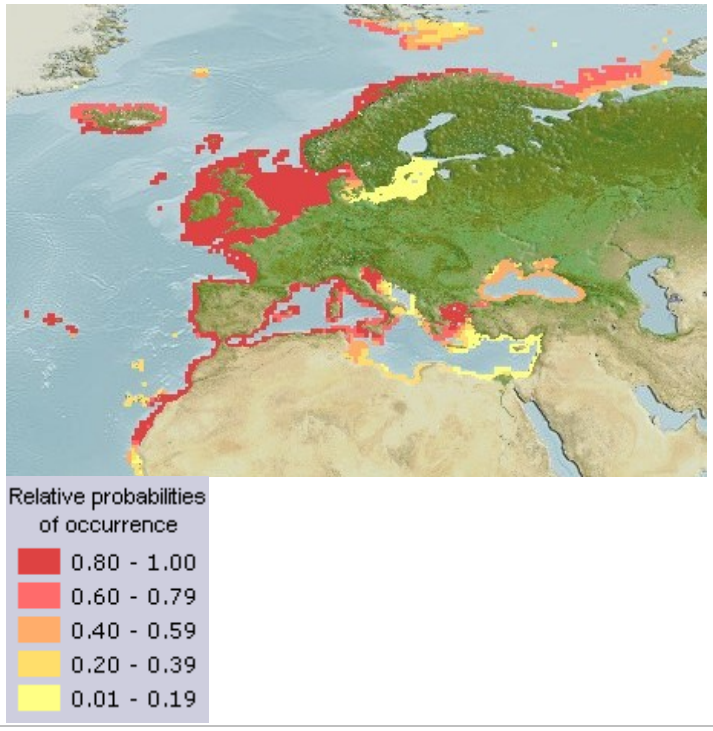
| **Table 19.** Productivity Susceptibility Analysis (PSA) productivity attributes and scores *Engraulis encrasicolus.* | | |
|---|---|---|
| Only where the scoring element is scored cumulatively | | |
| **Attribute** | Rationale | Score |
| Areal Overlap | Taking into account the large distribution area of anchovy in the strait of Sicily (Figure 5 - Annual maps of anchovy density distribution in the Strait of Sicily during summertime. The position of the centres of gravity and the main spatial patches (contributing > 10% to abundance) are shown. The 200 m isobath is indicated by a continuous line. Source: modified from Barra et al., 2015Figure 5) and the areas of closure foreseen in MIPAFF 2011 the areal overlap is considered to be between 10-30%. | **2** |
| Encounterability | Default value | **3** |
| Selectivity of gear type | Taking into account data available in Table 8, individuals smaller than size at maturity (11.2 cm) are regularly caught | **2** |
| Post capture mortality | Default value | **3** |
| Catch (weight)<br>Only where the scoring element is scored cumulatively | 1,677 tons (2019 FDI data call) | |
| Fishery<br>Only where the scoring element is scored cumulatively | Bottom trawl | |
| **Attribute** | Rationale | Score |
| Areal Overlap | Taking into account the large distribution area of anchovy in the strait of Sicily (Figure 5 - Annual maps of anchovy density distribution in the Strait of Sicily during summertime. The position of the centres of gravity and the main spatial patches (contributing > 10% to abundance) are shown. The 200 m isobath is indicated by a continuous line. Source: modified from Barra et al., 2015Figure 5) and the areas of closure foreseen for bottom trawl fishery (Russo et al., 2014) the areal overlap is considered to be between 10-30%. | **2** |
| Encounterability | The fishing activity is targeting demersal stocks and the bottom trawl net shows usually a vertical opening of around 2-3m while the anchovy is distributed along the whole water column. Therefore, the vertical overlap is medium. | **2** |
| Selectivity of gear type | Taking into account data available in Table 8, individuals smaller than size at maturity (11.2 cm) are regularly caught | **2** |
| Post capture mortality | Default value | **3** |
| Catch (weight)<br>Only where the scoring element is scored cumulatively | 96 tons (2019 FDI data call) | |

| | | | | | | | Productivity Scores [1-3] | | | | | | | | Susceptibility Scores [1-3] | | | | | | Cumulative only | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Scoring element | First of each scoring element | Family name | Scientific name | Common name | Species type | Fishery descriptor | Average age at maturity | Average max age | Fecundity | Average max size | Average size at Maturity | Reproductive strategy | Trophic level | Density Dependance | Total Productivity (average) | Availability | Encounterability | Selectivity | Post-capture mortality | Total (multiplicative) | PSA Score | Catch (tons) | Weighting | Weighted Total | Weighted PSA Score | MSC PSA-derived score | Risk Category Name | MSC scoring guidepost | Consequence Score (CA) | Final MSC score (per scoring element) |
| 1 | First | Engraulidae | Engraulis encrasicolus | European anchovy | Non-invertebrate | Purse seine | 1 | 1 | 2 | 1 | 1 | 1 | 3 | | 1.43 | 2 | 3 | 2 | 3 | 1.88 | 2.36 | 1364 | 1.00 | 2.36 | 2.36 | 88 | Low | ≥80 | 80 | 84 |
| 2 | First | Engraulidae | Engraulis encrasicolus | European anchovy | Non-invertebrate | Pelagic pair trawl | 1 | 1 | 2 | 1 | 1 | 1 | 3 | | 1.43 | 2 | 3 | 2 | 3 | 1.88 | 2.36 | 1677 | 1.00 | 2.36 | 2.36 | 88 | Low | ≥80 | 80 | 84 |
| 3 | First | Engraulidae | Engraulis encrasicolus | European anchovy | Non-invertebrate | Bottom trawl | 1 | 1 | 2 | 1 | 1 | 1 | 3 | | 1.43 | 2 | 2 | 2 | 3 | 1.58 | 2.13 | 96 | 1.00 | 2.13 | 2.13 | 93 | Low | ≥80 | 80 | 87 |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | MSC score | 85 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | Status | conditional Pa | |

**P2 species PSA.**

For the PSA performed on sardine (main secondary species) is shown below.

| **Table 20.** Productivity Susceptibility Analysis (PSA) productivity attributes and scores *Sardina pilchardus.* | | |
|---|---|---|
| Performance Indicator | 2.2.1 | |
| **Productivity** | | |
| Scoring element (species) | European pilchard (*Sardina pilchardus*) – information taken from Fishbase' Life History Toolkit[130] | |
| **Attribute** | Rationale | Score |
| Average age at maturity | 1.7 years | **1** |
| Average maximum age | 5.9 years | **1** |
| Fecundity | 156,525 [ 50,000-490,000 ] Estimated as geometric mean. | **1** |
| Average maximum size<br>Not scored for invertebrates | 27.5 cm | **1** |
| Average size at maturity<br>Not scored for invertebrates | 10.5 cm | **1** |
| Reproductive strategy | nonguarders: open water/substratum egg scatterers | **1** |
| Trophic level | 3.1 | **2** |
| Density dependence<br>Invertebrates only | N/A | **-** |
| **Susceptibility** | | |
| Fishery<br>Only where the scoring element is scored cumulatively | *Purse seine* | |
| **Attribute** | Rationale | Score |
| Areal Overlap | European pilchard is common in the western part of the Mediterranean and in Adriatic Sea, and rare in the eastern part; also present in the Sea of Marmara and Black Sea.<br>  <br> | **2** |

130 https://www.fishbase.se/popdyn/KeyfactsSummary_1.php?ID=1350&GenusName=Sardina&SpeciesName=pilchardus&vStockCode=1368&fc=43

**Table 20.** Productivity Susceptibility Analysis (PSA) productivity attributes and scores *Sardina pilchardus.*

| | | |
|---|---|---|
| | Computer generated distribution maps for *Sardina pilchardus* (European pilchard), with modelled year 2050 native range map based on IPCC RCP8.5 emissions scenario. www.aquamaps.org, version 10/2019.<br><br>Aeral overlap is estimated at 10-30% | |
| Encounterability | Sardine form schools, usually at depths of 25 to 55 or even 100 m by day, rising to 10 to 35 m at night. This depth matches the gear deployment depth of the purse seine fishery. A high overlap with fishing gear (high encounterability) is estimated. | **3** |
| Selectivity of gear type | For surrounding nets the minimum mesh size shall be 14 mm. *Sardina pilchardus* has a minimum landing size (MLS) of 11 cm. Individuals < size at maturity would be frequently caught. | **3** |
| Post capture mortality | Sardine would be retained species. Retained species or majority dead when released. Default score of 3 for retained species (Principle 1 or Principle 2). | **3** |
| Catch (weight)<br>Only where the scoring element is scored cumulatively | NA | **-** |
| Fishery<br>Only where the scoring element is scored cumulatively | *NA* | |

Sardine achieves an MSC PSA-derived score of 84, as shown below:

| | | | | | Productivity Scores [1-3] | | | | | | | | | Susceptibility Scores [1-3] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Family name** | **Scientific name** | **Common name** | **Species type** | **Fishery descriptor** | Average age at maturity | Average max age | Fecundity | Average max size | Average size at Maturity | Reproductive strategy | Trophic level | Density Dependance | Total Productivity (average) | Availability | Encounterability | Selectivity | Post-capture mortality | Total (multiplicative) | **MSC PSA-derived score** | Risk Category Name | MSC scoring guidepost |
| Clupeidae | Sardina pilchardus | Sardine | Non-invert. | Purse seine | **1** | **1** | **1** | **1** | **1** | **1** | **2** | | **1.14** | **2** | **3** | **3** | **3** | **2.33** | **84** | **Low** | **≥80** |

# 9 Template information and copyright

This document was drafted using the 'MSC Pre-Assessment Reporting Template v3.2'. Note amendments have been made to formatting in order to comply with SAI Global's corporate identity; however, content and structure follow that of the original template.



**Template version control**

| Version | Date of publication | Description of amendment |
|---|---|---|
| 1.0 | 15 August 2011 | Date of first release |
| 1.1 | 31 October 2013 | Updated in line with changes to CR v1.3 |
| 2.0 | 08 October 2014 | Confirmed background sections (Section 3) as optional (use of 'may' statements).<br><br>Modified Table 6.3 to create a simplified scoring sheet to be completed in place of full evaluation tables<br><br>Made amendments to PIs based on Fishery Standard Review changes (e.g. removed original PIs 1.1.2, 3.1.4 and 3.2.4). |
| 2.1 | 9 October 2017 | Inclusion of optional full evaluation tables |
| 3.0 | 17 December 2018 | Release alongside Fisheries Certification Process v2.1 |
| 3.1 | 29 March 2019 | Minor document changes for usability |
| 3.2 | 25 March 2020 | Release alongside Fisheries Certification Process v2.2. |

A controlled document list of MSC program documents is available on the MSC website (www.msc.org).

Senior Policy Manager
Marine Stewardship Council
Marine House
1 Snow Hill
London EC1A 2DH
United Kingdom

Phone: + 44 (0) 20 7246 8900
Fax: + 44 (0) 20 7246 8901
Email: standards@msc.org