Interreg Mediterranean MPA NETWORKS

Project co-financed by the European Regional Development Fund

Final SSF Catch Monitoring Report

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MPA NETWORKS project

Support MPA effectiveness
through strong and connected networks in the Mediterranean

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Priority Axis 3: Natural and cultural resources - Objective 3.2: Biodiversity protection

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Final SSF Catch Monitoring Report


DKNY

The catch composition of the fisheries landings in the Fishing Center Oriku (in Orikum) is reported for 6 months, which are represented by the time period, from September 2020 to February 2021.

As it is shown in Figure 1A, during the monitoring performed in September, from the total landed catch coming from the small scale fishing activities inside the MPA (Karaburun and Sazani Island areas), the most representative species (in terms of abundance) are represented by striped red mullet (*Mullus surmuletus*) with 31% of total catch, European hake (*Merluccius merluccius*) with 23% and *Sphyraena* sp. with 9% of the total fished biomass.

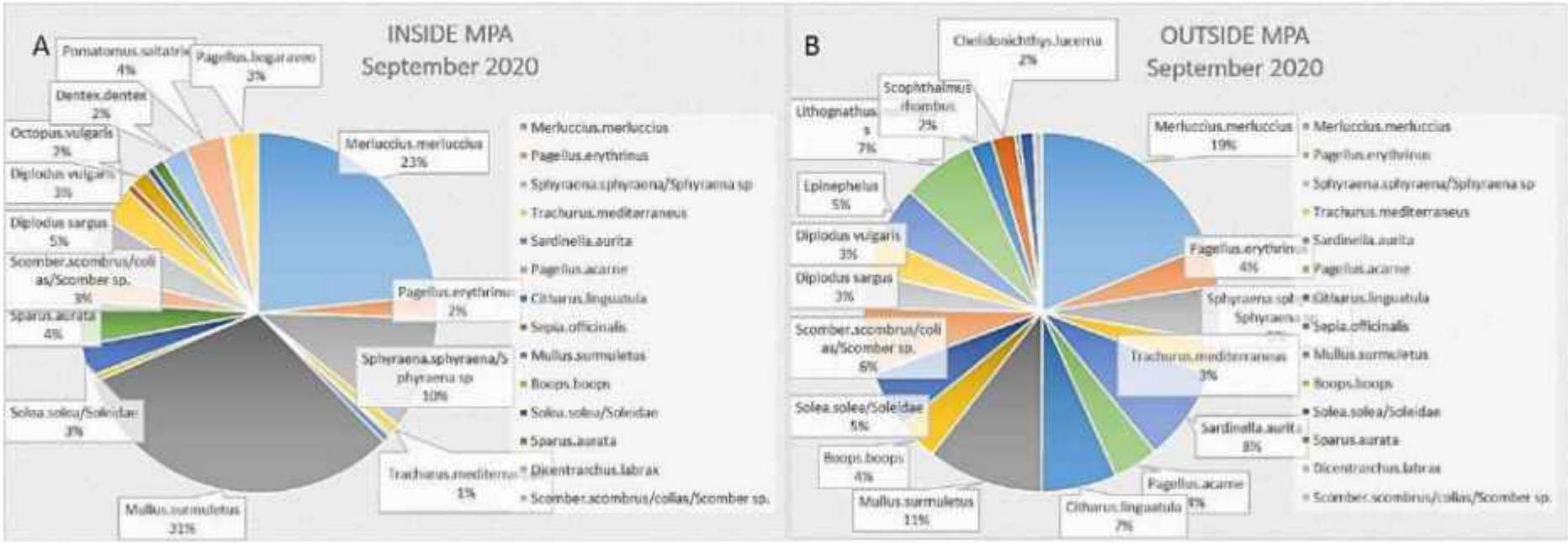

Figure 1. Catch composition of the fisheries landings from the small-scale vessels, which have been operating inside (A) and outside (B) the MPA during the month of September.

The same species never resulted to be the most abundant on the analyses of data corresponding to the catch composition coming from fishing outside the MPA (Figure 1B) (European hake 19%; striped red mullet 11%; round sardinella (*Sardinella aurita*) 8%), though other species were included in the list of the considerable fished species during September month, which are represented by spotted flounder (*Chitarus linguatula*), sand steenbras (*Lithognathus mormyrus*) and *Scomber* sp.

During the monitoring of the fisheries landing composition in October (Figure 2 A), the most representative species of the fishing activities inside the MPA resulted to be represented by gilthead seabream (*Sparus aurata* 27%), common two-banded sea bream (*Diplodus vulgaris* 19%) and European hake (11%).

The fisheries catch composition corresponding to the area outside the MPA (Figure 2 B) was mostly characterized by European hake (30%), common pandora (*Pagellus erythrinus* 13%), striped red mullet (12%) and *Sphyraena* sp. (11%), while the common two-banded sea bream constituted just 10% of the total fished biomass.

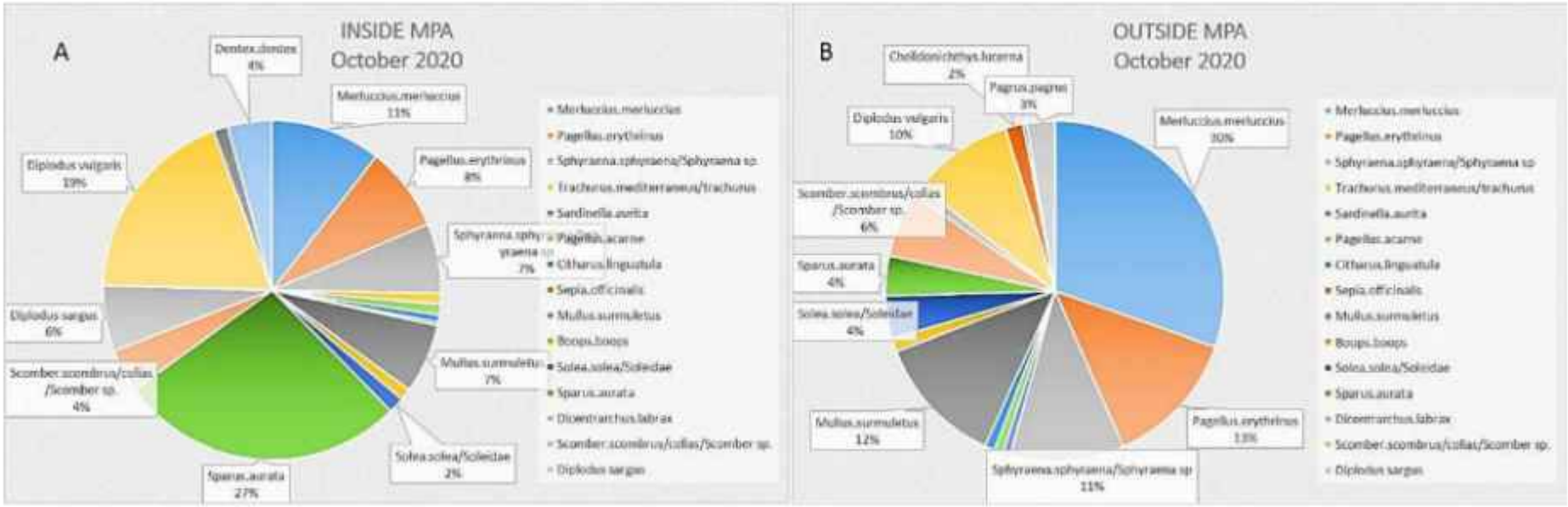

Figure 2. Catch composition of the fisheries landings from the small-scale vessels, which have been operating inside (A) and outside (B) the MPA during the month of October.

Gilthead seabream resulted to be the most abundant on the analyses of data corresponding to the catch composition coming from fishing inside the MPA during the month of November (Figure 3A) (gilthead seabream 30%; European hake 11%; *Sphyraena sp* 9% and Soleidae members, like common sole (*Solea solea*) 8%), though other species were included in the list of the considerable fished species during November month, which are represented by *Mullus* sp (*Mullus surmuletus* and *Mullus barbatus*), common two-banded sea bream (*Diplodus vulgaris*), brown meagre (*Sciaena umbra*), white seabream (*Diplodus sargus*) and *Scomber* sp. Regarding the fishing areas outside the MPA, the most abundant species were European hake (33%), gilthead seabream (24%) and Sphyraena sp. (10%), while other species with a catch abundance equal or higher than 5% are represented by white seabream, *Mullus* sp. and bogue (*Boops boops*).

During the monitoring of the fisheries landing composition in December (Figure 4 A), the most representative species of the fishing activities inside the MPA resulted to be represented by gilthead seabream (*Sparus aurata* 52%) and European hake (19%). The fisheries catch composition corresponding to the area outside the MPA (Figure 4 B) was mostly characterized by Atlantic bonito (*Sarda sarda* 21%), gilthead seabream (17%), Soleidae members (14%), European hake (13%) and *Sphyraena* sp. (11%).

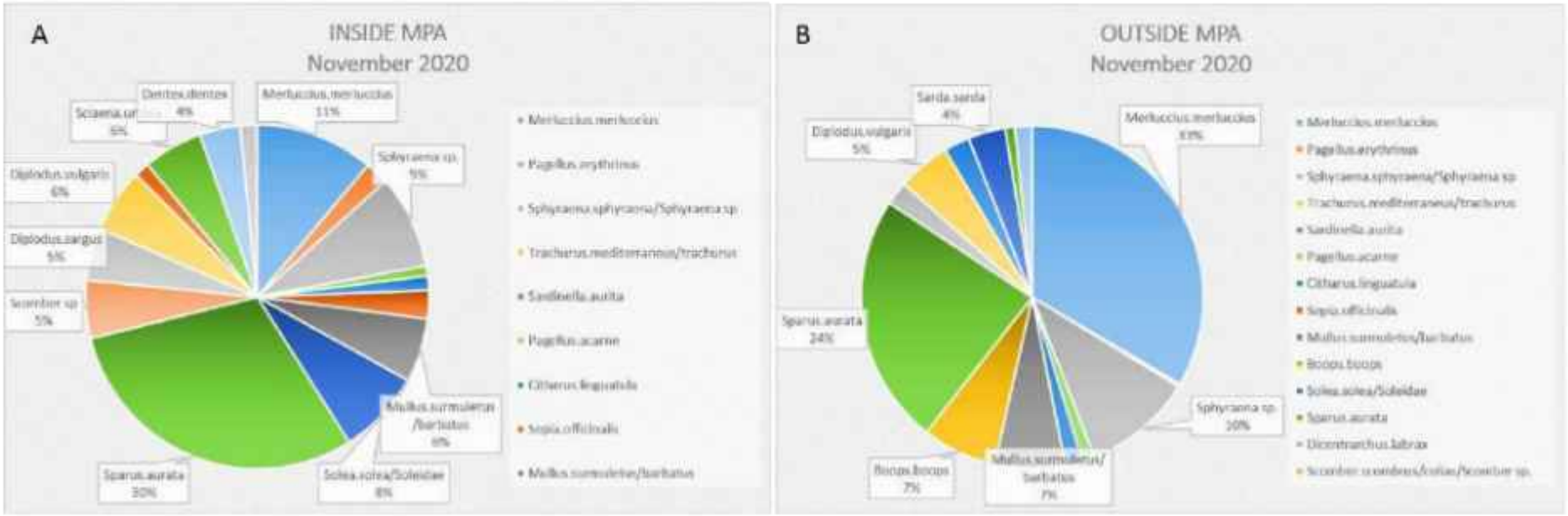

Figure 3. Catch composition of the fisheries landings from the small-scale vessels, which have been operating inside (A) and outside (B) the MPA during the month of November.

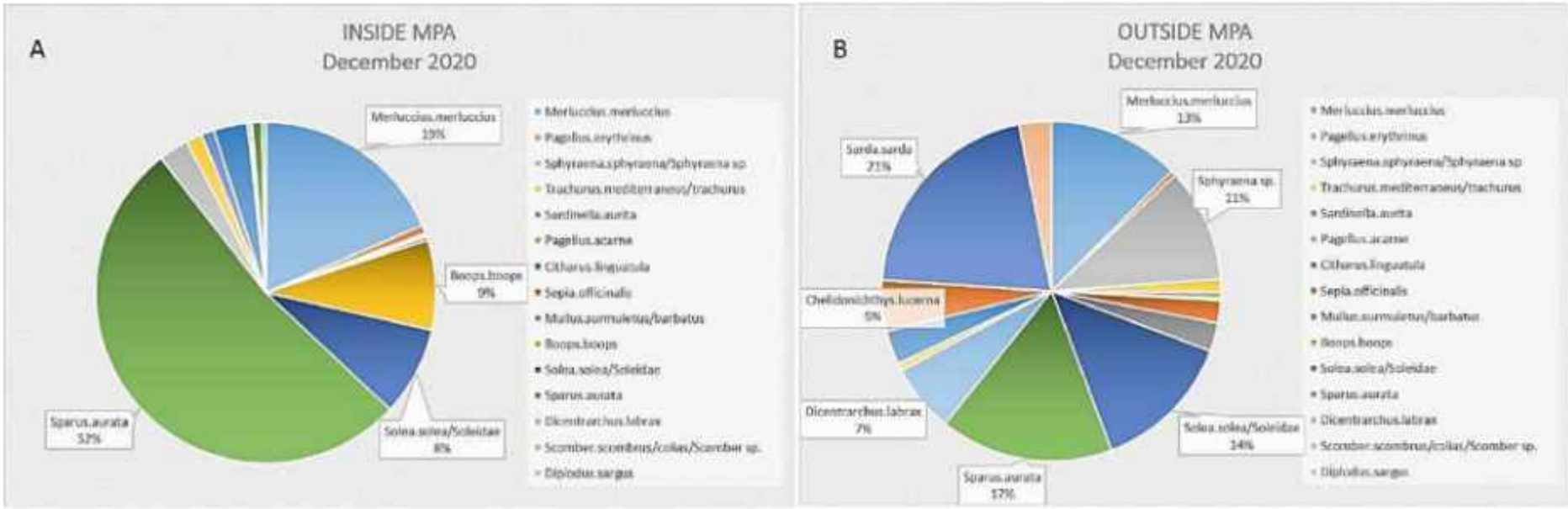

Figure 4. Catch composition of the fisheries landings from the small-scale vessels, which have been operating inside (A) and outside (B) the MPA during the month of December.

During the remaining months (January and February, please see Figures 5 and 6, respectively) of the monitoring time period, almost the same mentioned species resulted to be the most abundant. In January, from the analyses of data corresponding to the catch composition from fishing activities inside the MPA (Figure 5A), Soleidae family members (mostly represented by common sole) were the most abundant (32%), followed by Atlantic bonito (25%) and gilthead seabream (14%). Outside the MPA (Figure 5B) the common sole didn't result to be the most abundant species and it was substituted by European hake (34%), though it was included in the list of the most abundant species, together with *Trachurus* sp., Atlantic bonito, gilthead seabream and bogue. It is interesting to note that during the monitoring of fisheries landing composition in February (Figures 6A and B) the most representative (abundant) species of the fishing activities inside and outside the MPA resulted to be represented by European hake (57% inside and 42% outside the MPA). The other species included in the list of the most abundant species during the fishing inside the MPA (Figure 6A) are represented by gilthead seabream (11%), Atlantic bonito (10%), common sole (6%), *Mullus* sp., *Scomber* sp. and white seabream, while outside the MPA the other abundant species are represented by Atlantic bonito (15%), gilthead seabream (8%) and Sphyraena sp. (8%).

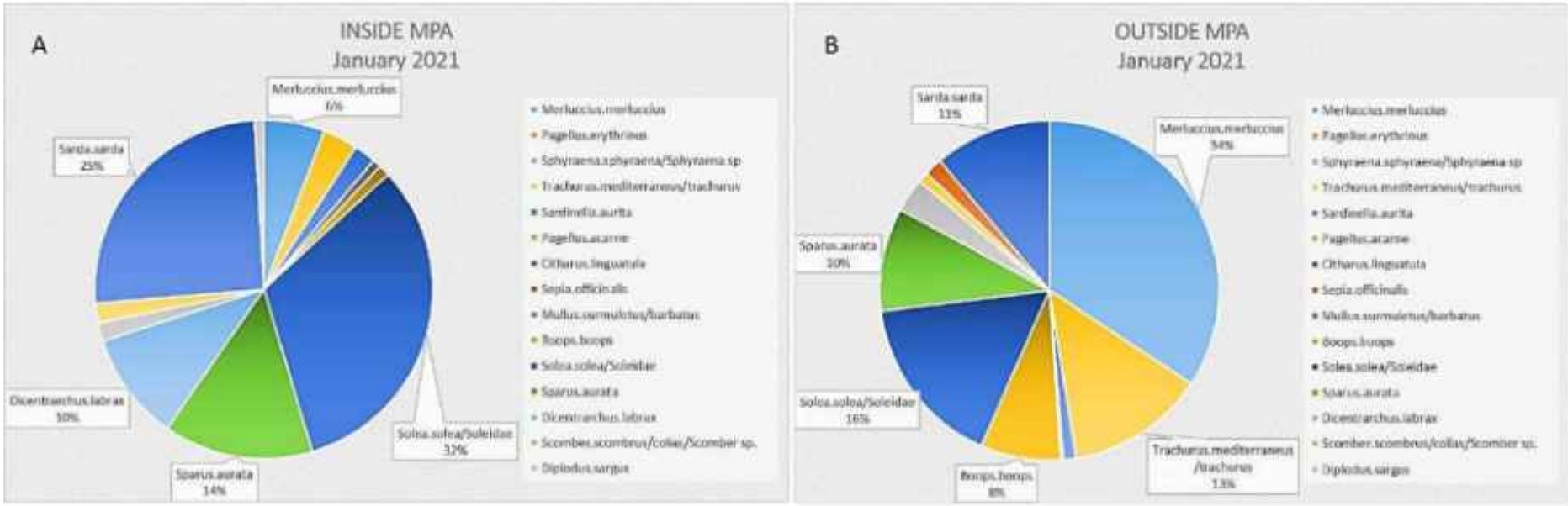

Figure 5. Catch composition of the fisheries landings from the small-scale vessels, which have been operating inside (A) and outside (B) the MPA during the month of January.

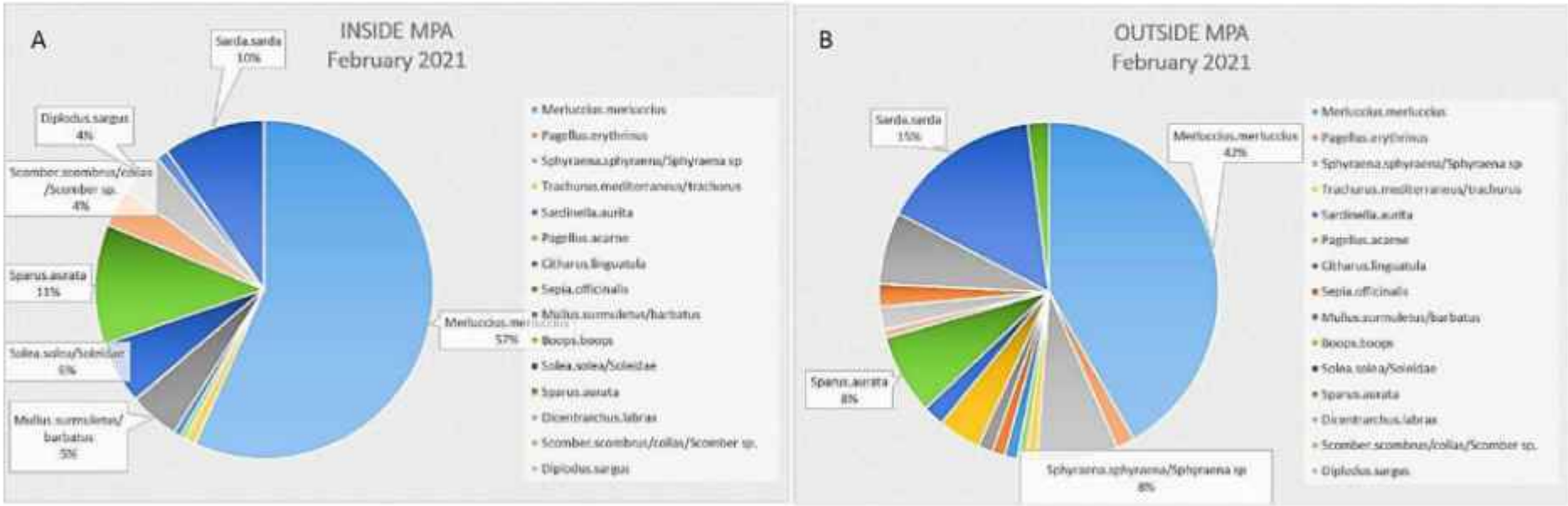

Figure 6. Catch composition of the fisheries landings from the small-scale vessels, which have been operating inside (A) and outside (B) the MPA during the month of February.

In Figure 7 is shown the total landed catch inside and outside the MPA for each of the most fished species during the integrated fisheries monitoring (from September 2020 to February 2021). The fished biomass of *Mullus sp.*, *Soleidae* member, *S. aurata*, *D. labrax*, *Scomber sp.*, *D. sargus*, *D. vulgaris*, *O. vulgaris*, *S. umbra*, *D. dentex*, *P. saltatrix* and *P. bogaraveo* was higher inside the MPA than outside it, while the fished biomass of *M. merluccius and S. officinalis* was nearly identical inside and outside the MPA. In the case of *P. erythrinus*, *Sphyraena sp.*, *Trachurus* sp., *S. aurita*, *P. acarne*, *Chitarus linguatula*, *Boops boops*, *Epinephelus sp.*, *Lithognathus mormyrus*, *Schophthalmus sp.*, *C. lucerna*, *Spicara sp.*, *Sarda sarda* and *Pagrus pagrus*, the fished biomass resulted to be higher outside the MPA than inside it.

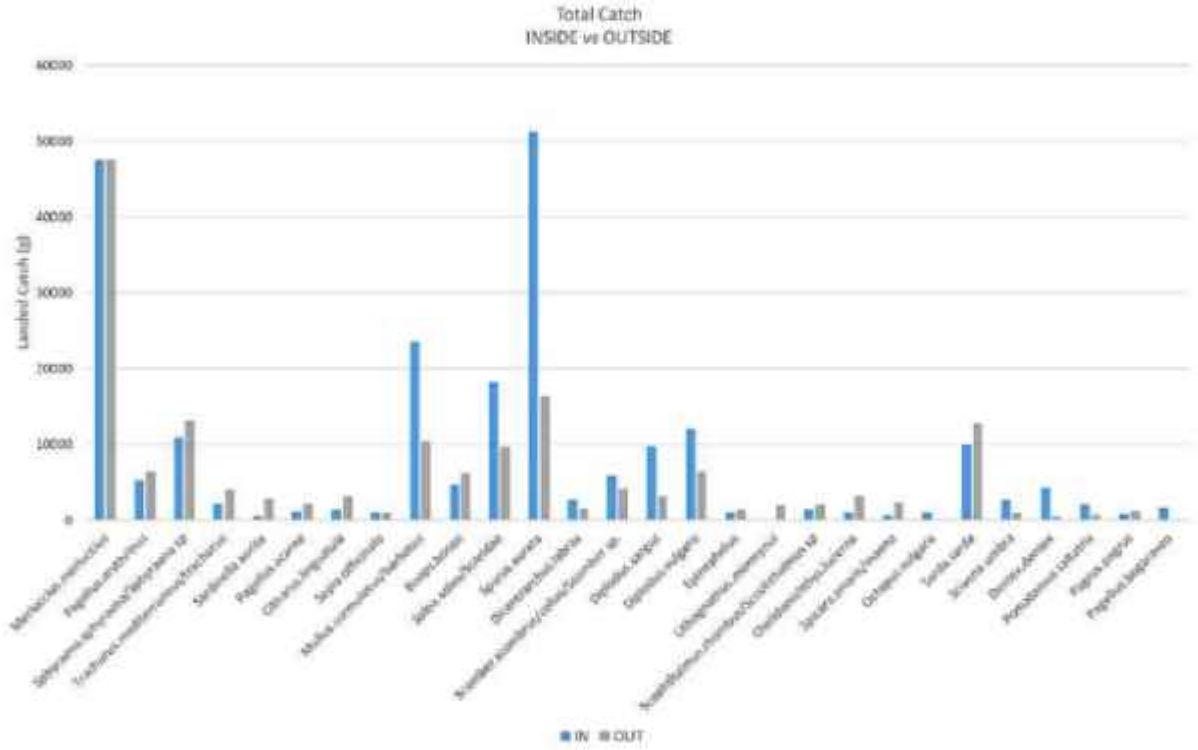

Figure 7. The total catch registered for each of the most representative species along the monitoring of fisheries landings during the 6 months, from September 2020 to February 2021.

In Figure 8 are graphically shown the monthly average landed catches inside and outside the MPA during all the 6 months of landed catches monitoring. The variance

is generally high as shown by the barrel corresponding to the standard deviation. Furthermore, the application of the t-test ($p<0.05$) showed that no statistically significant difference exists between the monthly average catch inside and outside the MPA for each of the most fished species.

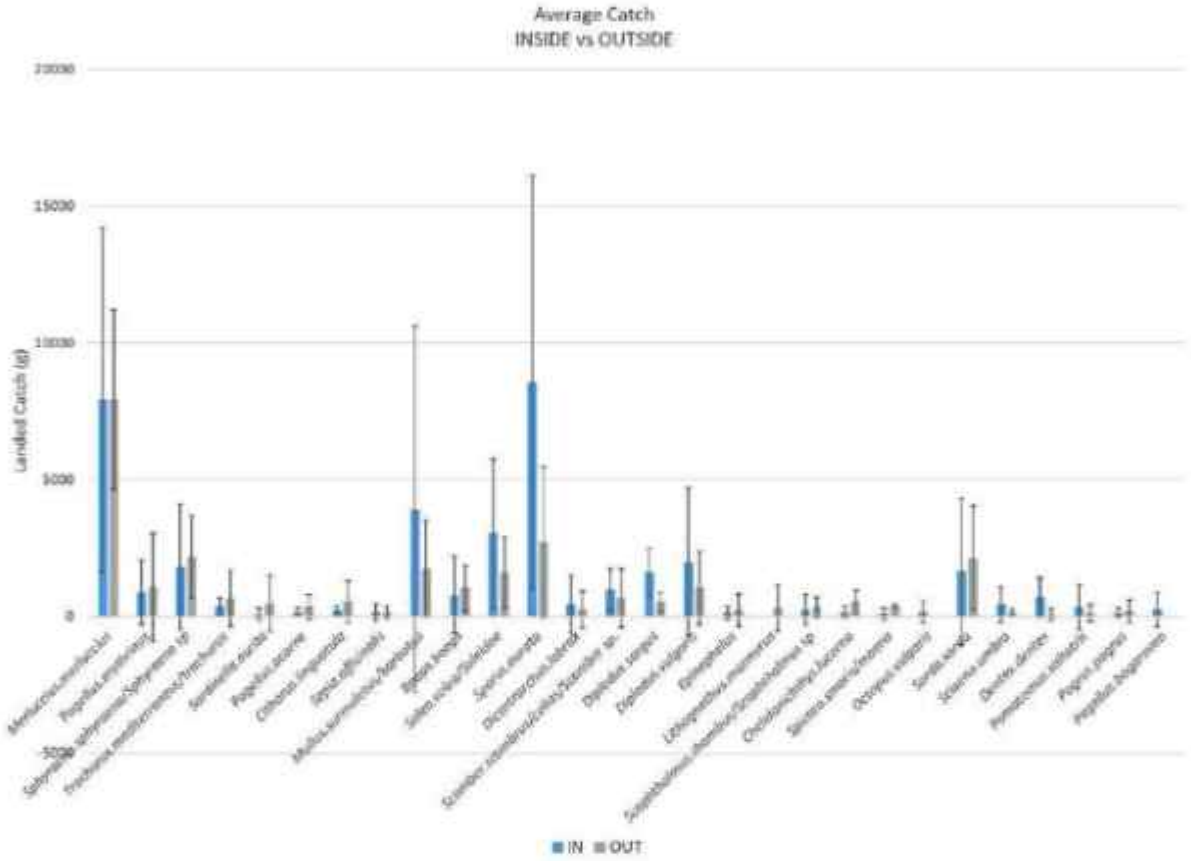

Figure 8. The average catch registered for each of the most representative species along the monitoring of fisheries landings (barrels represent the standard deviation values) during the 6 months, from September 2020 to February 2021.

For the three most fished species (European hake, striped red mullet and gilthead seabream) and the most frequently encountered species (bogue), inside and outside the MPA of Karaburun-Sazani are shown the monthly total landed catch during the 6 months (Figure 9, 10, 11 and 12, respectively).

In the case of European hake (*M. merluccius*) (Figure 9), the landed catch coming from the small-scale vessels (which were fishing) in the area outside the MPA was higher than the fished biomass corresponding to the small-scale fishing activities inside the MPA during the months of October, November and January, while during September, December and February months, the landed catch coming from the fishing activities inside the MPA was higher than those corresponding to the ones outside the MPA.

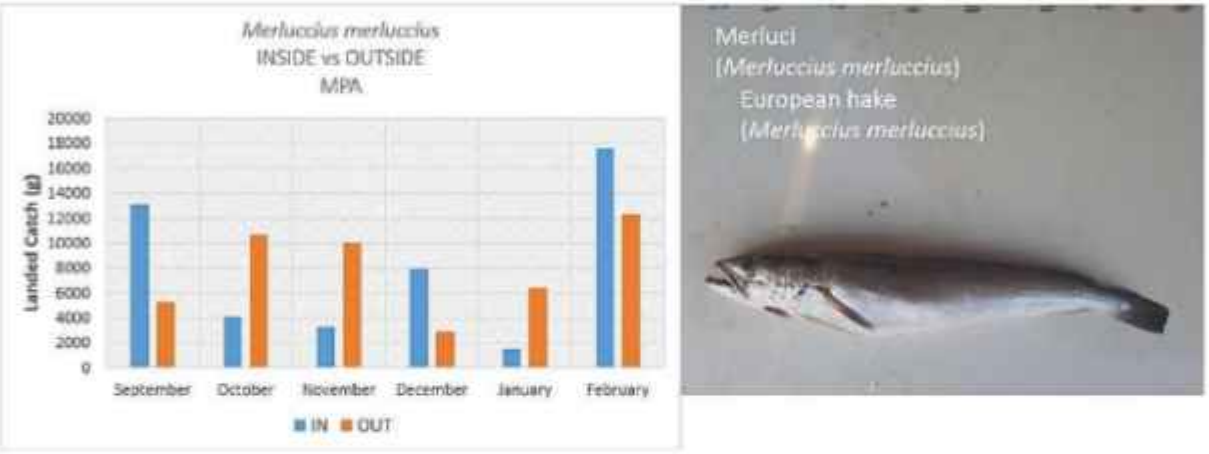

Figure 9. The monthly total catch registered for European hake (*M. merluccius*) inside and outside the MPA (fishing areas close to Karaburun peninsula and Sazani island).

Regarding the stripped red mullet (*M. surmuletus*) (Figure 10), the landed catch coming from the small-scale vessels in the area outside the MPA was higher than the fished biomass corresponding to the small-scale fishing activities inside the MPA during October, November and December, while during September, January (no individuals outside the MPA) and February, it happened the contrary with the registered landed biomass by the SSF.

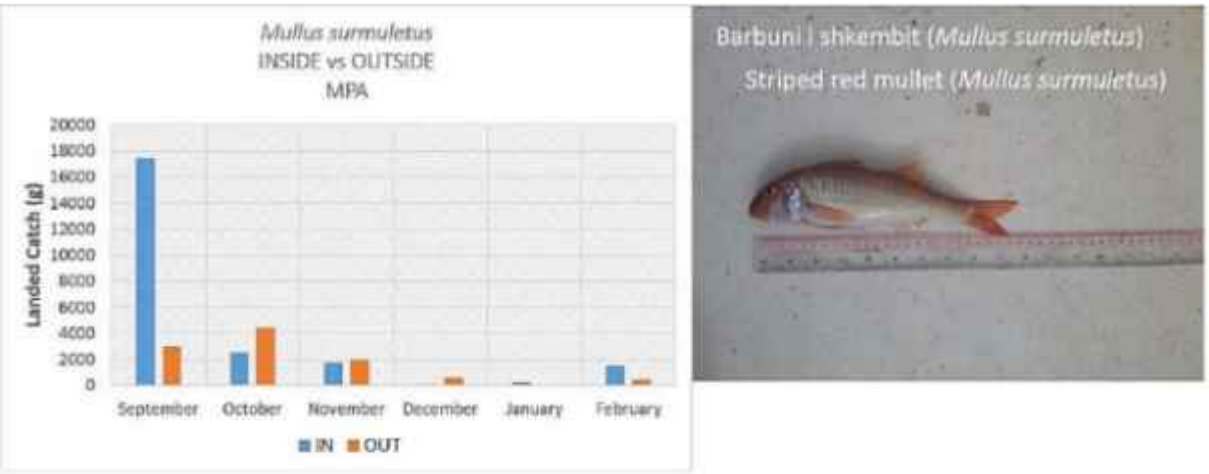

Figure 10. The monthly total catch registered for striped red mullet (*M. surmuletus*) inside and outside the MPA (fishing areas close to Karaburun peninsula and Sazani island).

Regarding the gilthead seabream (*S. aurata*) (Figure 11), the landed catch coming from the small-scale vessels in the area inside the MPA was higher than the fished biomass corresponding to the small-scale fishing activities outside the MPA during October, November, December, January and February, while during September no presence of gilthead seabream individuals was observed during the monitoring of the landed catches coming from the fishing areas outside the MPA.

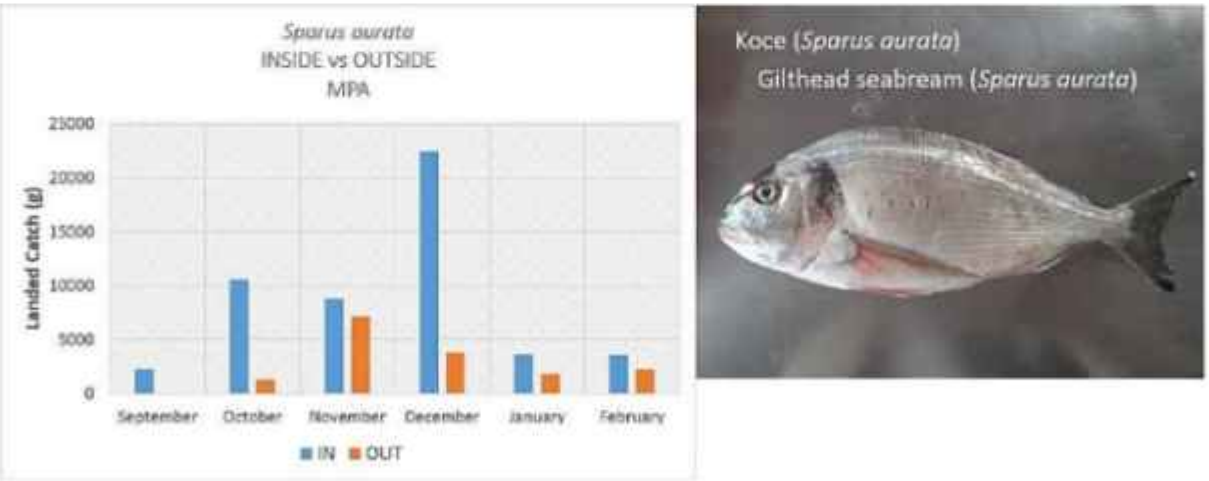

Figure 11. The monthly total catch registered for gilthead seabream (*S. aurata*) inside and outside the MPA (fishing areas close to Karaburun peninsula and Sazani island).

In the case of the bogue (*B. boops*) in October no differences were observed between the two fishing areas, while in September the fished biomass resulted to be higher outside than inside the MPA (Figure 12). In addition, in November all the fisheries catches correspond to the fishing activities outside the MPA, while in December all the relative catches correspond to the fishing activities inside the MPA. Similarly to September, the fished biomass resulted to higher outside than inside the MPA, in January and February.

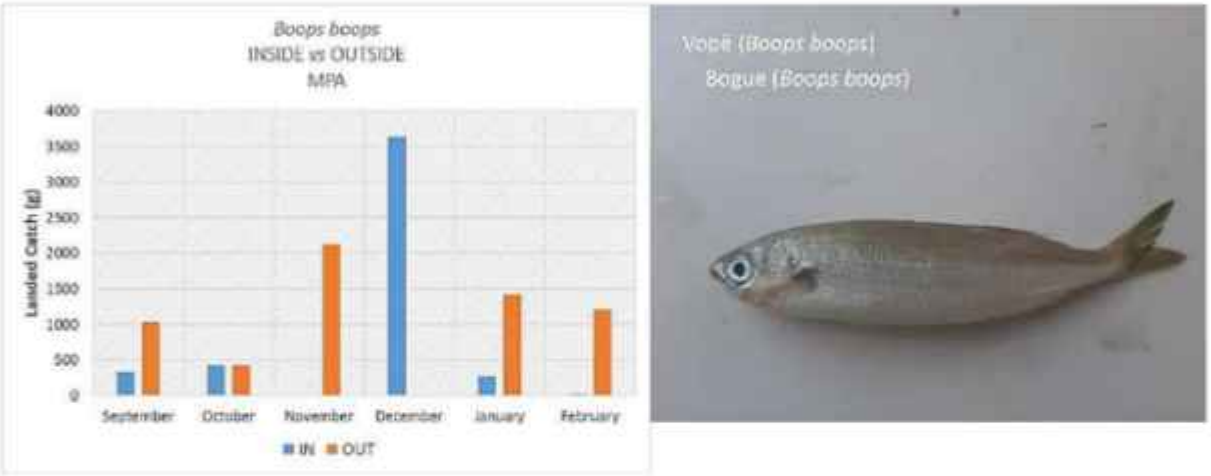

Figure 12. The monthly total catch registered for bogue (*B. boops*) inside and outside the MPA (fishing areas close to Karaburun peninsula and Sazani island).

Furthermore, it was calculated the Catch per Unit of Effort (CPUE) based on the landed catch corresponding to the small-scale fishing activities inside and outside the MPA. The CPUE is expresses as kg of fish per 1000 m of deployed fixed net (trammel net).

In Figures 13, 14, 15, 16, 17, 18 are shown the graphics corresponding to the average CPUEs inside and outside MPA (Figures 13A, 14A, 15A, 16A, 17A and 18A for September, October, November, December, January and February, respectively; inside and outside Karaburuni area) area, while the average CPUEs inside and outside Sazani Island area are shown in Figures 13B, 14B, 15B, 16B, 17B and 18B, respectively.

From the t-test ($p<0.05$), it resulted that no statistically significant differences exist between fishing inside Karaburuni area (Figure 13A and Figure 14A) and outside it, for the months of September and October, or fishing inside the area around the Sazani island (Figure 13B and Figure 14B) and outside it, though there are some slight differences, as shown in the respective graphics (particularly in the case of Figure 14B, which correspond to the October landed catch data).

Furthermore, as it is shown in the graphic of Figures 13, the fishing area corresponding to the Sustainable Development Zone (in the Zoning System of Karaburun-Sazani MPA) resulted to be less productive than the area around Sazani island (Core Zone and Effective Management Zone). In addition, the fishing areas located close to the Core Zone and the Effective Management Zone of Sazani Island (in the Zoning System of Karaburun-Sazani MPA), based on the average CPUE values comparisons, these areas resulted to be more productive than the fishing areas close to the Sustainable Development Zone of Karaburun peninsula.

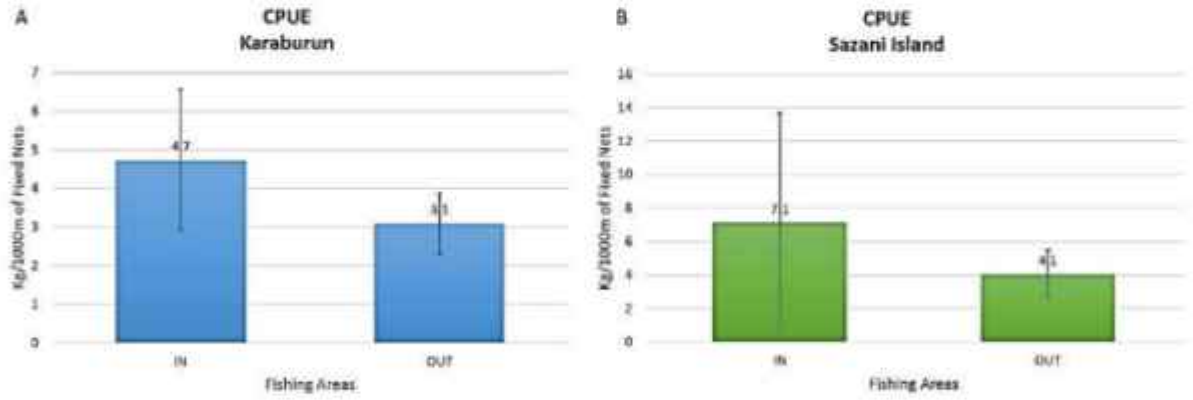

Figure 13. The comparisons of the average CPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), CPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of September; the CPUE is expressed as kg of fish per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

Regarding the month of October (Figure 14), the most productive fishing areas were included inside the Sustainable Development Zone of Karaburun peninsula, though

the fishing areas (outside the MPA) close to the Core Zone and Effective Management Zone of Sazani island resulted to be more productive than the fishing areas close to the Sustainable Development Zone of Karaburun peninsula.

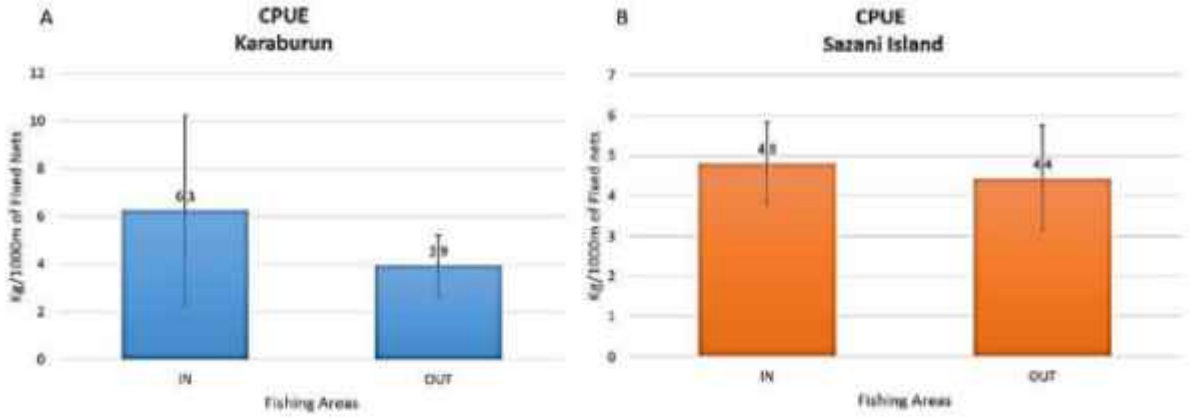

Figure 14. The comparisons of the average CPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), CPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of October; the CPUE is expressed as kg of fish per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

In addition, though no statistically significant differences exist between fishing inside Karaburuni and Sazani Island areas (Figure 15 and Figure 16) and outside these areas for the months of November and December, fishing outside the MPA resulted to be a little bit more productive than inside the fishing areas of Sustainable Development Zone of Karaburun and the Core Zone and Effective Management Zone of Sazani island; in all the graphics is interested to note that all the Sazani island fishing areas (inside and outside the MPA) were more productive than Karaburun peninsula areas.

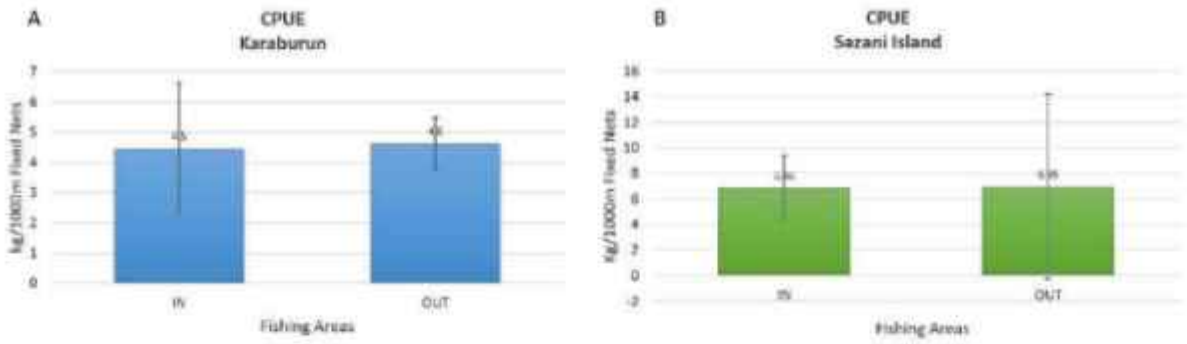

Figure 15. The comparisons of the average CPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), CPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of November; the CPUE is expressed as kg of fish per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

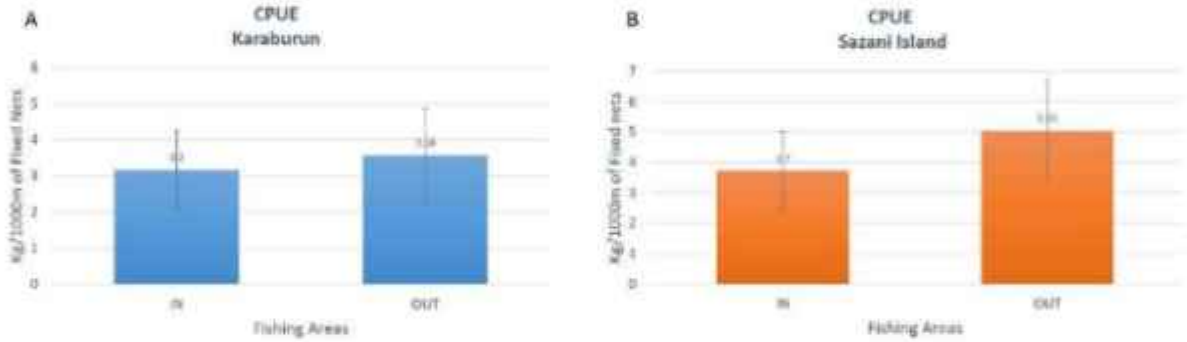

Figure 16. The comparisons of the average CPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), CPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of December; the CPUE is expressed as kg of fish per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

In January, though the differences in the comparisons between the CPUE values inside and outside the MPA were not significant ($p<0.05$), fishing inside the Sustainable Development Zone of Karaburun peninsula (Figure 17A) was slightly more productive than the fishing areas outside, but close to it, while fishing outside the Core Zone and Effective Management Zone of Sazani island (Figure 17B) resulted to be slightly more productive than the fishing areas located inside the MPA.

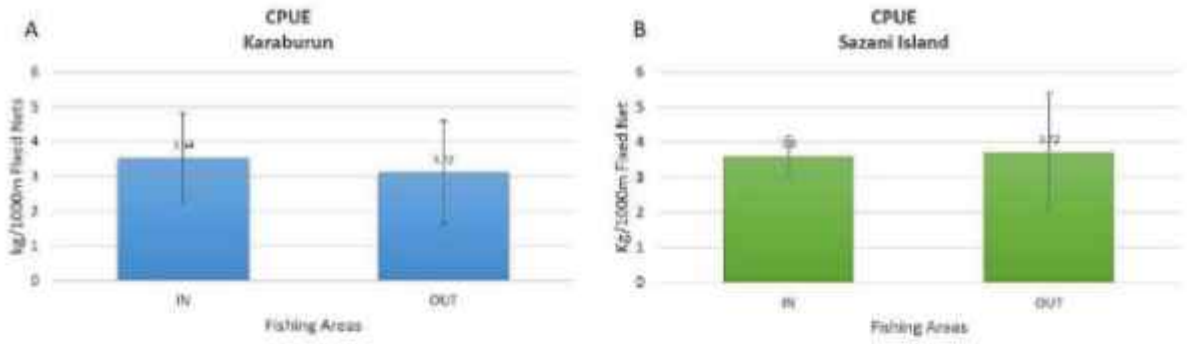

Figure 17. The comparisons of the average CPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), CPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of January; the CPUE is expressed as kg of fish per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

Similarly to January, no statistical difference were observed in the comparisons of the CPUE values for the month of February (Figures 18A and B). Both MPA fishing areas (Karaburun and Sazani Island) resulted to be slightly more productive than the fishing areas outside the MPA. It is also interesting to note that the relative profiles (Figures 18A and B) were similar between them.

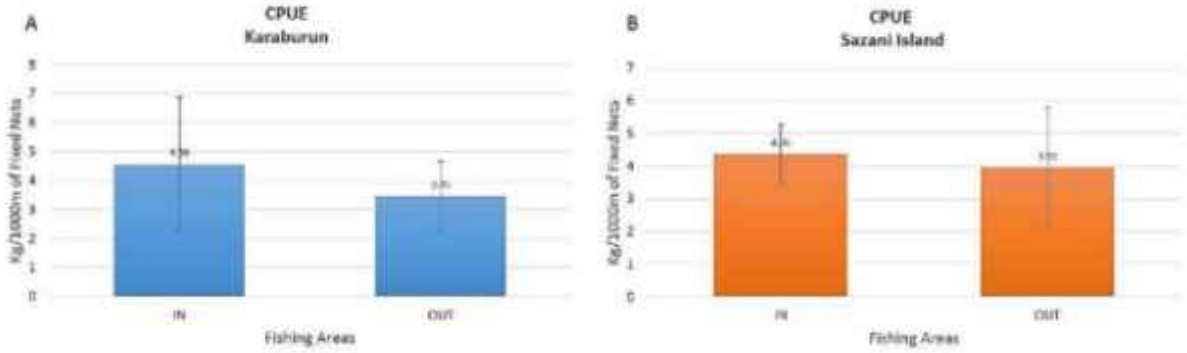

Figure 18. The comparisons of the average CPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), CPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of February; the CPUE is expressed as kg of fish per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

It was also calculated the Revenue per Unit of Effort (RPUE; Figures 19, 20, 21, 22, 23 and 24) and the Income per Unit of Effort (IPUE; Figures 25, 26, 27, 28, 29 and 30). Even in the case of comparisons between the RPUEs and IPUEs of different fishing areas, the application of t-test ($p<0.05$) showed no statistically significant differences between fishing inside Karaburuni or Sazani Island areas and outside them.

During the month of September, the most profitable fishing areas resulted to be the Core Zone and the Effective Management Zone of Sazani island (Figure 19 B, 33.8 EUR/1000m of deployed fixed nets), while the fishing areas close to the MPA (close to Sazani island and Karaburun) resulted to be similarly profitable for the fishers.

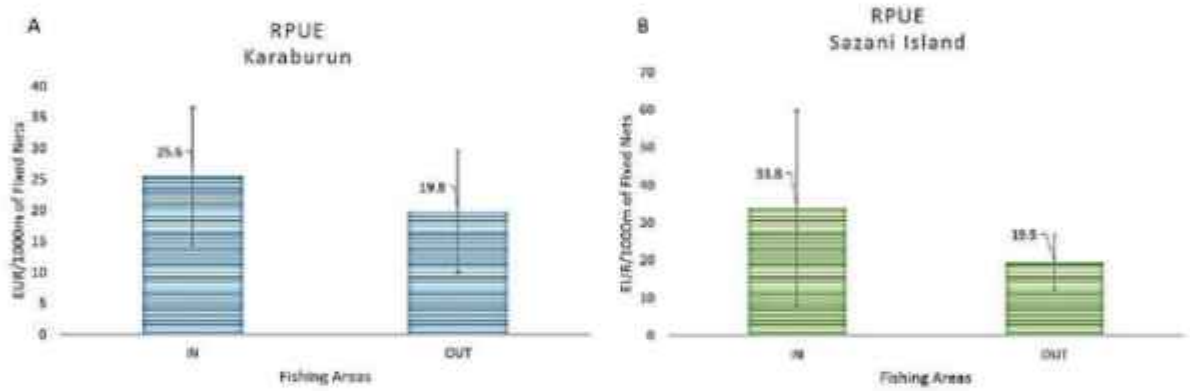

Figure 19. The comparisons of the average RPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), RPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of September; the RPUE is expressed as EUR (sold fish) per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

In the case of October month results (Figure 20), the most profitable areas for the fishers are represented by those inside the Sustainable Development Zone of Karaburun peninsula (28.5 EUR/1000 m of deployed fixed nets). The worst fishing areas resulted to be those close (but outside the MPA) to Karaburun peninsula. In the case of Sazani island landed catches monitoring during October, no differences were

observed from the data analyses of the profitability coming from selling the fish fished inside and outside the MPA.

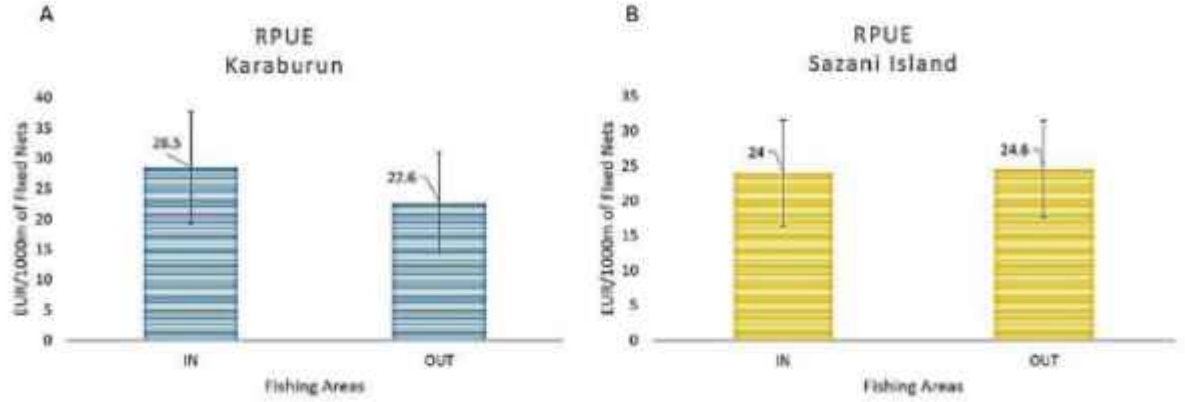

Figure 20. The comparisons of the average RPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), RPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of October; the RPUE is expressed as EUR (sold fish) per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

In addition, regarding November month results (Figure 21), the most profitable areas for the fishers are represented by those close (but outside the MPA) to the Sustainable Development Zone of Karaburun peninsula (27.46 EUR/1000 m of deployed fixed nets). The worst fishing areas are represented by those included inside the Sustainable Development Zone of Karaburun peninsula. Regarding Sazani island landed catches monitoring during November, fishing inside the Core Zone and Effective Management Zone of Sazani island resulted to be more profitable (32.74 EUR/1000 m of deployed fixed nets) the areas close, but outside the MPA.

In December (Figure 22), the fishing areas outside the MPA resulted to be more profitable than those inside the MPA (Karaburun peninsula: 19 EUR/1000 m of deployed fixed nets; Sazani Island: 40.7 EUR/1000 m of deployed fixed nets). As it is shown the profits coming from fishing close (but not inside the MPA) to Sazani Island

during the December months resulted to be twice profitable than the corresponding areas inside the MPA.

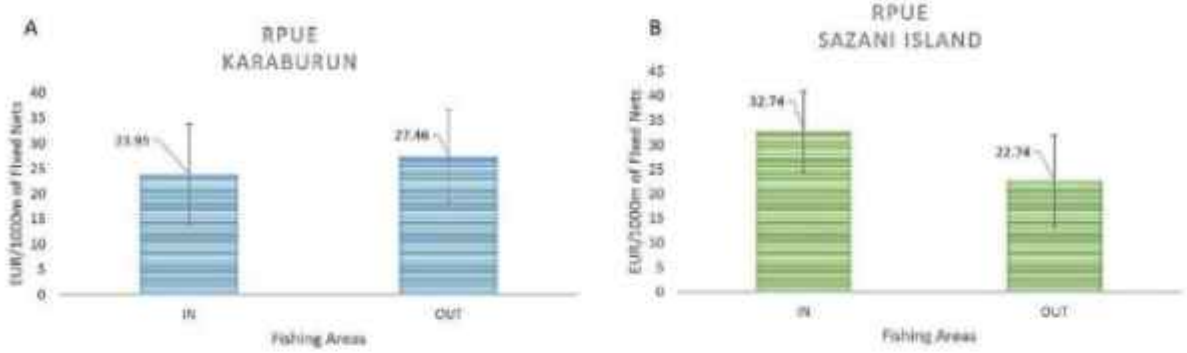

Figure 21. The comparisons of the average RPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), RPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of November; the RPUE is expressed as EUR (sold fish) per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

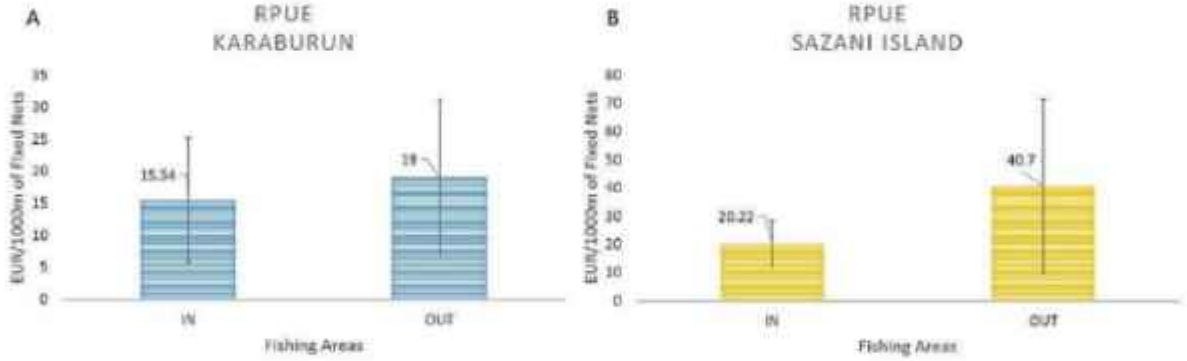

Figure 22. The comparisons of the average RPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), RPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of December; the RPUE is expressed as EUR (sold fish) per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

In the January of next year (2021), the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula (Figure 23A) resulted to be

more profitable than those corresponding to the fishing areas close to the MPA. Regarding the Sazani Island (Figure 23B), the profits coming from the small-scale fishing activities inside the Core Zone and Effective Management (23.39 EUR/1000 m of deployed fixed nets) resulted to be comparable to fishing areas inside the Sustainable Development Zone of Karaburun peninsula (22.7 EUR/1000 m of deployed fixed nets) and higher than the fishing activities close to the Sazani Island.

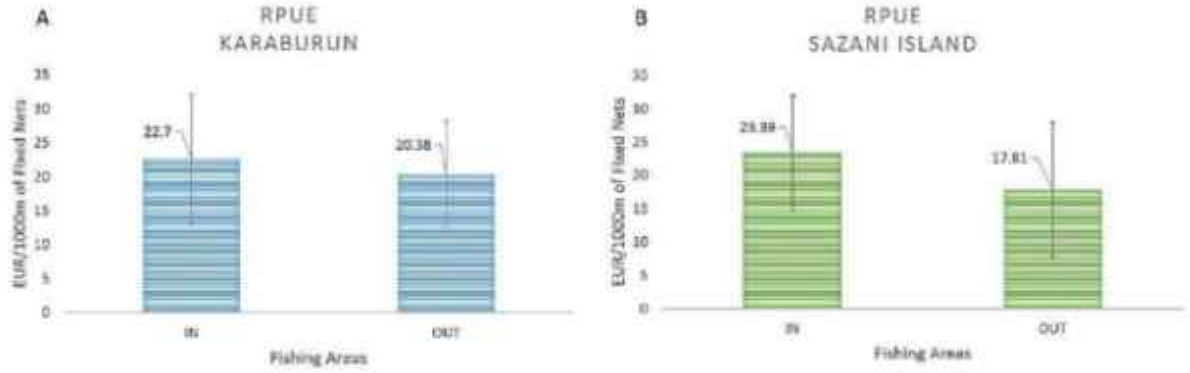

Figure 23. The comparisons of the average RPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), RPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of January; the RPUE is expressed as EUR (sold fish) per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

Similarly to the month of January, in February (Figure 24), all the fishing activities inside the MPA resulted to be more profitable than those corresponding to the areas close, but outside the MPA (Karaburun peninsula: 26.41 EUR/1000 m of deployed fixed nets; Sazani Island: 22.98 EUR/1000 m of deployed fixed nets), though the difference was not statistically significant ($p<0.05$), like in all the mentioned cases regarding the RPUEs.

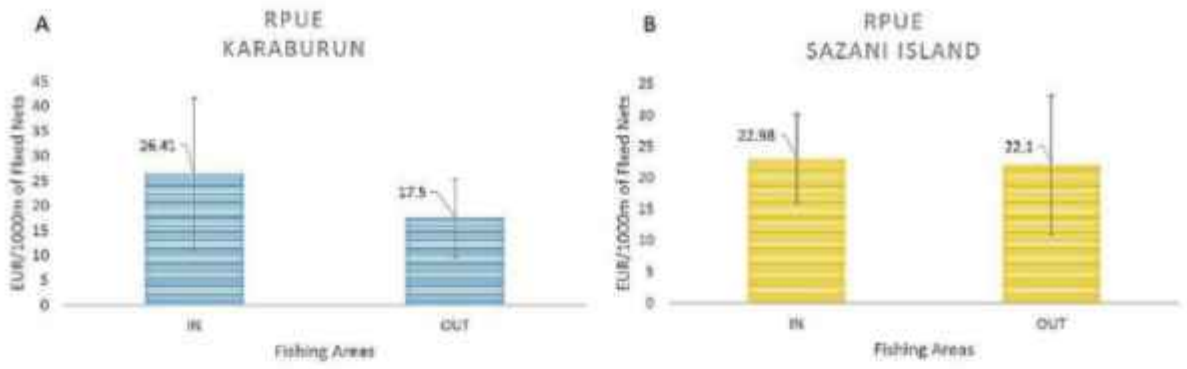

Figure 24. The comparisons of the average RPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), RPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of February; the RPUE is expressed as EUR (sold fish) per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

By subtracting the expenditures (oil cost) of the fishers, it was calculated the income of the fishers and the best fishing areas resulted to be inside the Sustainable Development Zone of Karaburun peninsula (Figure 25 and Figure 26) in September and October, though the month of October resulted to be the most profitable for the fishers considering their average incomes (15 EUR/1000m of deployed fixed nets).

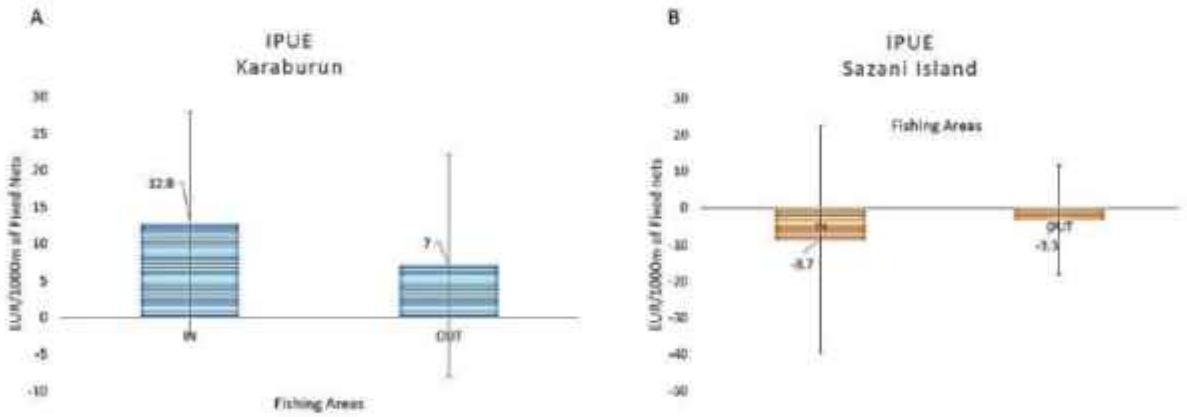

Figure 25. The comparisons of the average IPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), IPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of September; the IPUE is expressed as EUR (the remaining money to the fisher) per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

Furthermore, fishing inside the Core Zone and the Effective Management Zone of Sazani Island would not be recommended based on the results shown in the graphics of Figure 25 B and Figure 26 B, because the expenditures related to the consumed oil for reaching the fishing areas are higher than the revenues. In the case of fishing close to Sazani island during the month of October, it was reached an enormous value of average lost sum of money by the fishers (10.8 EUR/1000m of deployed fixed nets) – it means that the fishers were losing money during the time they were performing the fishing activities in this area.

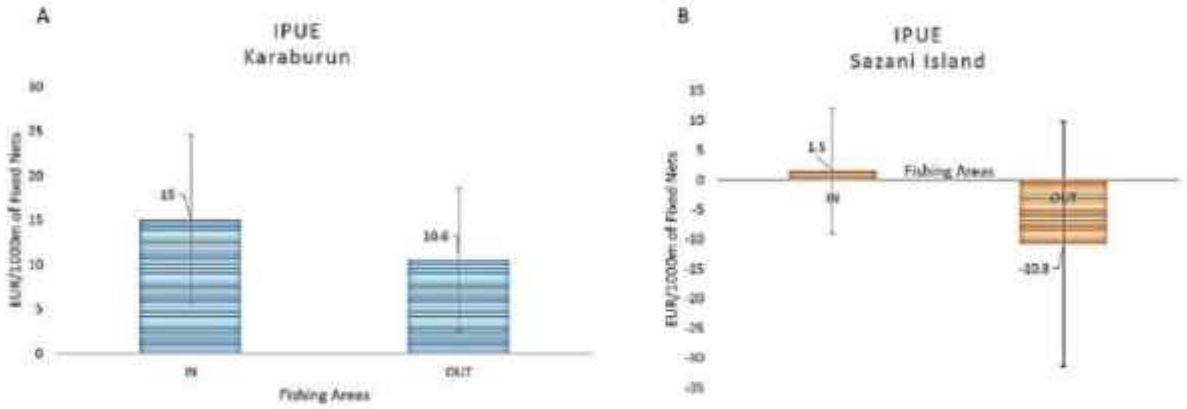

Figure 26. The comparisons of the average IPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), IPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of October; the IPUE is expressed as EUR (the remaining money to the fisher) per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

Below are shown the graphics corresponding to the comparisons of the average IPUE values of November, December, January and February (Figure 27, 28, 29 and 30), respectively. In November (Figure 27A), it is strange to note that fishing close to the the Sustainable Development Zone of Karaburun peninsula would be more profitable than fishing inside it, if it would be the case to consider the expenditures related to the oli consumption of the small-scale fishing vessels (inside: 11 EUR/1000m of deployed fixed nets; outside: 15.6 EUR/1000m of deployed fixed nets), while fishing outside, but close to the the Core Zone and Effective Management Zone of Sazani island

(Figure 27B) would result in a loss of money (-8.83 EUR/1000m of deployed fixed nets).

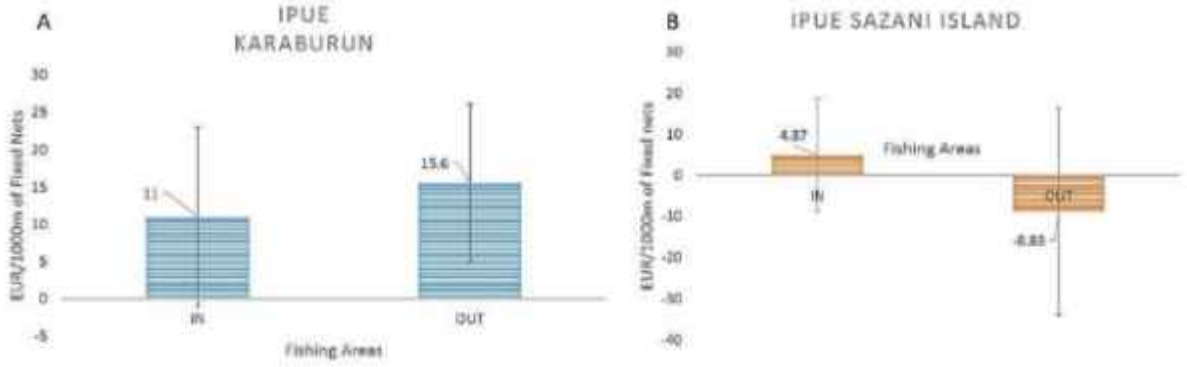

Figure 27. The comparisons of the average IPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), IPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of November; the IPUE is expressed as EUR (the remaining money to the fisher) per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

In December (Figure 28), it was evidenced that the fishing activities outside the MPA were providing profits to the small-scale fishers (Karaburun peninsula: 8.46 EUR/1000m of deployed fixed nets; Sazani Island: 12.9 EUR/1000m of deployed fixed nets), while those inside the MPA were making them lose money (Karaburun peninsula: -4.1 EUR/1000m of deployed fixed nets; Sazani Island: -9.3 EUR/1000m of deployed fixed nets). As it is shown in the graphic of Figure 28, meanwhile the standard deviation value of the IPUE was high inside the Sustainable Development Zone of Karaburun peninsula, the corresponding standard deviation value of the IPUE was low (and negative) inside the Core Zone and Effective Management Zone of Sazani island, which means that the relative fishers were losing money from the oil consumption without getting sufficient profits from selling the catches.

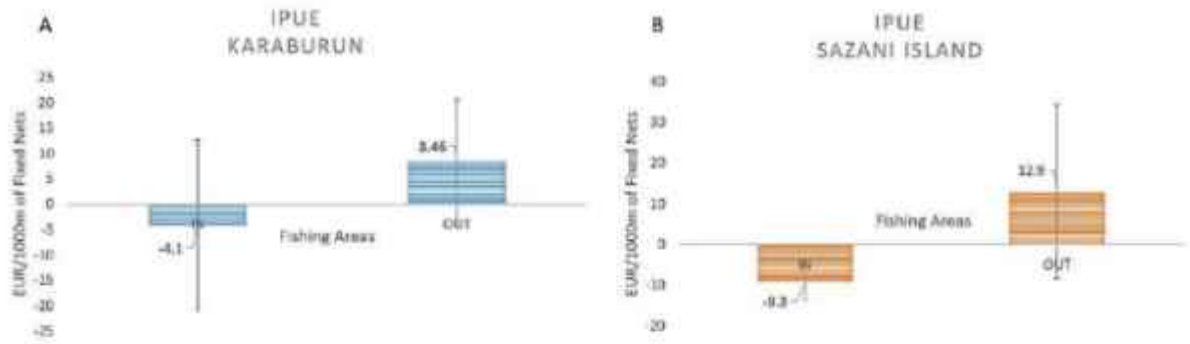

Figure 28. The comparisons of the average IPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), IPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of December; the IPUE is expressed as EUR (the remaining money to the fisher) per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

During the months of January and February 2021 (Figures 29 and 30), the small-scale fishers were losing money by performing fishing activities close and inside the Core Zone and Effective Management Zone of Sazani island, while the lost money during February were higher during February (the highest in comparisons to all the considered months of fisheries catches monitoring; in the areas close the Sazani Island: -15.76 EUR/1000m of deployed fixed nets)

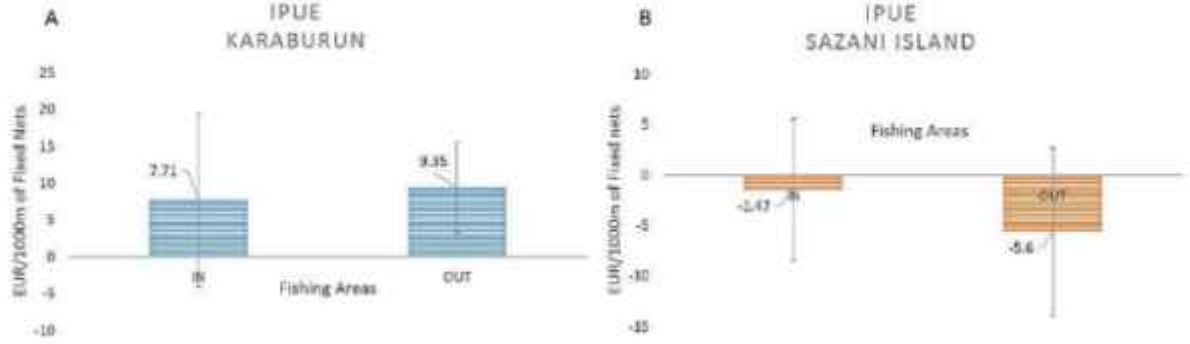

Figure 29. The comparisons of the average IPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), IPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of January; the IPUE is expressed as EUR (the remaining money to the fisher) per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

Regarding the Karaburun peninsula (Figures 29A and B), the small-scale fishing activities outside the MPA resulted to be more profitable than those inside the MPA (outside, but close to the Sustainable Development Zone: 9.35 EUR/1000m of deployed fixed nets), while the contrary happened in February, where the average IPUE value was 9.58 EUR/1000m of deployed fixed nets inside the Sustainable Development Zone of Karaburun peninsula.

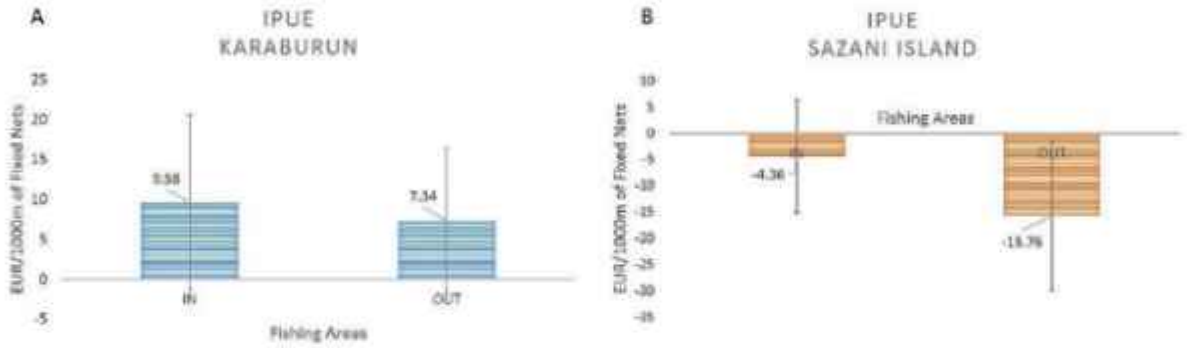

Figure 30. The comparisons of the average IPUEs of the small-scale fishing activities inside the Sustainable Development Zone of Karaburun peninsula and the fishing areas outside it (A), IPUEs of the fishing activities inside the Core Zone and Effective Management Zone of Sazani island and the fishing areas outside it (B) during the month of February; the IPUE is expressed as EUR (the remaining money to the fisher) per 1000m of trammel net deployed in the fishing area; barrels represent the standard deviation values.

Conclusions

One of the outputs of the project is represented by the successful implementation of the monitoring approach on local fisheries data collection in the MPA of Karaburun-Sazni, based on previously used methodology developed in the framework of the FISHMPABLUE2 project.

It takes into account several biological, social and economic factors in order to have affordable indicators by the socio-economic point of view on the interest of the small-scale fishers and the biological point of view on the interest of all the humanity and the coming generations (biodiversity conservation).

Biological Indicators

Based on the catch composition (Figure 1, 2, 3, 4, 5 and 6) and fished biomass (Figure 7, 8, 9, 10, 11 and 12) as biological indicators, it was indicated that there is a high biodiversity of the fished species, characterized by pelagic and demersal fish species and mollusks (common cuttlefish) and no substantial difference emerged out in the comparison between the fishing areas inside and outside the MPA of Karaburun-Sazani, where the abundance was nearly the same in the comparison between the fishing areas (inside vs outside the MPA).

It mean that a better management of the small-scale fisheries is needed in these areas, Bay of Vlora and Karaburun-Sazani MPA.

This could be done by adapting the working strategy of the Torre Guacetto MPA.

Socio-Economic Indicator

The CPUE, RPUE and IPUE are economic indicators which take into account the social aspects of the involved people in the fishing sectors. The results of the monthly CPUEs (Figure 13, 14, 15, 16, 17 and 18) and RPUEs (Figure 19, 20, 21, 22, 23 and 24) indicated that there is higher production and revenues inside the MPA (except the month of December), but the corresponding differences are not statistically significant or better expressed can be defined as slight differences,

which suggest a better management of the MPA in terms of biodiversity conservation and a better management of the fisheries sector close to the MPA.

It is also taken into account the IPUE analyses (Figure 25, 26, 27, 28, 29 and 30). In September and October fishing inside the MPA "fishing areas" of Karaburun peninsula resulted to provide more incomes to the fishers, though the differences were not statistically significant for a $p<0.05$. In the other months the fishing activities

outside the MPA (taking into consideration only the Karaburun) resulted more beneficial for the fishers in comparison to the MPA fishing areas).

Regarding Sazani Island, the monitoring results showed that it would not be convenient for the fishers of Radhime to go fishing close or around the Sazani Island. During the months of January and February, it resulted even worst for the fishers, because instead of getting profits from the fishing activities, they were losing money, because the oil cost expenditures resulted to be higher than the profits coming by selling the fish.

It would be highly suggested not to go for fishing in the areas inside and close to the EMZ and CZ of Sazani, because there is no considerable net profit from the fishing activities in these areas (when taking into account only the small-scale fishers of the Fishing Center Oriku).


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The Interim SSF Catch Monitoring Report was prepared by the Main Researcher/Key Expert

Rigers Bakiu (subcontracted by Flag Pine and member of Albanian Center for Environmental Protection and Sustainable Development – ACEPSD)