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MARINE PROTECTED AREAS MANAGEMENT: INTERACTION WITH COMMERCIAL FISHERIES IN NATURA 2000 SITES ALONG THE ROMANIAN BLACK SEA COAST

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ABSTRACT

As a Member State, Romania has implemented the Birds and Habitats Directives (79/409/EEC and 92/43/EEC) through national legislation (Emergency Ordinance no. 57/2007, Minister's of Environment and Forests Order no. 2387/2011, amending Minister's of Environment and Sustainable Development no. 1964/2007 and, recently, Minister's of Environment, Waters and Forests no. 46/2016). Pursuant to the most recent legislative document, there are 9 Sites of Community Interest (SCIs) along the Romanian Black Sea coast, The extension and creation of new Natura 2000 site in the Romanian EEZ at the Black Sea was made by overlapping with pre-existing traditional economic activities, mainly fishing, but also offshore oil and gas exploitation.

The main traditional areas covered by the new Natura 2000 Marine Protected Areas (MPAs) include pelagic trawl fishing areas, turbot gillnets set-up zones and beam trawling areas. Moreover, other uses of the maritime space are affected by this extension, namely offshore activities. The main traditional areas for offshore activities covered by the new Natura 2000 sites include drilling platforms, oil and gas pipelines and exploration oil fields.

It is obvious that this overlapping of MPAs on existing activities has generated limitations and constraints of economic activities, which resulted in conflicts of interest between fishermen communities and environmental protection authorities. Under such circumstances, the amicable settlement of economic and conservation interests should be made using compromise solutions: one of these solutions could be the differentiated zoning of Natura 2000 sites. Some of these areas would allow certain activities, while others would limit/ban them temporarily or permanently.

Key-Words: MPAs, traditional activities, fisheries, overlapping, conflict resolution

AIMS AND BACKGROUND

Since 1992, the European Union has promoted as the main nature conservation tool the development of the Natura 2000 European Ecological Network of protected areas, targeting both EU and candidate countries. Initially, the process of designating sites within the network was scheduled to be completed by the year 2000, but this process was more or less delayed in different countries. The realization of the Natura 2000 European Ecological Network is based on two European Union directives, the Habitats Directive and the Birds Directive, which regulate the way of selecting and designating and protecting sites, and Member States have the right to regulate the practical implementation of the provisions of the Directives at national level (Zaharia et al., 2010).

As a Member State, Romania has implemented the Birds and Habitats Directives (79/409/EEC and 92/43/EEC) through national legislation (Emergency Ordinance no. 57/2007, Minister's of Environment and Forests Order no. 2387/2011, amending Minister's of Environment and Sustainable Development no. 1964/2007 and, recently, Minister's of Environment, Waters and Forests no. 46/2016).

Natura 2000 is an ecological network of Natura 2000 sites of two types: Special Areas of Conservation (SAC), established under the Habitats Directive, and Special Protection Areas (SPAs) established under the Directive Birds (Todorova et al., 2008).

In the Black Sea region, marine protected areas (Natura 2000 and national/international/regional) were reviewed in recent years in the frame of two European projects: "MSFD Guiding Improvements in the Black Sea Integrated Monitoring System" MISIS (EC DG Env. Project -MISIS: No 07.020400/2012/616044/SUB/D2) and "Towards COast to Coast NETworks of marine protected areas (from the shore to the high and deep sea), coupled with seabased wind energy potential" CoCoNET (FP7 Grant Agreement No. 287844).

Despite the availability of best practices in nature conservation governance worldwide and of numerous guidelines for marine protected areas management, incorporating them into national law and policy remains a challenge for Black Sea MPAs. The main gaps identified in Romania, Bulgaria and Turkey, for instance, include areas where legislation and policy are missing. Furthermore, the mismatches between the written law/policy and what is being applied in practice by local people are also discussed (Begun et al., 2012). Moreover, habitat mapping and species distribution (marine mammals, fish, seabirds) for the Black Sea MPAs were collected and integrated in a web GIS database at the level of 2015 (Boero et al., 2016).

Whereas in Romania new legislation issued in 2016 resulted in the extension of existing MPAs and the establishment of new ones, an updated review of the MPAs along the Romanian Black Sea coast is a necessary endeavor, all the more so this extensions has resulted in conflicts on the use of maritime space.

The process of selecting, establishing and managing MPAs requires careful planning and sensitive management. It should be inclusive, thus providing a fair representation of stakeholders e involved in planning and in sharing responsibility for managing the MPA (whenever possible).

EXPERIMENTAL

The protected sites are identified and declared on a scientific basis (in accordance with the procedures of the two above mentioned Directives) in order to maintain in a favorable conservation status a representative area of the most important types of habitats (listed in Annex I of the Habitats Directive) and representative species of Europe (listed in Annex II of the Habitats Directive and Annex I of the Birds Directive) (Sundseth, 2014).

According to the Romanian legislation, the areas included in the Natura 2000 network fall into the following categories: Sites of Community Importance - SCIs; Special Areas of Conservation - SACs; Special Protection Areas - SPAs. Sites of Community Importance (SCIs) are declared by Member States for the protection and conservation of species and habitats of Community interest until their acceptance as Special Areas of Conservation by the European Union. Special Areas of Conservation are delineated for the protection and conservation of the species and habitats listed in Annex II of the Habitats Directive or for their return to favorable conservation status (Stanciu & Florescu, 2009).

The designation of these protected areas has not started from the idea of strict protection that prohibits any human activity. On the contrary, Natura 2000 sites are environmentally sustainable areas of conservation, aiming at the preservation of natural habitats and/or species for which the site has been declared, and the development of human activities is made taking into account certain conservation requirements (Zaharia et al., 2012 b). Natura 2000 sites involve actual conservation measures and management measures for which the involvement of stakeholders is mandatory. The main objective of nature conservation is to create a balance between conservation and social, economic and cultural needs, so Natura 2000 does not exclude human activities as long as they are not in contradiction with protection objectives (Zaharia et al., 2014).

The process of establishing the Natura 2000 network is continuous and does not end with the designation of the respective protected site. The first site proposals were submitted to the EC in 2007 and, due to shortcomings for certain types of habitats or species identified by the EC during biogeographical seminars (the last one took place in May 2015 in St. Malo, France, a number of new proposals have been submitted for the extension of the Natura 2000 network in Romania. Much of these sites overlap with the natural protected areas of national interest (national parks, natural parks and nature reserves).

According to the most recent legislative document (MEWF Order no. 46/2016), there are 9 marine Sites of Community Interest (SCIs) along the Romanian Black Sea Coast.

RESULTS AND DISCUSSION

By Minister's of Environment, Waters and Forests Order no. 46 of January 2016, on the establishment of the protected natural habitat regime and the declaration of Sites of Community Importance as an integral part of the European Natura 2000 Ecological Network in Romania, the network of MPAs was amended, by adding new protected sites and extending the area covered by the already existing ones. As such, over a coastline of 245 km (Fig. 1), Romania now has 9 SCIs, as follows (Fig. 2):



Fig. 1. Location of the Romanian Black Sea coastline and share of MPAs.

- ROSCI0311 Viteaz Canyon (newly established)
- ROSCI0413 Southern Lobe of Zernov's *Phyllophora* Field (newly established)
- ROSCI0281 Cape Aurora
- ROSCI0066 Danube Delta marine zone
- ROSCI0094 Mangalia Sulphide Seeps
- ROSCI0197 Eforie North Eforie South Submerged Beach
- ROSCI0269 Vama Veche 2 Mai
- ROSCI0273 Marine Area of Cape Tuzla
- ROSCI0293 Costinești 23 August



Fig. 2. Map of Romanian MPAs.

By extending the ROSCI0066 site - the Danube Delta - Marine Zone towards the offing and the designation of the new ROSCI0413 site - Southern Lobe of Zernov's *Phyllophora* Field, the site ROSCI0237 - Methanogenic carbonate structures from Sfantu Gheorghe was abolished, its territory and its objectives and related conservation measures being taken over entirely by the new sites.

Below are listed all 9 Sites of Community Importance, mentioning their specificities, the Natura 2000 habitat types and species occurring in each site.

1. ROSCI0311 Viteaz Canyon

Date of filling-in the standard Natura 2000 form: December 2015

Date of updating the standard Natura 2000 form: February 2016

Date of proposal as SCI: February 2016

Site location: Longitude 30.0042916 E, Latitude 43.0132972 N Site area (km²): 353.77

Biogeographic region: Black Sea (BLS)

Habitat types occurring in the ROSCI0311 Viteaz Canyon protected site:

- 1170 Reefs
- 1180 Submarine structures made by leaking gases

Species listed in Article 4 of Directive 2009/147/EC and in Annex II of Directive 92/43/EEC in the ROSCI0311 Viteaz Canyon protected site:

• 1349 *Tursiops truncatus* Montagu, 1821

The site has been designated for the conservation of habitats 1180 and 1170 that appear here in a unique and highly representative combination. Worldwide, this habitat is present only in the Black Sea and reaches maximum representativeness in only two locations - one of them is this one, and the other is in the Exclusive Economic Zone of Ukraine (Micu, 2015).

2. ROSCI0413 Southern Lobe of Zernov's Phyllophora Field

Date of filling-in the standard Natura 2000 form: December 2015

Date of updating the standard Natura 2000 form: February 2016

Date of proposal as SCI: February 2016

Site location: Longitude 30.0121666 E, Latitude 44.0088611 N Site area (km²): 1868.15

Biogeographic region: Black Sea (BLS)

Habitat types occurring in the ROSCI0413 Southern Lobe of Zernov's *Phyllophora* Field:

- 1110 Sandbanks which are slightly covered by seawater at all times
- 1180 Submarine structures made by leaking gases

Species listed in Article 4 of Directive 2009/147/EC and in Annex II of Directive 92/43/EEC in the ROSCI0413 Southern Lobe of Zernov's *Phyllophora* Field:

- 1351 *Phocoena phocoena relicta* Abel, 1905
- 1349 Tursiops truncatus ponticus Montagu, 1821
- 4125 Alosa immaculata Bennett, 1835

Zernov's *Phyllophora* field is unique in the world. The part located in Ukrainian waters is already constituted as a protected marine area. This unique and ecologically valuable habitat must also be protected in Romania. This type of habitat

consists of extensive areas covered with perennial red algae, of the genera *Phyllophora* and *Coccotylus*, which develop in circalittoral areas with a hard substrate and an extremely diverse fauna. Zernov's *Phyllophora* field had, in the 1950s and 1960s, a southern lobe that stretched to the Romanian waters (Zernov, 1956), but the intense eutrophication and pollution in the 1970s and 1980s led to its reduction by several orders of magnitude size, surviving only a small islands in the Gulf of Odessa. Since 2004, Ukrainian researchers have found a slow recovery of Zernov's *Phyllophora* field. During the COCOBLAS 2013 survey, carried out in August 2013 with the R/V "Mare Nigrum", it was discovered that, after a 40-year interruption, Zernov's *Phyllophora* field was again expanding into the Romanian Black Sea waters (Micu, 2015).

3. ROSCI0281 Cape Aurora

Date of filling-in the standard Natura 2000 form: October 2010 Date of updating the standard Natura 2000 form: February 2016 Date of proposal as SCI: January 2011 Site location: Longitude 28.0103833 E, Latitude 43.0137444 N Site area (km²): 135.92

Biogeographic region: Black Sea (BLS)

Habitat types occurring in the ROSCI0281 Cape Aurora protected site:

- 1110 Sandbanks which are slightly covered by seawater at all times
- 1170 Reefs
- 1180 Submarine structures made by leaking gases

Species listed in Article 4 of Directive 2009/147/EC and in Annex II of Directive 92/43/EEC in the ROSCI0281 Cape Aurora protected site:

- 1351 *Phocoena phocoena relicta* Abel, 1905
- 1349 Tursiops truncatus ponticus Montagu, 1821
- 4125 Alosa immaculata Bennett, 1835
- 4127 Alosa tanaica Grimm, 1901

The site was designated to respond to the conclusions of the Marine biogeographical seminar in Brindisi (June 2010). Following this, Romania received the INMOD qualification for the habitat 1170 Reefs, with the obligation to designate new sites with depths of 30-40 m for the subtype 1170-2, and for the species 1349 *Tursiops truncatus ponticus* Montagu, 1821 and 1351 *Phocoena phocoena relicta* Abel, 1905, with the obligation to expand the marine sites in the south.

The 1170 habitat has a large extension here, including seven subtypes, according to national classification (Micu et al., 2007; Micu, 2008): 1170-2, 1170-4, 1170-5, 1170-6, 1170-7, 1170-8 and 1170-9. Of these, the greatest importance for preservation is held by habitat 1170-2 *Mytilus galloprovincialis* Lamarck, 1819 biogenic reefs, present in the offshore part of the site, between 30-45 m deep, and 1170-8 Infralittoral rock with photophyllic algae, represented by belts of *Cystoseira barbata* (Stackhouse) C.Agardh. There are also 4 subtypes of habitat 1110 (according to the national classification (Micu et al., 2007; Micu, 2008), with a very good conservation status, two of them: 1110-3 Fine shallow sand, represented in the site by the biocoenosis with *Donax trunculus* Linnaeus, 1758 and 1110-8 Shallow sand

bioturbated by *Arenicola* and *Callianassa*, are very rare in the Romanian Black Sea sector and are of particular interest for conservation.

4. ROSCI0066 Danube Delta - marine zone

Date of filling-in the standard Natura 2000 form: February 2006

Date of updating the standard Natura 2000 form: February 2016

Date of proposal as SCI: June 2007

Date of confirmation as SCI: December 2008

Site location: Longitude 29.0111277 E, Latitude 44.0006472 N

Site area (km²): 3,362.91

Biogeographic region: Black Sea (BLS)

The marine zone of the Danube Delta has certain peculiarities due to the major influence of the Danube inflow and the alluvial inputs deposited by it, that there are unique sedimentary habitats on the Romanian coast. It is worth noting the beauty and richness of the area, with a variety of biotopes and resources that make it unique not only in Europe, but also within the deltaic ecosystems of the world (Zaharia et al., 2012 a and b). ROSCI0066 corresponds to the geographical unit with the same name of the Danube Delta Biosphere Reserve (the Black Sea coastal area, from the Chilia branch to Cape Midia, extending to the depth of 40 m). Being the largest and most comprehensive MPA along the Romanian Black Sea coast, extensive research has been performed here, focusing both on habitats and species.

Habitat types occurring in the ROSCI0066 Danube Delta - marine zone protected site:

- 1110 Sandbanks which are slightly covered by seawater at all times
- 1130 Estuaries
- 1140 Mudflats and sandflats not covered by seawater at low tide
- 1180 Submarine structures made by leaking gases

Species listed in Article 4 of Directive 2009/147/EC and in Annex II of Directive 92/43/EEC in the ROSCI0066 Danube Delta - marine zone protected site:

- 1351 Phocoena phocoena relicta Abel, 1905
- 1349 *Tursiops truncatus ponticus* Montagu, 1821
- 4125 Alosa immaculata Bennett, 1835
- 4127 Alosa tanaica Grimm, 1901

Other significant flora and fauna species of conservative interest encountered here include: *Delphinus delphis ponticus* Barabash-Nikiforov, 1935 (common dolphin), sturgeons listed in Annex V of the Habitats Directive Acipenser gueldenstaedtii Brandt & Ratzeburg, 1833 (Russian sturgeon), Acipenser stellatus Pallas, 1771 (starry sturgeon), Huso huso Linnaeus, 1758 (beluga), Belone belone Linnaeus, 1761 (garfish), Chelidonichthys lucerna Linnaeus, 1758 (tub gurnard), Dasyatis pastinaca Linnaeus, 1758 (common stingray), Raja clavata Linnaeus, 1758 (thornback ray), Liza aurata Risso, 1810 (golden gray mullet), Mullus barbatus ponticus Linnaeus, 1758 (red mullet), Platichthys flesus Linnaeus, 1758 (flounder), Pomatomus saltatrix Linnaeus, 1766 (blue fish), Salmo labrax Pallas, 1814 (Black Sea trout), Anadara inaequivalvis Bruguière, 1789, Cerastoderma edule Linnaeus, 1758, Mya arenaria Linnaeus, 1758, Bryopsis plumose (Hudson) C.Agardh, Callithamnion corymbosum (Smith) Lyngbye, Phyllophora crispa (Hudson) P.S. Dixon, *Phyllophora pseudoceranoïdes* (S.G.Gmelin) Newroth & A.R.A.Taylor, *Porphyra leucosticta* (Thuret) Neefus & J.Brodie.

Applying the methodology for reporting under Article 17 of the Habitats Directive, the conservation status of the two shad species (Alosae) was assessed as being favourable (FV), status which applies for the entire Romanian coastal area (Nicolae et al., 2018). For sturgeon species, however, the assessment showed that there are serious reasons for concern. The conservation status for the species *H. huso* (beluga) and *A. stellatus* (starry sturgeon) resulted Unfavourable-Inadequate U1+, which also applies to the entire Romanian marine zone. The worst conservation status was recorded by far for *A. gueldenstaedtii* (Danube sturgeon), namely Unfavourable-Bad U2+, which is also applicable for the entire Romanian marine zone (Nicolae et al., 2018).

Concerning marine mammals' conservation status in this protected site, the worst situation, Unfavourable-Bad (U2-), was recorded for the Black Sea harbor porpoise - *Phocoena phocoena relicta* Abel, 1905. These small cetaceans undergo the most severe pressures due to its foraging habits, which bring them close to the shore in fishing grounds, where they become by-caught in gillnets. The other two cetacean species in the marine zone of the Danube Delta (ROSCI 0066), the bottlenose dolphin - *Tursiops truncatus ponticus* Montagu, 1821 - and the common dolphin - *Delphinus delphis ponticus* Barabash-Nikiforov, 1935 - were also found in an Unfavourable-Inadequate (U1-) status (Nicolae et al., 2017).

5. ROSCI0094 Mangalia Sulphide Seeps

Date of filling-in the standard Natura 2000 form: June 2006

Date of updating the standard Natura 2000 form: February 2016

Date of proposal as SCI: June 2007

Date of confirmation as SCI: December 2008

Site location: Longitude 28.0028111 E, Latitude 43.0143416 N

Site area (km²): 57.85

Biogeographic region: Black Sea (BLS)

Habitat types occurring in the ROSCI0094 Mangalia Sulphide Seeps protected site :

- 1110 Sandbanks which are slightly covered by seawater at all times
- 1140 Mudflats and sandflats not covered by seawater at low tide
- 1170 Reefs
- 1180 Submarine structures made by leaking gases

Species listed in Article 4 of Directive 2009/147/EC and in Annex II of Directive 92/43/EEC in the ROSCI0094 Mangalia Sulphide Seeps protected site:

- 4125 Alosa immaculata Bennett, 1835
- 4127 Alosa tanaica Grimm, 1901

In spite of its reduced surface, the MPA ROSCI0094 of Mangalia contains the largest diversity of habitats and marine species, and their conservation status is the best in Romania. At present, the ROSCI0094 site of Mangalia is one of the few places in Romania where the *Zostera noltei* Hornemann seagrass survives. The bays on Mangalia Beach contain 78% of the existing *Zostera* habitat in Romania. The sea grass *Zostera noltei* Hornemann develops at small depths, between 0.5 and 2 m, and is currently not affected by tourist activity on Mangalia beach. Also, the site contains the majority (90%) of the population of *Cystoseira barbata* (Stackhouse) C.Agardh perennial algae in Romania. The mid-littoral sand strip at the shore belongs to habitat type 1140 Mudflats and sandflats not covered by seawater at low tide, which also has a very good conservation status here (Micu et al., 2007; Micu, 2008).

6. ROSCI0197 Eforie North - Eforie South Submerged Beach

Date of filling-in the standard Natura 2000 form: June 2006

Date of updating the standard Natura 2000 form: February 2016

Date of proposal as SCI: June 2007

Date of confirmation as SCI: December 2008

Site location: Longitude 28.0030055 E, Latitude 44.0090055 N

Site area (km²): 57.17

Biogeographic region: Black Sea (BLS)

Habitat types occurring in the ROSCI0197 Eforie North - Eforie South Submerged Beach:

- 1110 Sandbanks which are slightly covered by seawater at all times
- 1140 Mudflats and sandflats not covered by seawater at low tide
- 1170 Reefs

Species listed in Article 4 of Directive 2009/147/EC and in Annex II of Directive 92/43/EEC in the ROSCI0197 Eforie North - Eforie South Submerged Beach protected site:

- 1351 Phocoena phocoena relicta Abel, 1905
- 1349 Tursiops truncatus ponticus Montagu, 1821
- 4125 Alosa immaculata Bennett, 1835
- 4127 Alosa tanaica Grimm, 1901

The submerged beach of Eforie is the only beach in the southern part of the Romanian coast that has not been modified so far by the construction of massive coastal protection structures. Only here the natural hydrodynamics and the habitats characteristic of an exposed sandy beach are preserved.

It is the only place on the entire Romanian coast where the *Donacilla cornea* Poli, 1791 and *Donax trunculus* Linnaeus, 1758 bivalve mollusks survive today (Micu & Micu, 2005). In the past (1950-1960), *Donacilla cornea* Poli, 1791 and *Donax trunculus* Linnaeus, 1758 were widespread in all habitats with medium and coarse granular sands in the mid-littoral and infralittoral of the Romanian Black Sea sector. Due to their ecological requirements (water purity, oxygen content, salinity), the mere presence of the two species was an indicator of good quality marine water. Both species, characteristic of typical biocoenoses in the past, had been declared extinct from the Romanian coast in all specialized papers from 1980-2000, the period of maximum eutrophication and ecological decline of the Black Sea (Gomoiu & Skolka, 1998).

7. ROSCI0269 Vama Veche - 2 Mai

Date of filling-in the standard Natura 2000 form: June 2006 Date of updating the standard Natura 2000 form: February 2016 Date of proposal as SCI: June 2007 Date of confirmation as SCI: December 2008 <u>Site location</u>: Longitude 28.0019777 E, Latitude 43.0064000 N <u>Site area (km²)</u>: 123.11

Biogeographic region: Black Sea (BLS)

Habitat types occurring in the ROSCI0269 Vama Veche - 2 Mai protected site:

- 1110 Sandbanks which are slightly covered by seawater at all times
- 1140 Mudflats and sandflats not covered by seawater at low tide
- 1170 Reefs

Species listed in Article 4 of Directive 2009/147/EC and in Annex II of Directive 92/43/EEC in the ROSCI0269 Vama Veche - 2 Mai protected site:

- 1351 *Phocoena phocoena relicta* Abel, 1905
- 1349 *Tursiops truncatus ponticus* Montagu, 1821
- 4125 Alosa immaculata Bennett, 1835
- 4127 Alosa tanaica Grimm, 1901

The Vama Veche - 2 Mai marine protected area is an almost unique combination at the Romanian coast, comprising the largest variety of elementary habitats, the area being considered a true mosaic. Extremely rich benthic and pelagic life forms, referring to the biodiversity in the area, is the reference point for the entire Romanian coast, as well as a refuge and spawning area for many marine organisms (Zaharia et al., 2012 a and b).

The site overlaps the "Vama Veche - 2 Mai Marine Littoral Aquatory" Natural Reserve, established by Decision no. 31/1980 of the Constanta County Council and confirmed as a protected area by Law no. 5/2000 approving the National Spatial Planning Plan with the code 2.345. This MPA is under the custody of NIMRD, which enforces the Management Plan of the marine reserve.

Due to its location (the southern boundary being the border with Bulgaria), as well as the interest shown by the scientific community in the neighboring country, there are perspectives for cross-border expansion (Todorova et al., 2008, Zaharia et al., 2010).

Significant flora and fauna species of conservative interest encountered here include: *Delphinus delphis ponticus* Barabash-Nikiforov, 1935 (common dolphin), *Dicentrarchus labrax* Linnaeus, 1758 (seabass), *Diplodus annularis* Linnaeus, 1758 (annular seabream), *Engraulis encrasicolus* Linnaeus, 1758 (anchovy), *Hippocampus guttulatus* Cuvier, 1829 (long-snouted seahorse), *Psetta maxima* Pallas, 1814 (turbot), *Scorpaena porcus* Linnaeus, 1758 (black scorpionfish), *Sparus auratus* Linnaeus, 1758 (seabream), *Squalus acanthias* Linnaeus, 1758 (spiny dogfish), *Eriphia verrucosa* Forskål, 1775, *Gastrana fragilis* Linnaeus, 1758, *Gibbula divaricate* Linnaeus, 1758, *Mytilus galloprovincialis* Lamarck, 1819, *Palaemon adspersus* Rathke, 1837, *Paphia aurea* Gmelin, 1791, *Petricola lithophaga* Retzius, 1788, *Pholas dactylus* Linnaeus, 1758, *Tricolia pullus* Linnaeus, 1758, *Corallina officinalis* Linnaeus, *Cystoseira barbata* (Stackhouse) C.Agardh.

8. ROSCI0273 Marine Area of Cape Tuzla

Date of filling-in the standard Natura 2000 form: June 2006 Date of updating the standard Natura 2000 form: February 2016 Date of proposal as SCI: June 2007 Date of confirmation as SCI: December 2008

<u>Site location</u>: Longitude 28.0059555 E, Latitude 43.0057916 N <u>Site area (km²)</u>: 49.47

Biogeographic region: Black Sea (BLS)

Habitat types occurring in the ROSCI0273 Marine Area of Cape Tuzla protected site:

- 1110 Sandbanks which are slightly covered by seawater at all times
- 1140 Mudflats and sandflats not covered by seawater at low tide
- 1170 Reefs
- 8330 Submerged or partially submerged sea caves

Species listed in Article 4 of Directive 2009/147/EC and in Annex II of Directive 92/43/EEC in the ROSCI0273 Marine Area of Cape Tuzla protected site:

- 1351 Phocoena phocoena relicta Abel, 1905
- 1349 Tursiops truncatus ponticus Montagu, 1821
- 4125 Alosa immaculata Bennett, 1835
- 4127 Alosa tanaica Grimm, 1901

A high cliff facing the sea, Cape Tuzla continues with a rocky submarine promontory. The marine habitats for which the site was declared are of particular importance: reefs, sand banks permanently covered by seawater, sandflats and mudflats not covered by water at low tide (Zaharia et al., 2012 a and b). In the Cape Tuzla area, the rocky reef bottom has the largest extension to the deepest and most varied and rugged relief of the Romanian Black Sea sector, which is why here is the most diverse range of micro-habitats of this type and, consequently, a very diverse aquatic fauna and flora.

Significant flora and fauna species of conservative interest encountered here include: Acipenser gueldenstaedtii Brandt & Ratzeburg, 1833 (Russian sturgeon), Acipenser stellatus Pallas, 1771 (starry sturgeon), Belone belone Linnaeus, 1761 (garfish), Huso huso Linnaeus, 1758 (beluga), Hippocampus guttulatus Cuvier, 1829 (long-snouted seahorse), Scomber scombrus Linnaeus, 175 (Atlantic mackerel), Uranoscopus scaber Linnaeus, 1758 (Atlantic stargazer), Eriphia verrucosa Forskål, 1775, Halichondria panacea Pallas, 1766, Pachygrapsus marmoratus Fabricius, 1787, Pholas dactylus Linnaeus, 1758, Pilumnus hirtellus Linnaeus, 1761, Tricolia pullus Linnaeus, 1758, Upogebia pusilla Petagna, 1792, Xantho poressa Olivi, 1792, Corallina officinalis Linnaeus, Cystoseira barbata (Stackhouse) C.Agardh.

The area is not yet affected by major anthropogenic impacts and is not conducive to navigation due to the very rugged submarine relief.

9. ROSCI0293 Costinești - 23 August

Date of filling-in the standard Natura 2000 form: August 2010 Date of updating the standard Natura 2000 form: February 2016 Date of proposal as SCI: January 2011 Site location: Longitude 28.0083555 E, Latitude 43.0086166 N Site area (km²): 48.84 Biogeographic region: Black Sea (BLS)

Habitat types occurring in the ROSCI0293 Costinești - 23 August protected site:

- 1110 Sandbanks which are slightly covered by seawater at all times
- 1140 Mudflats and sandflats not covered by seawater at low tide
- 1170 Reefs
- 8330 Submerged or partially submerged sea caves

Species listed in Article 4 of Directive 2009/147/EC and in Annex II of Directive 92/43/EEC in the ROSCI0293 Costinești - 23 August protected site:

- 1351 Phocoena phocoena relicta Abel, 1905
- 1349 Tursiops truncatus ponticus Montagu, 1821
- 4125 Alosa immaculata Bennett, 1835
- 4127 Alosa tanaica Grimm, 1901

The habitats 1110, 1140 and 1170 have a significant presence in the site. The latter has the largest expansion, both in the nearshore and in the offshore zone (30-45 m depth). The site has a very good conservation status, especially for habitat 1170. Habitat 1170 has the largest expansion, but also the largest diversity, including a wide variety of subtypes, according to the national classification (Micu et al., 2008): 1170-2, 1170-4, 1170-5, 1170-6, 1170-7, 1170-8, 1170-9 and 1170-10. Of these, the greatest importance for conservation is held by: 1170-2 *Mytilus galloprovincialis* Lamarck, 1819 biogenic reefs, present in the offshore part of the site, between 30-45 m deep, and 1170-10 Hard infralittoral clay banks with Pholadidae, in which the species *Pholas dactylus* Linnaeus, 1758 (Bern Conv., Barcelona Conv.) lives (Micu, 2008). The subtype 1170-8 Infralittoral rock with with photophylic algae, with great extent and variability of the relief, hosts a very diverse algal flora. The site also hosts six habitat subtypes of habitat 1110 (according to the national classification, Micu et al., 2008), with a very good conservation status.



Fig. 3. Habitat types in Romanian SCIs (from left to right), UP: 1170-2 *Mytilus* galloprovincialis Lamarck, 1819 biogenic reefs, 1170-10 Hard clay banks with Pholadidae (original photo *M.I. Nenciu*) and 1170-8 Infralittoral rock with photophylic algae (original photos), DOWN: 1110 Sandbanks which are slightly covered by seawater at all times, 1140 Mudflats and sandflats not covered by seawater at low tide, 8330 Submerged or partially submerged sea caves (original photos NIMRD).



Fig. 4. Species of conservative interest in Romanian SCIs (from left to right) UP: Hippocampus guttulatus Cuvier, 1829 (long-snouted seahorse) (original photo M.I. Nenciu), Alosa immaculata Bennett, 1835 (Pontic shad), MIDDLE: Donacilla cornea Poli, 1791 (original photo M.I. Nenciu), Pholas dactylus Linnaeus, 1758, Pachygrapsus marmoratus Fabricius, 1787 (original photo M.I. Nenciu), DOWN: Coccotylus truncatus (Pallas) M.J.Wynne & J.N.Heine (original photo: Oana Marin), Corallina officinalis Linnaeus (original photos NIMRD).

The Romanian marine protected area network has been expanded in 2016 by increasing the areas of marine sites of Community importance, as well as by designating two offshore marine protected areas. The share of marine Sites of Community Importance in the Romanian Black Sea sector is shown in Table 1, while the evolution of areas covered in Table 2 (Micu & Spinu, 2017).

Zone	SCI Area (km ²)	SCI Area (%)
Territorial sea (0-12 NM))	3,529.09	84.95
Exclusive Economic Zone (EEZ)	2,528.10	10.38

Table. 1. Share of Sites of Community Importance in Romanian Black Sea waters.

MPA	Area in	Area in	Area in
	2007 (km ²)	2011 (km ²)	2016 (km ²)
ROSCI0066 Danube Delta - MZ	1216.97	1233.74	3362.91
ROSCI0094 Mangalia	3.82	3.82	57.85
ROSCI0197 Eforie	1.4	1.4	57.17
ROSCI0237 Sf. Gheorghe	61.22	61.22	
ROSCI0269 Vama Veche	52.72	71.96	123.11
ROSCI0273 Cape Tuzla	17.38	17.38	49.47
ROSCI0281 Cape Aurora		130.71	135.92
ROSCI0293 Costinești		48.78	48.84
ROSCI0311 Viteaz Canyon			353.77
ROSCI0413 Zernov's Phyllophora			1868.15
Field - SL			
TOTAL	1353.51	1569.01	6057.19

 Table 2. Evolution of the areas covered by Sites of Community Importance at the Romanian Black Sea coast

The Romanian fishing area stretches between Sulina and Vama Veche, over a distance of 243 km and can be divided into two main geographical and geomorphological sectors:

- The northern sector (about 158 km in length) stretches between the secondary delta of the Chilia branch and Constanta, composed mainly of alluvial sediments;

- The southern sector (about 85 km in length) stretches between Constanta and Vama Veche, characterized by high active cliffs, separated by large beaches with sand accumulation areas, often sheltering coastal lakes.

The distance from the shore to the continental shelf (200 m depth) ranges from 100 to 200 km in the northern sector, and 50 km in the southern sector. The submarine slope of the continental shelf is very low in the north, with a depth of 10 m at the Danube mouths, while in the southern sector the depth of 10 m is reached 1.5 km from the shore. The shallow waters below 20 m from the northern part are also included in the Danube Delta Biosphere Reserve, apart from having Natura 2000 status.

The industrial fishing activity in the Romanian marine sector is being practiced in two ways: with passive fixed gear along the coast, in the 12 fishery points, situated between Sulina-Vama Veche, as well as with gillnets and longlines at greater depths, and with active gears (pelagic and beam trawls), by trawler vessels, at depths greater than 20 m (Nicolaev & Zaharia, 2018). Other types of bottom trawling (except for beam trawls) are banned by legislation.

Under Romanian legislation, coastal trawlers, equipped with pelagic (midwater) trawls, activate at depths greater than 20 m.

By introducing the new limits for the protected areas, about 1,500 - 2,000 km² are affected, especially in the northern area of the Romanian seashore, part of the protected area ROSCI0066 Danube Delta - marine zone (Fig. 6).



Fig. 6. Overlapping of pelagic trawling areas and MPAs along the Romanian Black Sea coast (map by Alina Daiana Spînu).

The rapa whelk (*Rapana venosa* Valenciennes, 1846) fishing, which accounts for more than 90% of the catches reported in the past years in the Romanian Black Sea area, is carried out in two ways:

- Manual harvesting, especially in the southern area of the Romanian Black Sea coast, between Constanta - Mangalia, depths 5 - 20 m, on an area of about 200 km²; in the protected areas: ROSCI0197 (Eforie), ROSCI0293 (Costinesti), ROSCI0273 (Cape Tuzla) and ROSCI0281 (Cape Aurora).
- Beam trawl, legalized from July 2013, in the northern area of the Romanian coast, between Mamaia Bay Sf. Gheorghe, at depths of 17 30 m, on an area of about 1,500 2,000 km². Beam trawling takes place exclusively in the area covered by ROSCI0066 Danube Delta marine zone, which represents a traditional fishing ground for Romanian fishermen (Fig. 6).

The beam trawl is a towed fishing gear, which consists of a metal pipe (beam) supported at the extremities on two metal feet, respectively by the mesh part (the collection bag consisting of the lid, the sole and the sides). The beam and the feet are the frame on which the mesh is fastened, which is in turn attached to the front of the sole on a support skeleton (rope, cable or chain), which is intended to drive and guide to the concentration area of the bag the object of fishing (rapa whelk). The mesh is made of 50-55 mm diameter panels, to allow filtering the immature specimens.



Fig. 6. Beam trawl (original photo M.I. Nenciu).

The legalization of beam trawl fishing in July 2013 led to the development of specialized fishing of the species *Rapana venosa* (Valenciennes, 1846), with a substantial increase in landings from one year to another (a maximum of 9.244 tonnes/2017), which resulted in a decrease in pressure on stocks of turbot and sprat, species regulated and monitored closely by the European Commission. The decreasing in pressure on the two stocks was reflected in the assessments made in 2017 (Nicolaev & Zaharia, 2018).



Fig. 7. Hydraulic dredge (original photo A. Filimon)

Recent legislation (Minister's of Agriculture and Rural Development Order no. 1369/2018) legalized the use of another gear, namely the hydraulic dredge, mainly used for the harvesting of the Venus clam (*Chamelea gallina* Linnaeus, 1758). In addition to a classical dredge, it is also fitted with a nozzle system through which pressurized water is pumped. The body of the dredge is made of a rectangular metal frame covered with a metal mesh or bars positioned at 10-12 mm distance. In the rear part, the dredge is equipped with a metal blade, aimed to direct towards the inside the organisms displaced by the water flow (Fig. 7).

However, there are strict provisions regarding the use of these gears, as follows: both for the beam trawl and hydraulic dredge, the selectivity of the gear shall be provided so as not to retain immature individuals; their effects on the marine biotopes and biocoenoses shall be constantly monitored; the use use of the beam trawl in MPAs shall be made pursuant to the provisions of applicable Management Plans and any other regulations; the use of the hydraulic dredge is only allowed outside the boundaries of MPAs.



Fig. 8. Overlapping of beam trawling areas and MPAs along the Romanian Black Sea coast *(map by Alina Daiana Spînu).*

Other human uses that interfere with MPAs' extension are offshore oil and gas exploration and exploitation activities, such as pipelines, offshore platforms in operation in protected areas (Fig. 9).



Fig. 9. Integrated map: overlapping of offshore oil & gas areas, pelagic and bottom trawling areas and MPAs along the Romanian Black Sea coast *(map by Alina Daiana Spînu)*.

CONCLUSIONS

The extension of the existing and the creation of new Natura 2000 sites in the Romanian Exclusive Economic Zone (EEZ) at the Black Sea was made by overlapping, by 20 m depth, with pre-existing traditional economic activities, mainly fishing, but also offshore oil and gas exploitation.

Naturally, this overlapping of MPAs on existing activities has generated limitations and constraints of economic activities, which resulted in conflicts of interests between fishermen communities and environmental protection authorities.

The resource-use restrictions that an MPA implies are likely to affect different groups of people and stakeholders. When planning an MPA, it is important to ensure that it will not deprive particular groups (fishermen, in this case) of their livelihoods without providing alternatives. The designation of MPAs should to be based on a combination of bio-ecological and socioeconomic criteria, ensuring long-term sustainability, but also considering and mitigating short-term costs (Zaharia et al., 2014).

In order to minimize these conflicts, the assessment of the interaction between fisheries and the preservation objectives of the Natura 2000 sites is compulsory and highly important. A feasible solution in this sense would be modifying the shape of the designated protected area, while maintaining the same surface (thus complying with the European requirements in this respect), in order to allow the deployment of fishing operations on traditional fishing grounds.

Under such circumstances, the amiable settlement of economic and conservation interests should be made using compromise solutions: one of these

solutions could be the differentiated zoning of Natura 2000 sites.

Some of these areas would allow certain activities, while others would limit/ban them temporarily or permanently. Identifying the selection criteria should be based on preliminary scientific and risk assessments of zoning, considering the existing Management Plans of the MPAs. Moreover, all fisheries related provisions should always be correlated with the stipulations in the Management Plans of the respective MPA (where the case).

Some concrete examples in this sense were identified at the Romanian Black Sea coast. For instance, in the Vama Veche - 2 Mai Marine Reserve (which has a double status, of Natura 2000 SCI and natural reserve under the national legislation), traditional fishing activities (usining gillnets, pound nets) are allowed in the buffer/sustainable management zone, provided fishermen apply for and obtain a permits from the MPAs custodian. Moreover, the Management Plan of the Danube Delta Biosphere Reserve (currently under revision) will also include provisions regarding fisheries management inside the protected area.

Another feasible solution aiming at reconciling the arising conflicts would be modifying the shape of the designated protected areas, while maintaining the same surface (thus complying with the European requirements in this respect), in order to allow the deployment of fishing operations on traditional fishing grounds.

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