

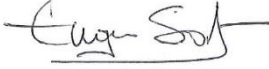



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Fishery Pre-Seismic Monitoring in Blocks 4, 5, 9 and 10

Non-technical summary

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NON-TECHNICAL SUMMARY

The State of Montenegro signed a Concession Contract for the Production of Hydrocarbons (PCC) with Eni Montenegro B.V. and Novatek Montenegro B.V. (hereinafter the “*Concessionaire*”) referred to the area defined by the offshore Blocks 4, 5, 9, and 10 (the PCC area) on September 2016.

An Environmental Impact Assessment (EIA) Study for the 3D geophysical survey in the PCC area was drafted and submitted 14/09/2017 and subsequently approved by the Agency for Protection of Nature and Environment of Montenegro (MEPA) on 23/07/2018. One of the obligation foreseen by the EIA Study was the execution of a fishery monitoring before the commencement of 3D geophysical survey (whose acquisition started on November 18th 2019) and one year later, on the same period.

Golder Associates S.r.l. (“Golder”), in partnership with Institute of Marine Biology of Kotor (IBM), was appointed by the Concessionaire to carry out the monitoring activities. The present document constitutes the **Non-Technical Summary of the Fishery Pre-Seismic Monitoring Report**. The Post-Seismic Monitoring will be carried out one year after the Pre-Seismic Monitoring (i.e. August-September 2019), in compliance with the Authority’s requests.

The aim of the survey was to record data on fish and invertebrates’ community composition in the Study Area (i.e., the area defined by offshore Blocks 4, 5, 9, and 10 – Figure 1) through surveys on daily catches performed in the main Montenegrin fishing ports before the start of the seismic activities.

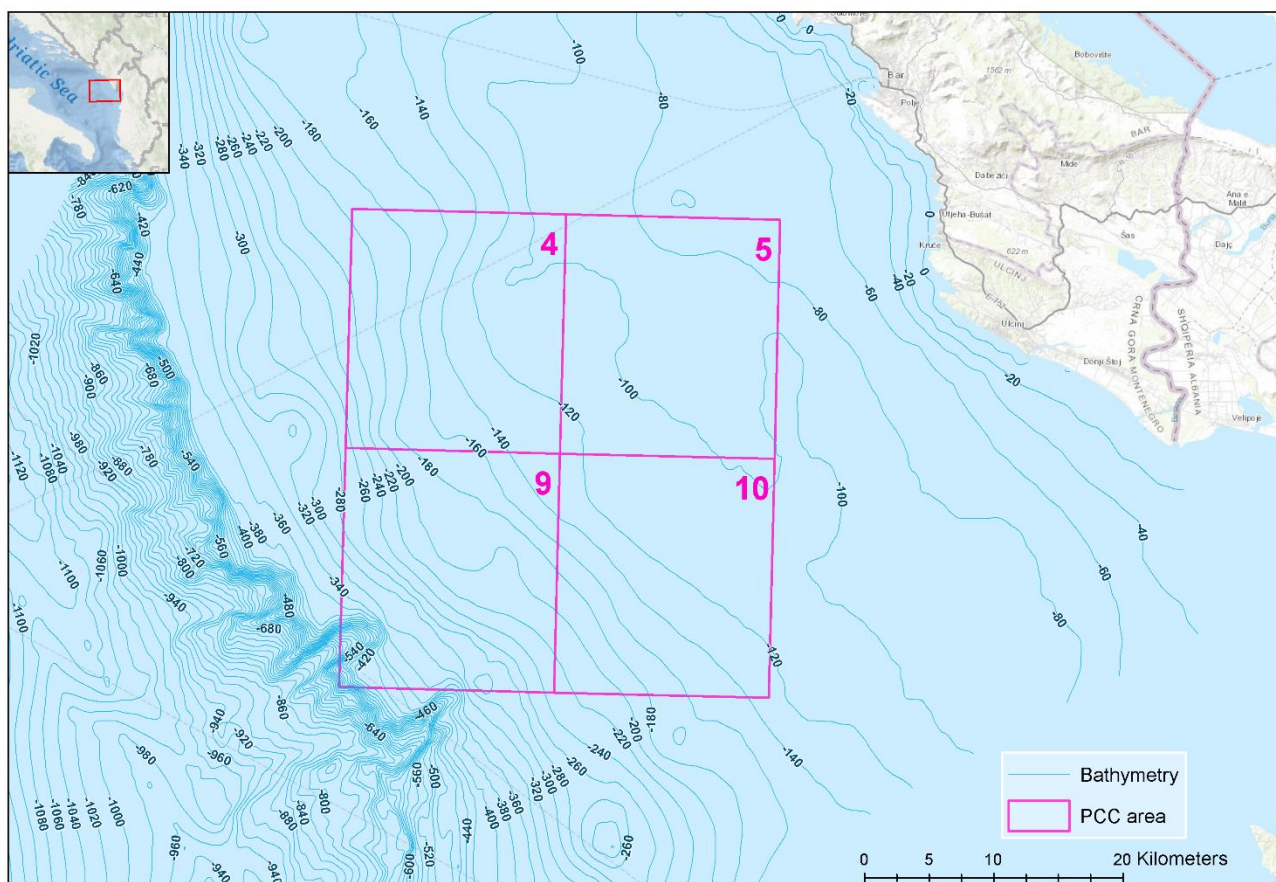


Figure 1: The PCC area

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The Pre-Seismic Survey of fish and invertebrates has been carried out from August to September 2018. **The methods of the survey** encompassed the collection of data from the fishing vessels that perform their fishing activities inside and in the surroundings of the Study Area. Surveys were performed once a week, totalling 20 landings and covering the ports of Bar, Budva and Ulcinj. During the surveys, 14 vessels were assessed. The surveys included samplings from: bottom trawl vessels, purse seines, set nets (gillnets and trammel nets) and longlines. For each survey, vessel data (e.g., name, power, length, gross tonnage) and information on the catch and gears (e.g., fishery duration, location, depth, size of the net) were recorded.

All landed species have been classified to the lowest taxonomic level possible (i.e., species). Their abundances were recorded and their total weights measured by landing/economic category. Data were recorded both for landed and the discard composition. Data on landed fish were obtained *in situ*, while discards were transported to the Institute of Marine Biology of Kotor (IBM) for the data recording.

The results of the survey show a total of 99 species of fish and invertebrates recorded from a total of 20 catches. Most species were fish (73 species), followed by cephalopods and crustaceans (7 species each), echinoderms (6 species), cnidarians (4 species) and molluscs (2 species). Ten fish species result on the IUCN Red List: 3 Near Threatened, 5 Vulnerable and 2 Endangered species.

On 20 landings, a total of 3,170 kg of fish and other marine organisms were caught: the majority came from bottom trawlers, followed by purse seines, longlines and set nets. Average value of Catch Per Unit Effort (CPUE)¹ was calculated for each assessed fishing tool, as reported below:


- Bottom trawl nets: 15.66 kg/h;
- Set nets: 6.69 kg/100 m of net;
- Purse seine: 107.93 kg/h of light
- Longlines: 47.73 kg/100 hooks.

Out of the total of fish and other marine organisms caught, 88% were landed and 12% were discarded. Landed and discarded catches were separately analysed, because of the different used data collection methods.

■ Landed Catches

- In bottom trawl landings, the dominant species in terms of number was the deep-water pink shrimp, followed by the red mullet and the European hake. The dominant species in terms of weight was the European hake, followed by the red mullet and the deep-water pink shrimp. These three species are considered the most important target species in Montenegrin fisheries.
- In the purse seine landings, the most dominant species by number was the Atlantic horse mackerel and the dominant species by weight was the Atlantic mackerel. European pilchard and European anchovy, typically the most common and abundant catches in purse seine fisheries in the Adriatic, during the monitoring period were scarce (the former) or absent (the latter).
- Two species dominated set nets landings: the seabass, and the golden grey mullet. The common smooth-hound result important by weight. Presence of the white grouper, a fairly rare species, should be noted.

¹ Catch per unit effort (CPUE) is an overall average deriving from sampling and expressing how much fish (all species) is caught by a unit effort. It is expressed as the catch taken for a given amount of fishing effort over time using a specific gear.

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- Two species dominated longline landings: the red porgy by number and the bluefin tuna by weight. Other species with significant presence were: the common dentex, the pink dentex, the common dolphinfish, and the swordfish.
- Three of the landing species are commercially split into different categories according to the specimen's dimension. For the European hake, one of the most important species in Montenegrin fisheries, the dominant category, both by number and by weight, was the Small category. Regarding the red mullet, the most dominant category in terms of number was Small, whereas Small and Medium categories were about equally represented in terms of weight. Most of the black-bellied angler landings were Medium.

■ Discarded Catches

- Only two of the fishing gears sampled had discards: bottom trawls and set nets. Almost all the discards came from bottom trawls. Indeed, bottom trawls, due to their non-selectivity and the mode of operation, usually have one of the highest amounts of discard among the fishing gears.
- In bottom trawl discards, the deep-water pink shrimp was the most represented species by number, while the small-spotted catshark was the most represented by weight. Economically important species, such as pickarel, small-spotted catshark, spottail mantis shrimp, present in discard are usually either the specimens too small or damaged to be of interest to the market.
- The dominant species in set net discards was the purple sea urchin, both by number and by weight. Other species present in discard were either the specimens too small or too damaged.

In conclusion, according to results of the Pre-Seismic survey, a high number of species was found in the Study Area. The sizes of the target species show a possible overfishing status for these species. Qualitative and quantitative data relating to the catches in the PCC area are now available.

The same survey protocol and methods will be used in the Post-Seismic monitoring in August-September 2019 in order to compare data before and after the seismic survey. The comparison will be based mainly on the following parameters: qualitative comparison between the total list of species, composition of catches for each fishing gear by number of individuals, weight, and percentage of number and weight, CPUE for each fishing gear and sizes of the main target species.