FAIRSEA (ID 10046951)

"Fisheries in the AdriatIc Region - a Shared Ecosystem Approach"

D 2.5.2 – Factsheets and policy papers

Work Package:	WP2, Communication activities Activity 2.5: Media relation and publication
Type of Document	Three Factsheets and one policy paper which are dealing with topics related to ecosystem approach and sustainable use of marine resources were prepared and used in the project activities
Use	Public
Responsible PP	PP01-IOF (Institute for Oceanography and Fisheries)
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Deliverable 2.5.2

Factsheets and policy papers

FAIRSEA – Fisheries in the Adriatic Region – a shared Ecosystem Approach

FAIRSEA is financed by Interreg V-A IT-HR CBC Programme (Priority Axis 1 – Blue innovation)

Start date: 01 January 2019

End date: 31 August 2021

Contents

Acronyms used

AB	Advisory Board
CFP	Common Fisheries Policy
CM	Communication Manager
EAF	Ecosystem Approach to Fisheries
EAFM	Ecosystem Approach to Fisheries Management
FAIRSEA	Fisheries in the AdrIatic Region – a Shared Ecosystem Approach
FS	Factsheet
JS	Joint Secretariat
KoM	Kick-off Meeting
LP	Lead Partner
MA	Managing Authority
OGS	Istituto Nazionale di Oceanografia e di Geofisica Sperimentale - OGS
PA	Partnership Agreement
PC	Project Coordinator
PM	Project Manager
PMU	Project Management Unit
PP	Project Partner
SC	Steering Committee
TC	Technical Committee
WP	Work packages
WSM	Web/social media Manager

INTRODUCTION

The FAIRSEA project (Fisheries in the AdrIatic Region – a Shared Ecosystem Approach) aims at enhancingtransnational capacity and cooperation in the field of an ecosystem approach to fisheries (EAF) in the Adriatic region by exchanging knowledge and sharing good practices among partners. The complementary expertise of the partners is shared, interlinked and integrated, considering also challenges and opportunities identified by stakeholders.

Communication to general public and stakeholders is crucial for the effective dissemination of the importance of ecosystem approach and its effect on the society at large. Social media represent a crucial channel that support the project website to disseminate project activities and results, as well as promote specific events and news related to the partnership.

About FAIRSEA Project

The overall objective of FAIRSEA is to enhance the conditions for implementing innovative approaches in the sector of sustainable fisheries management in the Adriatic Sea in conformity with the Common Fisheries Policy (CFP). This is done through the development of a shared conceptual and operational framework for an Ecosystem approach to fisheries (EAF). It will be achieved through the implementationof a spatially explicit and territorially integrated tool that considers water mass circulation, physical- chemical properties, plankton productivity, dynamics of resources including their interactions, fisheries displacement and bio-economic drivers. The technical integration is adapted to address stakeholders' and policy makers' issues and is used for increasing awareness, for understanding EAF, for increasing technical skills and capacities in the region also through demonstrative applications. The platform results in a high technological and innovative tool for EAF to be useful for policy makers, institutions and organizations and might require patent. Overall objective will be achieved through three specific objectives as in the following.

Project specific objectives

- Enhance trans boundary integrated competence in the field of ecosystemapproach to fisheries
- Implement a shared "state of the art" integrated platform for the region
- Share benefits and challenges of ecosystem approach to facilitate the achievementof CFP objectives.

Communication activities in the FAIRSEA Project

The main objective of communication activities is to present FAIRSEA results, achievements and tools to all interested parties and deploy project results to key stakeholder, end users and the public. Communication and dissemination activities will be performed at the regional, national and international level, and outputs and results of the project will be transferred outside the partnership.

In particular FAIRSEA aims at enhancing awareness of ecosystem approaches, as a basis for long lasting effects on its activities. Stakeholder and public engagement is thus central to the success of FAIRSEA, which aims at broadening stakeholder participation in fisheries management and at disseminating ecosystem views and concepts beyond partnership.

A set of tools online and printed were developed in order to bring closer scientists, policy makers and end-user communities while making all understanding the benefits of a sustainable management of Adriatic fisheries.

For media relation and publications different tools will be used:

Tool	Target group	Objective	Use
Press releases	General public	disseminate specific project milestones and achievement of deliverables	distribution to international, national and local media (radio, television, newspaper, periodical)
Scientific papers	Academia and scientific community	achieving a good disciplinary and international spread	Scientific fora, international journals
Factsheets	Different targets	Promote results of the research undertaken	Distribute widely with all FAIRSEA means
Policy paper	Fishermen association, policy makers, working groups	Promote results of the research undertaken	Distribution to technical working group dedicated to policy makers

FAIRSEA Policy paper

An important working group in Adriatic for the fisheries policy is the FAO AdriaMed Project, that was also a crucial working group for developing the FAIRSEA project. Therefore the partnership agreed on the importance of contributing to this working group with a policy paper.

A policy paper was developed with the title “Contribution for the standardization and modelling of survey abundance indices in the Adriatic Sea” and prepared by Simone Libralato, Diego Panzeri [LP-OGS], Roberto Carlucci, Cipriano Giulia, Pasquale Ricci, Maddalena Laggini, Chiara Manfredi, Corrado Piccinetti [PP06-CONISMA], Walter Zupa, Isabella Bitetto, Loredana Casciaro, Maria Teresa Spedicato[PP05-COISPA] Nedo Vrgoč, Igor Isajlovic [PP01-IOF], Svjetlana Krstulović Šifner [PP10-UNIST], Francesco Masnadi, Giuseppe Scarcella [PP03-CNR] and with the contribution by Tommaso Russo [external expert: Department of Biology - University of Rome Tor Vergata].

The policy paper (presented in the following) has been delivered to the FAO AdriaMed Project and was presented as contribution at the FAO GFCM Subregional Committee of the Adriatic Sea (April 2021).

A letter by the Fisheries Information Office of the Adriamed Project is also included (see below).

Contribution sent to FAO-Adriamed April 2021

Contribution for the standardization and modelling of survey abundance indices in the Adriatic area

It is of paramount importance to increase the accuracy of scientific information used to inform management (Spedicato et al., 2019). Although the scientific bottom trawl surveys provide quantification of abundance and biomass indices by species through a standardized monitoring program, the data obtained need statistical treatment to reduce unavoidable small deviances (e.g., the sampling period) or changes (e.g., vessel) during sampling. Further, environmental variables might be useful for the extrapolation of indices to the area domain. Significant efforts are required for the standardization of scientific survey data (e.g. MEDITS, GRUND, SOLEMON) prior to their use. The work developed by Wood (2017), investigating the use of Generalized Additive Models (GAM), as well as the application of zero-inflated models (Zuur et al., 2012) were considered as starting points for developing the methodology to be applied to the survey indices. For LFDs standardization the approaches developed in Assunçao et al. (2003) and Macdonald and Du (2018), under the hypothesis that the observed LFDs can be expressed as combination of probability functions (e.g. Gaussian, Lognormal, Gamma, etc.), were investigated. Initiatives were undertaken in the AdriaMed project, to identifying methods, procedures, developing case studies and tools to assist and support the standardization process related to the survey abundance estimates. This process started in scoping meetings and then the tools developed were applied to case studies and, furthermore, the approach was expanded for modelling the spatial distribution of key demersal species. Main achievements are below summarised

BioStand

BioStand is a survey data analysis support software realized to guide users toward the indices time series standardization, in case discontinuities in the survey protocol were introduced along the time series. BioStand is the result of the work started during AdriaMed meetings on the standardization of survey data (e.g. the one held in Fano on January 2019). This software uses the Generalized Additive Model (GAM) approach, one of the most frequent approaches applied to fishery dependent and independent data standardization. BioStand uses a four steps process: data preparation, explorative analysis of data, modelling and time series standardization. The modelling phase supports the user in selecting the best model, using different types of response variable transformations, supporting the selection of the best model by mean of the forward stepwise inclusion of the most informative variables and testing the models using different family distributions (Gaussian, quasi-Poisson and Tweedie). As results, BioStand provides the annual maps of the best model's predictions and the standardized indices time series.

Length Frequency Distribution standardization

Being the recruitment from survey an important information to provide to the stock assessment model, together with the recruitment from the catches, a standardization of *Mullus barbatus* LFDs' time series was carried out as case study on GSAs 17 and 18 combined and separated, in order to use LFDs derived for "anomalous years". The LFD's standardization was firstly presented at WGSAD 2018, while further results were presented at AdriaMed virtual meetings held on May and August 2020. The methodological approach is based on the decomposition and characterization of annual LFDs, obtained from original survey data, in terms of parameters of the distributions (e.g. mean, standard deviation), and the weight of each distribution in the sum. Each parameter of the detected distributions is modelled separately from the other, varying the level of complexity according to the available data. The outcome of the analysis is a set of parameters and weights fitted by the models used to characterize the theoretical LFD of the survey in the reference month of the survey. These can be then used in a stock assessment model for the years in

which the survey was carried out outside the standard season in the protocol. These results can be useful to explore the impact of biased LFDs on the results of the stock assessment.

BioIndex

BioIndex, developed and released with BioStand, allows to perform MEDITS-like survey data analysis at different levels. Starting from the MEDITS data exchange format (TA, TB and TC), the routine is able to estimate the time series of a wide pool of population state-indicators for the selected species. BioIndex also offers the possibility to perform both nonparametric (Spearman rho test) and parametric statistical trend analysis (Intersection Union Test) over both abundance and biomass time series. Furthermore, BioIndex software also offers the possibility to perform a simple spatial analysis on a selected batch of the above-mentioned indices, estimating the average of a recent time span (for example 5 or 10 years) over the GFCM 30" spatial grid. Finally, bubble plots of recruits and spawners abundance indices by haul are provided to approximate the identification of areas where critical life stages (juveniles and spawners) are more concentrated.

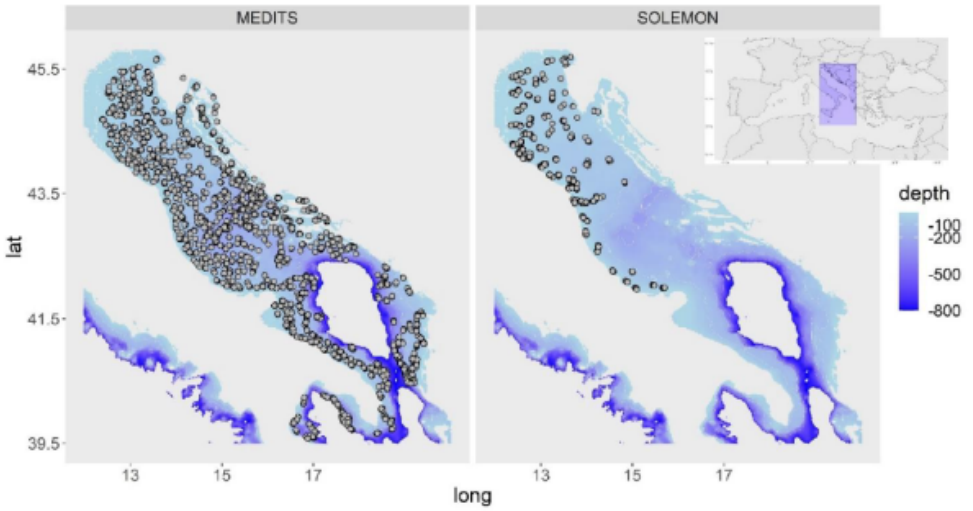

Figure 1: Area of study and the Hhaul position (from 2008-2018) for the two surveys in the Adriatic-Ionian sea: the MEDITS trawl survey (left panel) and the SOLEMON trawl survey (right panel).In the right part of the plot is represented the Mediterranean sea and the study area in a shade blue box.

The contribution of the Interreg IT-HR FAIRSEA project to the standardization and modelling approach

In the Interreg IT-HR FAIRSEA project (Fisheries in the Adriatic Sea – A Shared Ecosystem Approach) analysis and standardization of trawl survey data were carried out in a workshop dedicated using R-routines BioIndex and BioStand (available at: https://www.coispa.it; Zupa et al., 2020). The results for several demersal species monitored through MEDITS and SOLEMON (Figure 1) were summarized in a project deliverable (Carlucci et al., 2019). Furthermore, an additional effort was carried out to examine the effects of additional variables to better represent the distribution of species (Panzeri et al., 2021). The approach ad results are summarized in the following sections.

Biomass indices of demersal fish from scientific trawl surveys carried out in the Adriatic Sea and in the Western Ionian Sea (GSA 17, 18, and 19) were analyzed with a set of Generalized additive models (GAM), using the spatiotemporal hauls data (month, year, depth, latitude, longitude) as explanatory variables. Moreover, to test improvements in performances, additional relevant biogeochemical and physical variables and the distribution of fishing effort were also used.

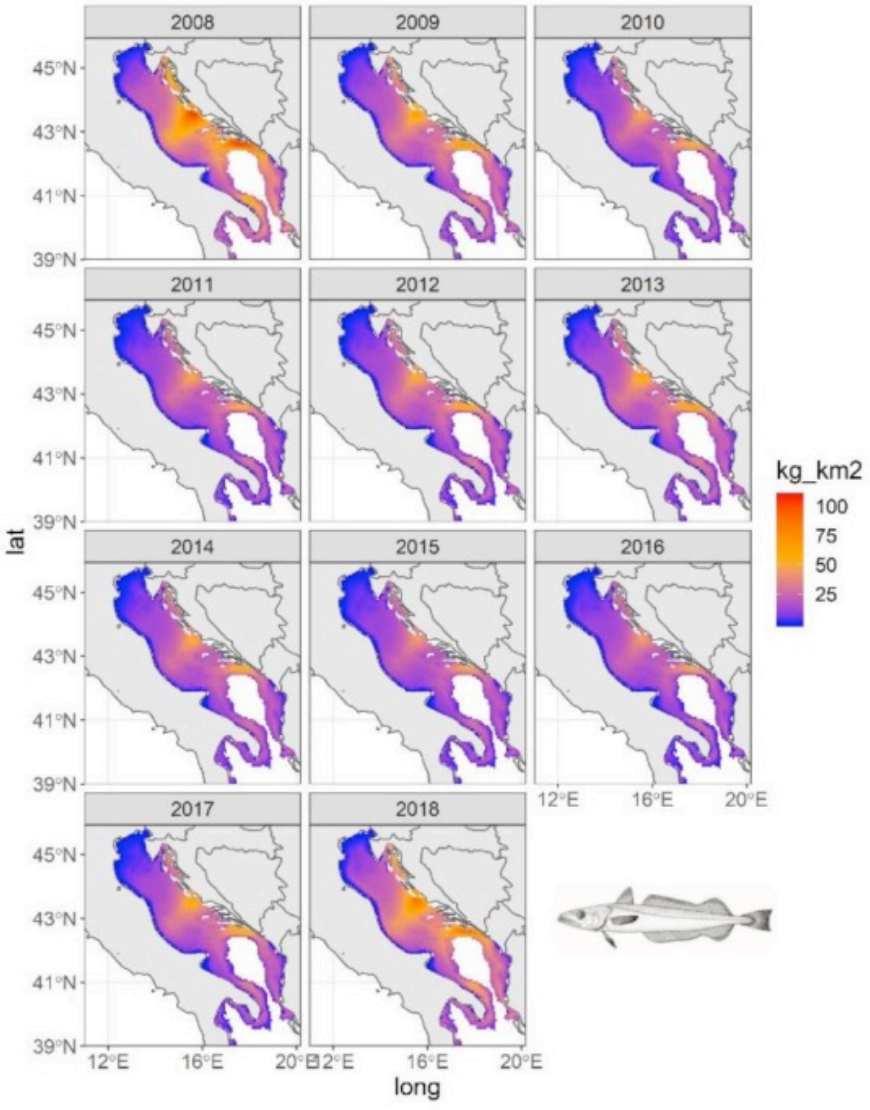

Figure 2: Yearly maps of estimated biomass (kg/km²) European hake Adriatic Sea (GSA 17-18) obtained with the best GAM model applied on MEDITS trawl survey data for years 2008-2018 and with all the additional environmental and effort variables.

Indices of demersal species biomass (kg/km^2) were retrieved from the MEDITS dataset for European hake (*Merluccius merluccius*) and red mullet (*Mullus barbatus*) and from the SOLEMON dataset, from 2008-2018, for common sole (*Solea solea*), mantis shrimp (*Squilla mantis*) and common cuttlefish (*Sepia officinalis*). The relevant oceanographic variables considered were the water temperature (C°) and dissolved oxygen (mmol/m^3) at the sea bottom, water column averages of nitrate and phosphate concentration (mmol/m^3), chlorophyll-a (mg/m^3), particulate organic carbon (mg/m^3), pH and salinity that were taken from Copernicus Marine Environment Monitoring Service (CMEMS). Commercial trawling effort expressed as trawling time (in hours) per year at a spatial resolution of 1/16° was estimated from VMS/AIS data for the period 2008-2018 (Russo et al., 2014) and was tested as explanatory variable based on the evidence that fishing effort is a good track of species density. The explanatory variables were preliminarily selected by species using the VIF approach (Variance Inflation Factor) with a threshold of VIF<5 to avoid collinearity (Sion et al., 2019).

A back-stepwise approach was used by starting from the most complete model (with the spatiotemporal variables, meaningful biogeochemical, physical variables, and fishing effort) to the model with spatiotemporal variables only (6-7 combination of variables were used for each species). Training (on 70% of the data) and testing (on the remaining 30% of the dataset) were repeated using 50 runs on datasets randomly selected and without replacement. Different GAM distribution families were applied (Gaussia, Tweedie, and Delta-GAM) with performances specific by species evaluated through explained deviance (%ED) and prediction errors (AIC, Akaike Information Criterion) on the training datasets as well as correlation coefficient (R^2) of the model predictions on the testing dataset.

For European hake, mantis shrimp and common cuttlefish the Delta-GAM models were performing better while for the red mullet and common sole the best results were obtained using the Gaussian model and Tweedie, respectively. The results highlighted that adding specific oceanographic and effort covariates to spatiotemporal variables improved the performances of spatial distribution models especially for European hake, mantis shrimp, and red mullet. Significant additional explanatory variables were bottom temperature, bottom dissolved oxygen, salinity, particulate organic carbon, and fishing effort for European hake; the same variables and pH for mantis shrimp; chlorophyll-a, pH, sea surface temperature, bottom dissolved oxygen, nitrate, and effort for the red mullet; phosphate and salinity for common sole; bottom temperature, bottom dissolved oxygen, and phosphate for the common cuttlefish.

The chosen model for each species is used to obtain maps of the biomass distribution (kg/km^2) on the most relevant month (July and November, for MEDITS and SOLEMON species, respectively). The grid of regular points with the same resolution of the selected CMEMS product (1/16°) was used to predict the species biomass. As an example in Figure 2 is reported the best model representation of hake, using the Delta-GAM model with all the explanatory variables. The work resulted in a scientific publication (in press) on the Journal of Operational Oceanography as a contribution to the Ocean State Report 5 (Copernicus), which the authors refer for all the details.

Acknowledgements

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References

Assunçao H. F., Escobedo J. F., Oliveira A. P (2003). Modelling frequency distributions of 5 minute-averaged solar radiation indexes using Beta probability functions. Theor. Appl. Climatol. 75: 213–224. DOI 10.1007/s00704-003-0733-9

Carlucci Roberto, Cipriano Giulia, Pasquale Ricci, Maddalena Laggini, Chiara Manfredi, Corrado Piccinetti, Walter Zupa, Isabella Bitetto, Loredana Casciaro, Maria Teresa Spedicato, Francesco Masnadi, Giuseppe Scarcella, Diego Panzeri, Simone Libralato (2019). Deliverable 4.3.1-Spatio-temporal distribution of marine species. Fisheries in the Adriatic Sea – A Shared Ecosystem Approach

(FAIRSEA), Project Interreg V-A IT-HR CBC Programme (ID 10046951). 155 pp.

Macdonald P., Du J. (2018). Mixdist: Finite Mixture Distribution Models. R package version 0.5-5. https://CRAN.R-project.org/package=mixdist

Panzeri D., Bitetto I., Carlucci R., Cipriano G., Cossarini G., D'Andrea L., Masnadi F., Querin S., Reale M., Russo T., Scarcella G., Spedicato M.T., Teruzzi A., Vrgoč N., Zupa W., Libralato S. (2021) Developing spatial distribution models for demersal species by the integration of trawl surveys data and relevant ocean variables. Journal of Operational Oceanography, in press.

Russo, T., D'Andrea, L., Parisi, A., and Cataudella, S. (2014). VMSbase: an R-Package for VMS and logbook data management and analysis in fisheries ecology. PLoS ONE 9:e100195. doi: 10.1371/journal.pone.010 0195.

Sion L., W. Zupa, C. Calculli, G. Garofalo, M. Hidalgo, A. Jadaud, E. Lefkaditou, A. Ligas, P. Peristeraki, I. Bitetto, F. Capezzuto, R. Carlucci, A. Esteban, C. Follesa, B. Guijarro, Z. Ikica, I. Isajlovic, G. Lembo, C. Manfredi, J. L. Pérez, C. Porcu, I. Thasitis, G. Tserpes, P. Carbonara. (2019). Spatial distribution pattern of European hake, Merluccius merluccius (Pisces: Merlucciidae), in the Mediterranean Sea. Scientia Marina, 83S1: 21-32.

Spedicato M.T., Massutí E., Mérigot B., Tserpes G., Jadaud A., Relini G. (2019). The MEDITS trawl survey specifications in an ecosystem approach to fishery management. Sci. Mar. 83S1: 9-20. https://doi.org/10.3989/scimar.04915.11X.

Wood S.N. (2017). Generalized Additive Models: An Introduction with R (2nd edition). CRC/Taylor & Francis.

Zupa W., L. Casciaro, I. Bitetto, M.T. Spedicato. 2020. BioIndex v.2.1.2

Zuur A.F., Saveliev A. A., Ieno E.N. (2012) Zero Inflated Models and Generalized Linear Mixed Models with R. Newburgh, Scotland: Highland Statistics Ltd.

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Our Ref.: GCP/RER/010/ITA AdriaMed Project

Your Ref.:

Rome, 22 October 2021

To whom it may concern,

This is to certify that the document "Contribution for the standardization and modelling of survey abundance indices in the Adriatic Sea" prepared by the FAIRSEA project (Fisheries in the Adriatic Sea – A Shared Ecosystem Approach) funded by the 2014 - 2020 Interreg V-A Italy - Croatia CBC Programme (Standard project ID 10046951) has been delivered to the FAO AdriaMed Project and presented as contribution at the FAO GFCM Subregional Committee of the Adriatic Sea (April 2021).

Yours sincerely,

Nicoletta Milone
Fisheries Information Officer
AdriaMed Project

Factsheets

Factsheets were developed to be distributed at seminars, conferences, and other events involving FAIRSEA. In particular 5 factsheets were developed to describe:

- **Factsheet 1 - Secondary school and university seminars developed by FAIRSEA**– developed by T. Kuzmičić [PP8-SUNCE]

- **Factsheet 2 - The FAIRSEA Playdecide discussion game** developed by G. Massolino, A. Lanza, S. Libralato [LP-OGS] and T. Kuzmičić [PP8-SUNCE]

- **Factsheet 3 - The Fish n'Ships card game** developed by S. Libralato, D. Agnetta, I. Celic, D. Panzeri, G. Massolino [LP-OGS] with the collaboration of D. Manna [external: White Cocal Press].

- **Factsheet 4 - Identify Essential habitats in Adriatic and Ionian Seas** developed by D. Panzeri and S. Libralato [LP-OGS]

- **Factsheet 5- Second Advanced school on Ecosystem Approach to Fisheries** developed by Svjetlana Krstulović Šifner [PP10-UNIST]

The factsheets were used in disseminating events to advertise results and achievements of FAIRSEA. In the following they are reproduced.

Factsheet 1 - Secondary school and university seminars developed by FAIRSEA

Interreg Italy - Croatia FAIRSEA

FAIRSEA

Fisheries in the Adriatic region
a **shared ecosystem approach**

Secondary school and university seminar

RATIONALE: As part of the FAIRSEA project, Sunce Association Split conducted a workshops series on the topic of Ecosystem approach to fisheries. The workshops were intended for high school and university students, and were conducted in three parts for each group. The first workshop covered the theoretical part of fisheries in the Adriatic and threats to biodiversity; The second workshop included a field part and the last workshop included working with young people on the topic of ecosystem approach to fisheries through interactive games designed and created within the project (Discoussion game and Food web card game)

RESULT: As part of the workshops series, a total of 4 secondary schools in Split (Croatia), 5 different faculties of the University of Split and 1 primary school on the island of Vis were included. A total of 15 workshops were held and 223 participants were involved

BENEFITS FOR AN ECOSYSTEM APPROACH TO FISHERIES: All workshops aimed to increase knowledge about the ecosystem approach to fisheries, sustainable exploitation of marine resources and transnational cooperation using interactive games (Food web card game and Discussion game) designed through this project. Through seminars students get acquainted with the issue of fisheries and tried to find a solution for sustainable management of fish resources

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Factsheet 2 - The FAIRSEA Playdecide discussion game

Interreg Italy - Croatia FAIRSEA EUROPEAN UNION

FAIRSEA

Fisheries in the Adriatic region a shared ecosystem approach

WP 2 Act. X2.3 Promotional material production

Discussion game - PlayDecide

Objective The main aims of the projects is to ensure cooperation and capacity building among the partners and stakeholders, often with conflicting interests, involved in fisheries within the Adriatic Sea. For this reason was chosen the Playdecide platform, since it allows to talk in a simple, respectful and fact-based way about controversial issues, in this case fisheries, in which different actors can proactively discuss the main issues and elaborate practical solutions in terms of policy and management.

Structure The game is composed by: 23 info cards, 25 issue cards, 16 challenge cards, 10 story cards, and 5 policy positions (statements representing different approaches to fisheries management). At the end of the game, the participants divided per groups should vote the policy position that they endorse, according with the character they picked up among the story cards. If no one of the policy positions gain at least a highly agreed consensus, then the group may elaborate a different policy and vote for it.

Outcomes The game enables players to get familiar with a question, see it from different perspectives and form or clarify their own opinion and immedesimate in other actors' view on an issue. PlayDecide also invites players to look at issues as a group, needing to reach a common consensus. The results of the playing sessions can be recorded, providing interesting data.

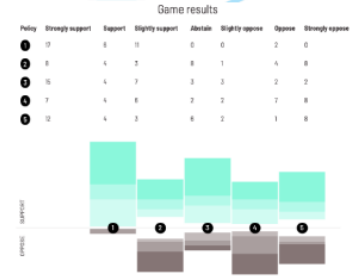
Sessions performed so far

13/09/2019 Advanced Master in Sustainable Blue Growth a.y. 2018/2019. 9 pax, experts

25/09/2019 Deep Blue project's training. 18 pax, experts

27/09/2019 *Trieste Next: science festival.* 10 pax, general public.

Game results



Policy positions

1.We need to ensure that fishing and aquaculture are environmentally, economically and socially sustainable and that they provide a source of healthy food for citizens. Although it is important to maximize catches, there must be limits and control in order to give priority to habitat protection. We need to reduce catches in order to make sure that fishing practices do not affect the reproduction of fish populations.

2.Even if geographically constrained, less developed countries along the Mediterranean coast should claim their EEZ (Exclusive Economic Zones within 200 NM from the coast of a nation). By doing this they would have direct control on the fish stocks management in their waters, it would also hinder more developed countries to create social, economic and environmental problems by exploiting shared fish stocks.

3.The commercial fishing sector and the fishing industry behind it must be financially sustained by the state. The national fishing fleet must receive the right amount of subsidies in order to stay at pace with technological innovation, sustain the national economic growth and the fish industry. Moreover, the government must guarantee the competitiveness of the national resources in foreign markets.

4.The solution for the production of marine proteins is aquaculture that should be enhanced and supported by the governments. In this way the market will be completely independent by fisheries, thus removing also unsustainable practices and assuring better traceability and control of all phases of the production.

5.We need to protect our resources - which are already in a state of crisis due to the high fishing effort and low management measures we used to have because of overexploiting methods of fishing. If every country claims the EEZ, they may overexploit shared stocks. As a result, we will see our seas more empty and an uneven share of fish products cost.

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PROJECT PARTNERS Involved: Andrea Lanza, Giulia Massolino, Simone Libralato (LP-OGS), Tea Kuzmičić (PP8-SUNCE)

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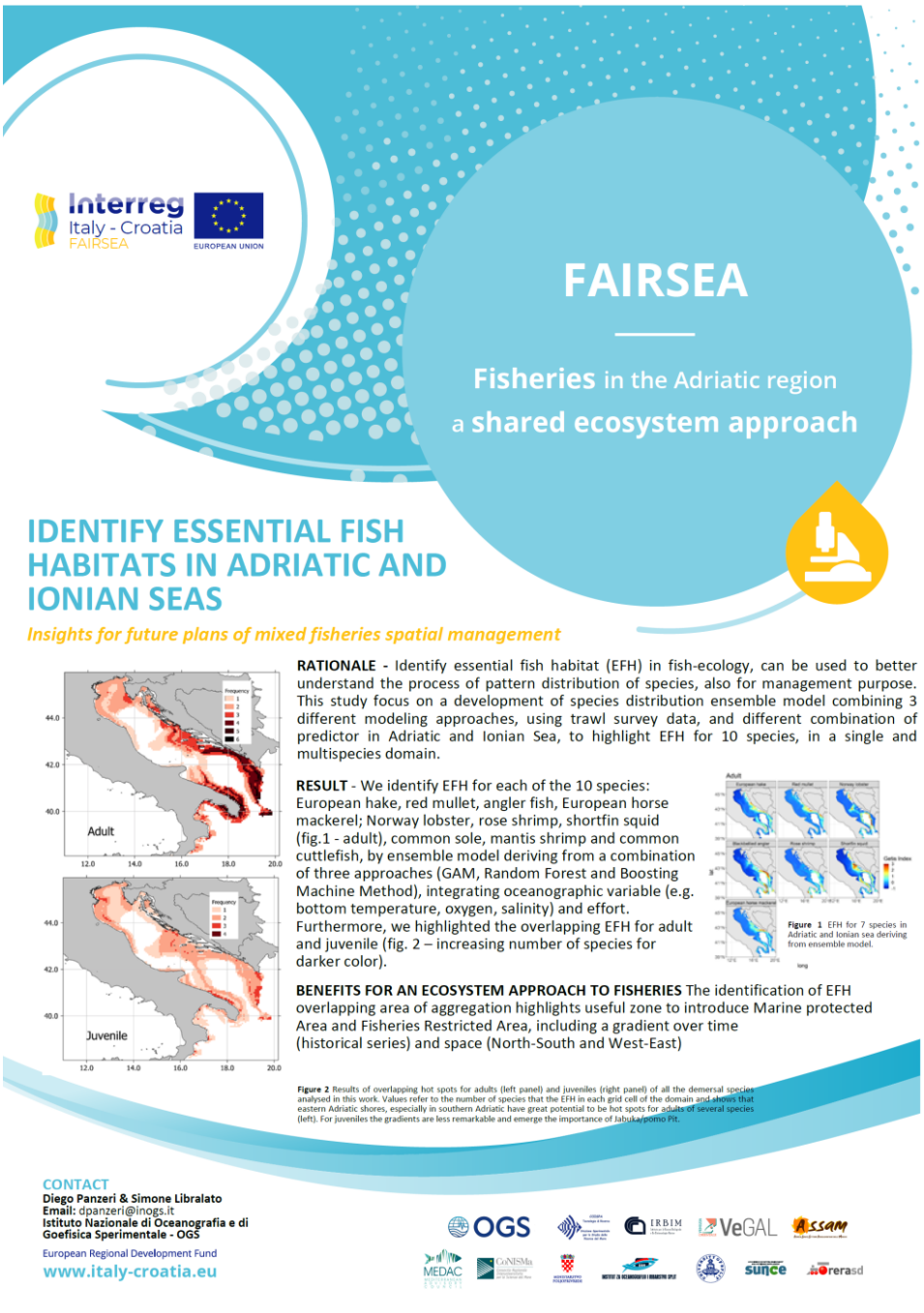
Factsheet 3 - The Fish n'Ships card game

Factsheet 4 - Identify Essential habitats in Adriatic and Ionian Seas



Factsheet 5- Second Advanced school on Ecosystem Approach to Fisheries