A5.25x Communities of Mediterranean very shallow circalittoral fine sand

Summary

Clean fine sands either on the open coast or in tide-swept channels of marine inlets in depths of over 15-20m. The habitat may also extend offshore. The infauna is characterised by a wide range of cnidarians, echinoderms, polychaetes and bivalves,

This habitat can be impacted from coastal human activities, mainly demersal trawl fishing as well as sand mining, which alter seabed structure and biodiversity. In the past, this habitat was impacted by different coastal human activities such us dumping of solid wastes or other pollutants, but in many areas this is now prohibited. The level of trawling and dredging as fishing activites causing the highest negative effect, has significantly decreased in this shallow zone all over the Mediterranean, with the prohibition on the use of towed gears close to the coast. Improving spatial and strategic planning of human activities, in particular aquaculture, and sand mining, as well as regulation discharges to the marine environment and continuing management of fishing activity benefit this habitat.

Synthesis

This habitat has a widespread distribution in the Mediterranean. It is known to be impacted from coastal human activities which alter seabed structure and biodiversity. The use of towed gears (trawls, dredges etc,) has recently been prohibited within 3 nautical miles of the coast or within the 50 m isobath where that depth is reached at a shorter distance from the coast. Thus, major negative fishing effects should decline in shallow circallitoral areas where this habitat is present. Other pressures and threats, from pollution and aquaculture remain. Declines over the last 50 years cannot be quanitified but expert opinion is that this is likely to have been fairly substantial. This habitat has therefore been assessed as Near Threatened under criteria C/D for the EU 28 and EU 28+.

Overall Category & Criteria			
EU 28		EU 28+	
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Near Threatened	C/D1	Near Threatened	C/D1

Sub-habitat types that may require further examination

None.

Habitat Type

Code and name

A5.25x Communities of Mediterranean very shallow circalittoral fine sand

No characteristic photographs of this habitat are currently available.

Habitat description

Clean fine sands either on the open coast or in tide-swept channels of marine inlets in depths of over 15-20m. The habitat may also extend offshore and is characterised by a wide range of cnidarians, echinoderms, polychaetes and bivalves as part of the infauna.This habitat is generally more stable than shallower infralittoral sands, as there is less fluctuation in temperature and salinity.

Indicators of quality:

There are no commonly agreed indicators of quality for this habitat, thus both standard biotic and abiotic indicators have been used to describe marine habitat quality. In certain areas habitat can be under impact of fisheries activities, particularly trawling and dredging, thus the presence of characteristic commercially exploited species may indicate a quality of the habitat.

Characteristic species:

Characteristic species are bivalves: *Tellina pulchella, Spisula subtruncata,* Chamelea gallina; polychaets: *Aricidea cerrutii, Prionospio caspersi, Scolelepis squamosus;* echinoids*: Echinocardium cordatum;* bony fish*: Trachinus draco.*

Classification

EUNIS (v1405):

Level 4. A sub-habitat of Circalittoral Sand (A5.2).

Annex 1:

1110 Sandbanks slightly covered with sea water all the time

1160 Large shallow inlets and bays

MAES:

Marine - Marine inlets and transitional waters

Marine - Coastal

MSFD: Shallow sublittoral sand

EUSeaMap:

Shallow sands

IUCN:

9.4 Subtidal sandy

9.5 Subtidal sandy-mud

Does the habitat type present an outstanding example of typical characteristics of one or more biogeographic regions?

Unknown

Justification

Geographic occurrence and trends

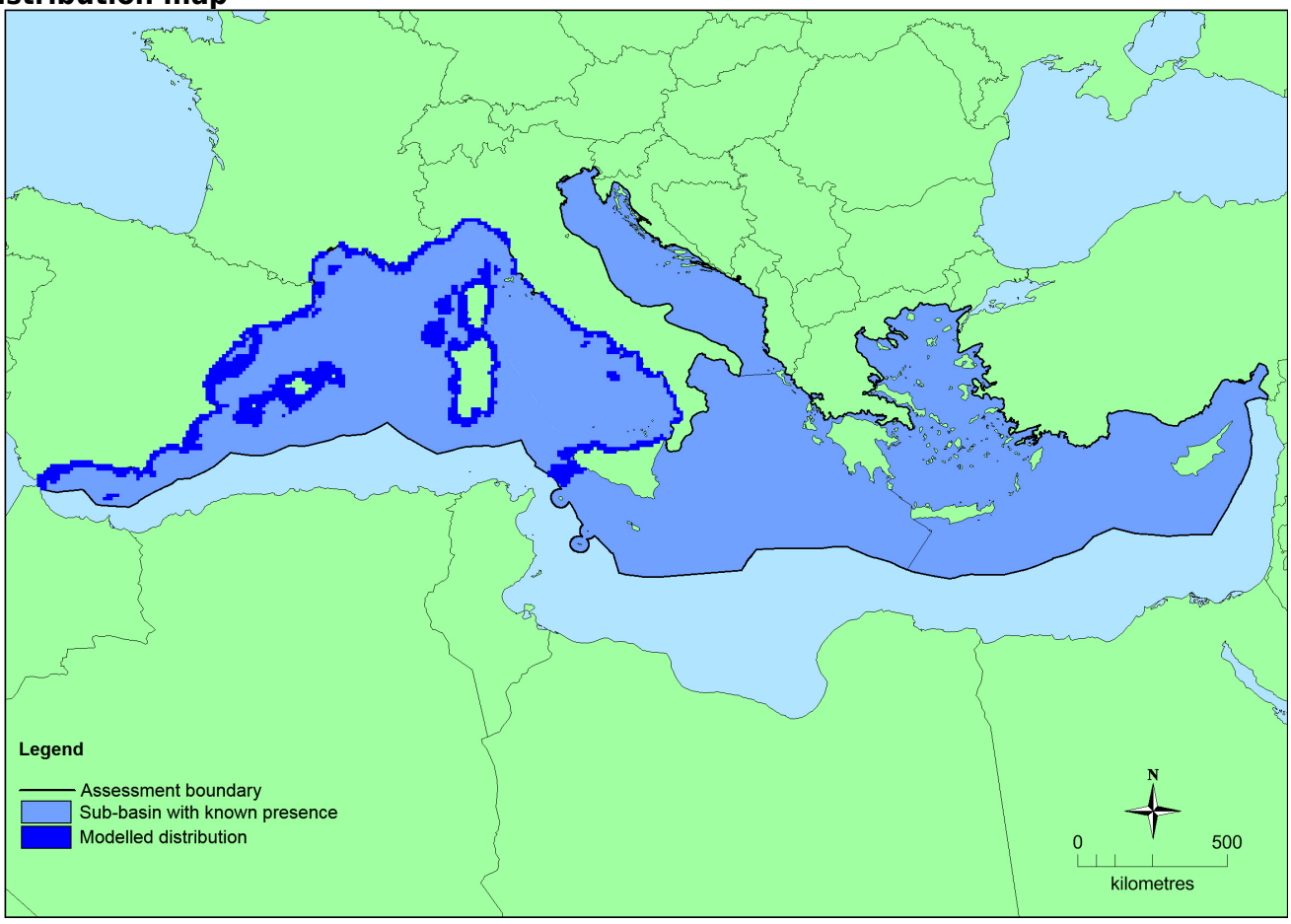
Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)

Region	Present or Presence Uncertain	Current area of habitat	Recent trend in quantity (last 50 yrs)	Recent trend in quality (last 50 yrs)
Mediterranean Sea	Adriatic Sea: Present Aegian-Levantine Sea: Present Ionian Sea and the Central Mediterranean Sea: Present Western Mediterranean Sea: Present	Unknown Km^2	Unknown	Decreasing

Extent of Occurrence, Area of Occupancy and habitat area

	Extent of Occurrence (EOO)	Area of Occupancy (AOO)	Current estimated Total Area	Comment
EU 28	1,050,357 Km^2	1,411	Unknown Km^2	EOO and AOO have been calculated on the available data. Although this data set is known to be incomplete the figures exceed the thresholds for threatened status.
EU 28+	>1,050,357 Km^2	>1,411	Unknown Km^2	EOO and AOO have been calculated on the available data. Although this data set is known to be incomplete the figures exceed the thresholds for threatened status.

Distribution map



There are insufficient data to provide a comprehensive and accurate map of the distribution of this habitat.This map has been generated using EMODnet data from modelled/surveyed records for the western Mediterranean (and supplemented with expert opinion where applicable) (EMODnet 2010). EOO

and AOO have been calculated on the available data presented in this map however these should be treated with caution as expert opinion is that this is not the full distribution of the habitat.

How much of the current distribution of the habitat type lies within the EU 28?

It is unknown how much of this habitat is hosted by the EU 28 in the Mediterranean but it does occur in the EU 28+.

Trends in quantity

This habitat is common in the Mediterranean and known to be widely distributed although there is a lack of information on the precise area of coverage. There are no reports about the trends on this habitat from individual countries and specific information regarding the trends of the different sub-habitats is missing. There have changes in the extent of this habitat in particular locations due to human interventions. For example about 45 % of the sediments that would be delivered by rivers to the Mediterranean annually are either retained behind dams or extracted from river beds for sand and gravel, leading to an overall deficit of sediments on the coast. Groynes and breakwaters, seawalls and jetties built along naturally low sedimentary shores have also caused severe losses and alterations of shallow sedimentary habitats. The overall trend for this habitat throughout the EU 28 and EU 28+ is unknown.

- Average current trend in quantity (extent)
  EU 28: Unknown
  EU 28+: Unknown
- Does the habitat type have a small natural range following regression?
  No
  Justification
  The habitat has an EOO larger than 50,000 km^2 .
- Does the habitat have a small natural range by reason of its intrinsically restricted area?
  No
  Justification
  The habitat has an EOO larger than 50,000 km^2 .

Trends in quality

The continental shelf area in the EU Mediterranean countries is almost all subject to a high intensity of trawled gear fishing increasing on an east to west gradient with the highest intensity and extent in the Adriatic Sea. Studies in particular locations have shown declines in quality of this habitat, for example associated with aquaculture and demersal fisheries which have affected both species composition and abundance. Degraded water quality, for example through eutrophication has also affected some locations. These threats are both current and are likely to continue to cause declines in quality of this habitat. Fishing impacts may reduce in the future following the introduction of legislation which prohibits the use of certain gears within 3nm of the coast.

- Average current trend in quality
  EU 28: Decreasing
  EU 28+: Decreasing

Pressures and threats

Heavy fishing disturbs sandy bottoms, causing dramatic changes in the structure of both the physical support system and the related biological assemblages. It has been noted that trawls and dredges scrape or plough the seabed, resuspend sediment, change grain size and sediment texture, destroy bedforms, and remove or scatter non-target species. To these effects can be added the increase in the amount of suspended nutrients and organic matter. Apart of direct effects related to the use of bottom gears indirect

effects on the ecosystem may extend far beyond the direct impact zone. Eutrophic processes may be enhanced leading to hypoxia in sensitive soft bottom areas (as in the northern Adriatic) and the quantity of hydrogen sulphide released from sediments may increase. The anthropic re-suspension of sediment enriched in organic matter can eliminate macrophyte, benthos and demersal fish approaching their hypoxia tolerance limit; the changed ecosystem structure favours species adapted or tolerant to hypoxic conditions. Trawling and dredging can also play a role affecting the intensity and duration of naturally occurring seasonal hypoxic crises in some places. In the north Adriatic Sea the first signs of hypoxia started around 1960 and developed into severe anoxic events over the past decades. Coastal development including the construction of coastal defences and jetties can also have effects offshore for example by altering the hydrodynamic characteristics. Sand extraction is an additional pressure on this habitat.

List of pressures and threats

Mining, extraction of materials and energy production

Mining and quarrying
Sand and gravel extraction

Urbanisation, residential and commercial development

Urbanised areas, human habitation
Discharges

Biological resource use other than agriculture & forestry

Marine and Freshwater Aquaculture
Fishing and harvesting aquatic resources

Pollution

Marine water pollution
Soil pollution and solid waste (excluding discharges)

Natural System modifications

Human induced changes in hydraulic conditions
Modification of hydrographic functioning, general

Conservation and management

In the past, this habitat was impacted by different coastal human activities such us dumping of solid wastes or other pollutants, but in many areas such situations are currently prohibited. The level of trawling and dredging as fishing activites causing highest negative effects has decreased significantly in this shallow zone all over the Mediterranean, as according to fishery regulations the use of towed gears (trawls, dredges etc,) is prohibited within 3 nautical miles of the coast or within the 50 m isobath where that depth is reached at a shorter distance from the coast. With such regulation, that is implemented in most of Mediterranean national legislations, major negative fishing effect stopped in many of shallow circallitoral areas.

Improving spatial and strategic planning of human activities, in particular aquaculture and sand mining, as well as regulation discharges to the marine environment and contining management of fishing activities would benefit this habitat.

List of conservation and management needs

Measures related to wetland, freshwater and coastal habitats

Restoring/Improving water quality

Measures related to marine habitats

Restoring marine habitats

Measures related to spatial planning

Establish protected areas/sites
Legal protection of habitats and species

Measures related to hunting, taking and fishing and species management

Regulation/Management of fishery in marine and brackish systems

Conservation status

Annex 1:

1110 MMED XX

1160 MMED XX

When severely damaged, does the habitat retain the capacity to recover its typical character and functionality?

The capacity of this habitat to recover after being severely damaged is unknown.

Effort required

Red List Assessment

Criterion A: Reduction in quantity

Criterion A	A1	A2a	A2b	A3
EU 28	unknown %	unknown %	unknown %	unknown %
EU 28+	unknown %	unknown %	unknown %	unknown %

This habitat can be impacted from coastal human activities which alter seabed structure and biodiversity. However, recently, many different regulations have significantly decreased pollution and other human activites, especially fishing with trawls and dredges that were having a major negative effect on this habitat. Although changes have been noted in some locations, the overall trend in quantity is unknown. This habitat has therefore been assessed as Data Deficient under criteria A for both the EU 28 and EU 28+.

Criterion B: Restricted geographic distribution

Criterion B	B1				B2				B3
	EOO	a	b	c	AOO	a	b	c	
EU 28	>50,000 Km^2	Yes	Yes	No	>50	Yes	Yes	No	No
EU 28+	>50,000 Km^2	Yes	Yes	No	>50	Yes	Yes	No	No

This habitat is present in the Eastern and Western Mediterranean basins. The precise extent is unknown but estimated as EOO >50,000km^2 and AOO >50 which exceeds the thresholds for a threatened category on the basis of restricted geographic distribution. The habitat is known to have declined in quality although this cannot be quantified at the present time and this trend is considered likely to continue. The nature and size of threats to this habitat and the distribution data which are available suggest that no known

threats are likely to affect all localities at once. This habitat has therefore been assessed as Least Concern under criterion B.

Criterion C and D: Reduction in abiotic and/or biotic quality

Criteria C/D	C/D1		C/D2		C/D3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	close to VU treshold %	fairly substantial r %	unknown %	unknown %	unknown %	unknown %
EU 28+	close to VU treshold %	fairly substantial r %	unknown %	unknown %	unknown %	unknown %

Criterion C	C1		C2		C3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %
EU 28+	unknown %	unknown %	unknown %	unknown %	unknown %	unknown %

Criterion D	D1		D2		D3	
	Extent affected	Relative severity	Extent affected	Relative severity	Extent affected	Relative severity
EU 28	unknown %	unknown%	unknown %	unknown%	unknown %	unknown%
EU 28+	unknown %	unknown%	unknown %	unknown%	unknown %	unknown%

This habitat can be impacted from coastal human activities which alter seabed structure and biodiversity. The use of towed gears (trawls, dredges etc,) has recently been prohibited within 3 nautical miles of the coast or within the 50 m isobath where that depth is reached at a shorter distance from the coast. Thus, major negative fishing effects should decline in shallow circallitoral areas where this habitat is present. Other pressures and threats, from pollution and aquaculture remain. Declines over the last 50 years cannot be quanitified but expert opinion is that this is likely to have been fairly substantial. This habitat has therefore been assessed as Near Threatened under criteria C/D.

Criterion E: Quantitative analysis to evaluate risk of habitat collapse

Criterion E	Probability of collapse
EU 28	unknown
EU 28+	unknown

There is no quantitative analysis available to estimate the probability of collapse of this habitat type. Therefore, it is assessed as Data Deficient under Criterion E.

Overall assessment "Balance sheet" for EU 28 and EU 28+

	A1	A2a	A2b	A3	B1	B2	B3	C/D1	C/D2	C/D3	C1	C2	C3	D1	D2	D3	E
EU28	DD	DD	DD	DD	LC	LC	LC	VU	DD	DD	DD	DD	DD	DD	DD	DD	DD
EU28+	DD	DD	DD	DD	LC	LC	LC	VU	DD	DD	DD	DD	DD	DD	DD	DD	DD

Overall Category & Criteria	
EU 28	EU 28+

Overall Category & Criteria			
Red List Category	Red List Criteria	Red List Category	Red List Criteria
Near Threatened	C/D1	Near Threatened	C/D1

Confidence in the assessment
Low (mainly based on uncertain or indirect information, inferred and suspected data values, and/or limited expert knowledge)

Assessors
A. Soldo.

Contributors
-

Reviewers
S.Gubbay and N.Sanders.

Date of assessment
13/01/2016

Date of review
21/04/2016

References

Airoldi, L. 2003. The effects of sedimentation on rocky coast assemblages. *Oceanography and Marine Biology: An Annual Review* 41: 161-236.

Airoldi, L. and Beck, M.W. 2007. Loss, status and trends for coastal marine habitats of Europe. *Oceanography and Marine Biology: An Annual Review* 45: 345-405.

Albertelli, G. and Cattaneo, M. 1985. Macrobenthos dei fondi molli del Mar Ligure. *Proceedings of the VI Symposium of the Italian Association of Oceanography and Limnology (AIOL)*: 87-98.

Albertelli, G., Covazzi-Harriague, A., Danovaro, R., Fabiano, M., Fraschetti, S. and Pusceddu, A. 1999. Differential responses of bacteria, meiofauna and macrofauna in a shelf area (Ligurian Sea, NW Mediterranean): role of food availability. *Journal of Sea Research* 42: 11-26.

Bakran Petricioli, T. 2007. *Marine habitats-Manual for mapping and monitoring*. State Institute for Nature Protection. 60 pp.

Bellan, G., Bourcier, M., Salen-Picard, C., Arnoux, A. and Casserley, S. 1999. Benthic ecosystem changes associated with wastewater treatment at Marseille: Implications for the protection and restoration of the Mediterranean Coastal Shelf ecosystems. *Water Environment Research* 71(4): 483-493.

Blum, W.E.H. 2009. Reviewing land use and security linkages in the Mediterranean region. In: *Water scarcity, land degradation and desertification in the Mediterranean region.* Rubio, J., Safriel, U., Daussa, R., Blum, W. and Pedrazzini, F. (Eds.). Springer, Dordrecht, the Netherlands. pp 101-117.

Bombace, G. 2001. Influence of climatic changes on stocks, fish species and marine ecosystems in the Mediterranean sea. *Archivio di Oceanografia e Limnologia* 22: 67-72.

Bressan, G., Chemello, R., Gravina, M.F., Gambi, M.C., Peirano, A., Cocito, S., Rosso, A. and Tursi, A. 2009. Other bioconcretions. In: *Other types bioconstructions.* Relini, G. (Ed.). Friuli Museum of Natural History, Udine, Italy. pp 90-114.

Dolenec, T., Lojen, S., Kniewald, G., Dolenec, M. and Rogan, N. 2007. Nitrogen stable isotope composition as a tracer of fish farming in invertebrates *Aplysina aerophoba*, *Balanus perforatus* and *Anemonia sulcata* in central Adriatic. *Aquaculture* 262: 237-249.

Dounas, C.G. and Koukouras, A.S. 1992. Circalittoral macrobenthic assemblages of Strymonikos Gulf (North Aegean Sea). P.S.Z.N.I. *Marine Ecology* 13(2): 85-99.

EEA. 2006a. *The Changing Faces of Europe's Coastal Areas.* EEA Report 6/2006. OPOCE, Luxembourg.

EEA. 2006b. *Priority Issues in the Mediterranean Environment.* EEA Report 4/2006. OPOCE, Luxembourg.

EEA/UNEP. 1999. *State and pressures of the marine and coastal Mediterranean environment.* European Environment Agency, Copenhagen.

Falace, A., Alongi, G., Cormaci, M., Furnari, G., Curiel, D., Cecere, E. and Petrocelli, A. 2010. Changes in the benthic algae along the Adriatic Sea in the last three decades. *Chemical Ecology* 26: 77-90.

Gabrié, C., Lagabrielle, E., Bissery, C., Crochelet, E., Meola, B., Webster, C., Claudet, J., Chassanite, A., Marinesque, S., Robert, P., Goutx, M. and Quod, C. 2012. *The Status of Marine Protected Areas in the Mediterranean Sea*. MedPAN & RAC/SPA (Eds.). MedPAN Collection. 256 pp.

Gabriele, M., Bellot, A., Gallotti, D. and Brunetti, R. 1999. Sublittoral hard substrate communities of the Northern Adriatic Sea. *Cahiers de Biologie Marine* 40(1): 65-76.

Jeftic, L., Bernhard, M., Demetropulous, A., Fernex, F., Gabrielides, G.P., Gasparovic, F., Halim, Y., Orhon, D. and Saliba, L.J. 1990. *State of the Marine Environment in the Mediterranean Region.* UNEP Regional Seas Reports and Studies 132/1990 and MAP Technical Reports Series 28/1989. Athens.

MEPA. 2012. *MSFD Initial Assessment: Benthic Habitats*. MEPA. 86 pp.

Salen-Picard, C., Bellan, G., Bellansantini, D., Arlhac, D. and Marquet, R. 1997. Long-term changes in a benthic community of a Mediterranean gulf (Gulf of Fos). *Oceanologica Acta* 20(1): 299-310.

Salomidi, M., Katsanevakis, S., Damalas, D., Mifsud, R., Todorova, V., Pipitone, C., Fernandez, T.V., Mirto, S., Galparsoro, I., Pascual, M., Borja, A., Rabaut, M. and Braeckman, U. 2010. *Catalogue of European seabed biotopes.* Report of Deliverable 1.2 of MESMA project to the European Commission.

Salomidi, M., Katsanevakis, S., Borja, A., Braeckman, U., Damalas, D., Galparsoro, I., Mifsud, R., Mirto, S., Pascual, M., Pipitone, C., Rabaut, M., Todorova, V., Vassilopoulou, V. and Vega Fernández, T. 2012. Assessment of goods and services, vulnerability, and conservation status of European seabed biotopes: a stepping stone towards ecosystem-based marine spatial management. *Mediterranean Marine Science* 13: 49-88.

Simboura, N. and Zenetos, A. 2002. Benthic indicators to use in ecological quality classification of Mediterranean soft bottoms marine ecosystems, including a new biotic index. *Mediterranean Marine Science* 3/2: 77-111.

Stachowitsch, M. 1984. Mass Mortality in the Gulf of Trieste: The Course of Community Destruction. *Marine Ecology* 5(3): 243-264.

UNEP. 2006. *Classification of benthic marine Habitat types for the Mediterranean Region.* UNEP (OCA)/MED WG 149/5 Rev. 1.

UNEP/MAP. 2003. *Concept Paper on Mediterranean Marine Pollution Indicators.* (UNEP(DEC)/MED WG.231/17).

UNEP/MAP/PAP. 2001. White Paper: *Coastal Zone Management in the Mediterranean.* Priority Actions Programme, Split.

UNEP/MAP. 2012a. *Initial integrated assessment of the Mediterranean Sea: Fulfilling step 3 of the ecosystem approach process.* United Nations Environment Programme, Mediterranean Action Plan, Barcelona Convention, Athens.

UNEP/MAP. 2012b. *State of the Mediterranean Marine and Coastal Environment.* United Nations Environment Programme, Mediterranean Action Plan, Barcelona Convention, Athens.

Vespe M, Gibin M, Alessandrini A, Natale F, Mazzarella F, & Osio G. *in press.* Mapping EU fishing activities using ship tracking data – accepted for publication, *Journal of Maps* – available at *http://arxiv.org/pdf/1603.03826*

Vezzulli, L., Chelossi, E., Riccardi, G. and Fabiano, M. 2002. Bacterial community structure and activity in fish farm sediments of the Ligurian Sea (Western Mediterranean). *Aquaculture International* 10: 123-141.