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Deliverable 1.2.1  
BlueDiversity State of the  
Art Report

**Activity 1.2 – State of the art specific  
issues analysis  
(Version 1.0 – February 2025)**

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## BlueDiversity

Shared BLUE knowledge and skills to sustain BIODIVERSITY in mariculture

### Project Details

<b>Project Acronym</b>	BlueDiversity
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<b>Activity 1.2</b>	State of the Art Specific Issues Analysis
<b>Deliverable 1.2.1</b>	BlueDiversity State of the Art Report
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## REVISION TABLE

Version	Name(s)	Date	Description
V 0.1	Sara Bergamin	February 2025	Description of the activities, methodology and data analysis
V 0.2	Marta Tasinazzo	February 2025	Peer-Review
V 1.0	Sara Bergamin, Marta Tasinazzo, Dario Dessanai, Davide Destro	February 2025	Deliverable submission

### DISCLAIMER NOTE

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## ABBREVIATIONS

### **List of Abbreviations:**

SoA: State of the Art

AF: Application Form

ES: Ecosystem Services

ESU: Ecosystem Services Users

NIS: Non-Indigenous Species

PP: Project Partners

LEK: Local Ecological Knowledge



## ABOUT THE **BlueDiversity** PROJECT

The **BlueDiversity** project is part of the Interreg Italy-Croatia 2021-2027 Programme, co-funded by the European Union. The **BlueDiversity** project's priority is priority 2 (Green and resilient shared environment). The Specific Objective is SO2.2: improve the protection and preservation of nature, biodiversity and green infrastructure, including in urban areas, and reduce all forms of pollution. In light of this, the **BlueDiversity** project aims at enhancing the ecosystem services-based practices, which allow the sustainment of local ecosystems' preservation through reducing human activities' impacts on biodiversity, while enhancing and developing economic and territorial opportunities.

To achieve the project's objectives, the Project Partners have the need to assess the State of the Art about the main biodiversity threats identified in the pilot areas, by analysing biodiversity, non-indigenous species, marine litter, and lagoon litter. The State of the Art analysis will also target, experiment and screen existing practices, innovations, resources available and attitudes of the ecosystem services end users in the context of the Adriatic Sea.

The Adriatic socio-eco-cultural features represent the common thread for the project actions, bringing relevant stakeholders of the blue economy and blue research to work together towards best and innovative practices with the common scope to develop a green and sustainable transition in the blue sector. In particular, the **BlueDiversity** project targets small and medium enterprises aiming to establish "living laboratories", providing institutional support on the one hand, and placing them as didactic examples at the much-needed interface with schools and younger generations, enhancing the framework of the blue economy with a multilateral approach that includes institutional actors and citizens.

The Adriatic Sea, shared by Italy and Croatia, represents one of the best examples of natural backgrounds in ecological terms, where the dynamics of co-creation, based on an intertwinement of tradition and innovation, can be established. The project aims to develop pilot activities that will experiment with innovative fishing gear to tackle the presence of non-indigenous species that seriously threaten the Adriatic coasts' aquatic ecosystems.

The **BlueDiversity** project is modular, aiming at fully replicable successful experiences, representing the actions' legacy and the core of a shift towards the blue economy. Such elements will be strategically disseminated targeting different institutional and non-institutional entities focusing on the capitalization of the knowledge, know-how and innovative instruments developed throughout the project and aimed at building a sound ground for future major innovative developments.



#### D 1.2.1 - EXECUTIVE SUMMARY

**D1.2.1 BlueDiversity State of the Art Report** describes the results of A1.2 *State of the art specific issues analysis* performed during implementation periods 1 and 2.

D1.2.1 includes the creation and validation of *Questionnaire 1.2 State of the Art: Specific Issues*, its submission to relevant Ecosystem Services Users in the 6 Pilot areas, targeting 90 responses.

BlueDiversity successfully reached the goal by collecting 122 filled surveys: D1.2.1 defines the methodology used to build the Questionnaire, briefly states data management practices and conveys the main results of the analysis of the input gathered.

#### D1.2.1 - LINKS WITH OTHER PROJECT ACTIVITIES

D1.2.1 is in line with other WP1 *"State of the Blue Art"* activities, it also feeds WP2 *"Blue Initiatives"*, WP3 *"Blue Education, Training and Culture"* and WP4 *"Blue Capitalization"*.

D1.2.1 builds on the knowledge collected in A1.1 *"State of the Art Context Analysis"*; the results of the data collected via the *Questionnaire 1.2 State of the Art: Specific Issues* are significantly relevant for A1.3 *"Target Definition"*, D1.3.1 and O1.1 delivering *"White Paper to BlueDiversity"*.

D1.2.1 offers an overview of the presence and the perception of Blue Crab in the specific pilot areas, investigating also the availability of surveyed Ecosystem Services Users to taste or purchase the alien species, contributing to WP2.

D1.2.1 brings a data-based assessment of the level of knowledge and the perception of the specific topics tackled by BlueDiversity, paving the way for the construction of the educational paths in WP3.

D1.2.1 contributes to the policy recommendations foreseen in WP4, as opinions regarding legislation and rules aimed at protecting and safeguarding the ecosystem are investigated.



**SUMMARY**

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## 1. DELIVERABLE 1.2.1 - INTRODUCTION

### 1.1. DELIVERABLE OVERVIEW

Deliverable 1.2.1 BlueDiversity State of the Art Report is the results of Activity 1.2 State of the art specific issues analysis. As described in Application Form, BlueDiversity builds **Questionnaire 1.2 State of the Art: Specific Issues to collect data directly from the relevant ESU (Ecosystem Services Users) in the Pilot areas to determine the perception of the topic tackled by the project**, namely, **ecosystem services, biodiversity, NIS Non-Indigenous Species and Marine Litter**.

**BlueDiversity identifies the following 6 Pilot areas:**

- Aquatina di Frigole and Ionian Sea mariculture Pilot Area (**Puglia, Italy** – Lead Partner University of Salento)
- Cetina river and estuary + Pantan Coastal Lagoon (**Split, Croatia** – PP2 Sea and Krast)
- Neretva delta (**Split, Croatia** – PP4 Institute of Oceanography and Fisheries) IZOR BOZANIC
- Mali Ston Bay (**Split, Croatia** – PP5 Public Institution for the Management of Protected Natural Areas) Laura Kljuce
- Coastal area between the Port of San Benedetto del Tronto and the Sentina Natural Reserve (**Marche, Italy** – PP6 BLU MARINE SERVICE)
- Venice Lagoon (**Veneto, Italy** – PP7 University of Padova)

BlueDiversity investigates 3 pilot areas per each participating Country, as the 3 Italian pilot areas are distributed along the entire coast of the country, the 3 Pilot areas in Croatia are around the city of Split, in a small geographic area within 35 km, having the mutual characteristic of continuous freshwater inflow.

Data are therefore gathered to discriminate geographical context and location, gender and level of education to assess literacy regarding the specific issues listed above, while testing opinions also regarding Blue Crab and policies.

#### 1.1.1. OBJECTIVES

D.1.2.1 BlueDiversity State of the Art Report is the results of Activity 1.2 State of the art specific issues analysis, in particular the task revolves around the creation, translation into the two national languages, diffusion, compilation and analysis of the Questionnaire 1.2 State of the Art of Specific Issues. **The target is the collection of 15 Questionnaires per each Pilot area, 45 per each Partner Country, totaling 90, to determine the level of knowledge of the local actors**



**regarding the problems tackled by the project: Ecosystem Services, biodiversity, NIS Non Indigenous Species (with focus on Blue Crab) and Marine Litter, as well as policies.**

In addition, the perception of the respondents is tested, targeting especially those actors that are directly exploiting the Ecosystem Services in the pilot areas (ESU), both for economic and recreational purposes.

## 1.2. CONTEXT

BlueDiversity Activity 1.2 investigates the state of the art of specific issues, namely the topics targeted by the project: Ecosystem Services, biodiversity, Non-Indigenous Species (NIS, with focus on Blue Crab) and Marine Litter.

**A set of questions is specifically dedicated to the Blue Crab** to establish not only the perception of the Ecosystem Service users (ESU) but also to gather valuable inputs to orient the implementation of upcoming project activities specifically dedicated to this NIS.

Policy-related information is also collected to capture the general opinion regarding laws ruling the protection of the ecosystem and the local biodiversity.

Questionnaire 1.2 needs to be easily accessible to a variety of different interviewees, reflecting the ample range of ESU, from the University Researcher studying NIS to the local recreational fisherman.



## 2. QUESTIONNAIRE

### 2.1. METHODOLOGY

*Questionnaire 1.2 State of the Art: Specific Issues* has the objective to **assess the perception of the ecosystem services users** (ESU) regarding the topic tackled by BlueDiversity. **A multifaceted target is selected**, therefore the survey needs to be accessible to respondents with very different backgrounds and educational level, for example: PhD researchers studying the Blue Crab, single fishermen and tourists.

The digital version made using Google Moduli is available at the link <https://forms.gle/LcU1JY8HFhoGxQwm7>, as well as via QR code.



**The Questionnaire structure, composed of closed end questions, reflects the need to collect information in a direct manner, accommodating for an heterogeneous plethora of possible interviewees.**

To ensure accessibility, the Questionnaire is translated into the 2 national languages of the programme countries, an English version is additionally available. The Questionnaire can also be filled out online via Google Moduli, also available in ENG, ITA, HR.

**The data collected through the Survey determine if the issues identified by BlueDiversity are relevant for the ESU, their perception and differences among pilot areas.**

The analysis also investigates the type of ESU, collecting information from professional and recreational subjects.

Moreover, the questionnaire measures separately the impact for each of the BlueDiversity issues, collecting data from a purely environmental standpoint in addition to the economic side.

Ultimately, inputs regarding the policy aspects are collected mainly to understand the opinion of respondents while assessing their attitude and sentiment, determining what is deemed as a priority for a successful protection of the local biodiversity and for effective management of ecosystem services.



Notably, a cluster of questions is dedicated specifically to the Blue Crab to investigate the propension toward commercialization and use as food: the preliminary information here collected are essential for the future development and activities of the BlueDiversity project to shape an evidence-based structure of the dedicated deliverables and outputs.

*Questionnaire 1.2 State of the Art: Specific Issues* purposefully exploit the Local Ecological Knowledge (LEK) of interviewees, recognizing LEK as an alternative source of information to register the presence of species, the quality of the habitat, the amount of species and their abundance (Rasalato et al. 2010), as well as the shift in the population and biodiversity. Local Ecological Knowledge (LEK) is defined as the heritage information detained by a specific group of people regarding the local ecosystems they inhabit or use for work, as the ESU interviewed by BlueDiversity partners in the 6 Pilot areas.

The Questionnaire 1.2 in its entirety is reported in Annex I in English, Annex II in Italian, Annex III in Croatian. The Survey presents different sections or cluster of questions:

- General information
- Definition
- Marine Litter
- NIS Non-Indigenous Species
- Blue Crab
- Policy

### **General Information**

The section collects informative and context data, as follows:

- Date,
- Location,
- Gender - the respondent can select between Male, Female and Other,
- Level of education - it is possible to choose one of the following:
  - Primary Education (Elementary school)
  - Middle School
  - High School Diploma
  - Bachelor's degree
  - Master's degree
  - PhD
- Type of interviewee - to define if the respondent acts as a single or on behalf of a legal entity:



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- Individual
  - Company
  - Association
  - Public Authority
  - Other
- Sector - if the interviewee represents a legal entity, a sector of activity can be selected between:
    - Individual citizen
    - Fish-related (Fisheries, aquaculture)
    - Tourism (Hospitality and excursions)
    - Food services (restaurants, bar, etc)
    - Civil Society
    - Public Authority
    - Other

### Definition

This part of the Questionnaire contains the comprehensive list of topics tackled by BlueDiversity project to delineate the level of knowledge of the respondents through a set of closed-end queries (with allowed answer Yes or No):

- Ecosystem Services – Do you know the term and its meaning? Yes/No
- Marine Litter – Do you know the term and its meaning? Yes/No
- Non-Indigenous Species – Do you know the term and its meaning? Yes/No
- Biodiversity – Do you know the term and its meaning? Yes/No

The terms are then described as follows:

Ecosystem Services: direct and indirect benefits that ecosystems provide humans, such as: provision of food, water and nutrients, climate regulation and culture/recreation.

Marine Litter: manufactured or processed solid material that is discarded, disposed of or abandoned in marine and coastal environments.

NIS Non-Indigenous Species: Species that have been introduced accidentally or deliberately in areas outside their natural range.

Biodiversity: the variety of all living things and their interactions that exist in a particular area.

### Marine Litter



The segment focuses on Marine Litter and gathers the following data:

- What is your relationship with the marine/lagoon ecosystem services?
  - Professional
  - Recreational
- Have you encountered Marine Litter?
  - Frequently
  - Rarely
  - No
- How do you perceive Marine Litter in relation to the local ecosystem and biodiversity?
  - Marine Litter is a dangerous threat
  - Marine Litter poses mild risks
  - Marine Litter is not a problem
- Do you think that Marine Litter has a negative impact on the local economic activities and ecosystem services?
  - Yes
  - No

### **Non-Indigenous Species**

The section investigates NIS and collects inputs from the surveyed ESU, in line with LEK:

- Have you encountered Non-Indigenous Species?
  - Yes
  - No
  - If yes, please list them \_\_\_\_\_
- If encountered, how would you describe your encounter with NIS Non-Indigenous Species?
  - Positive
  - Negative
  - N/A
- How do you perceive Non-Indigenous Species NIS in relation to the local ecosystem and biodiversity?
  - NIS are a dangerous threat
  - NIS poses mild risks



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- NIS are not a problem
- In relation to the local economic activities and ecosystem services, how do you perceive the impact of Non-Indigenous Species NIS?
  - Positive impact
  - Neutral impact
  - Negative impact
- In the last 2 years have you noticed a change in the local biodiversity?
  - Yes
  - No
  - If yes, please explain which species
- How do you assess the general health of the local ecosystem and biodiversity?
  - Positively
  - Neutral
  - Negatively

### Blue Crab

This part of the Survey collects the following data to assess the presence, the perception and the opinions regarding a specific alien species, namely the Blue Crab:

- Are you aware of the Blue Crab? Yes or No
- Have you encountered the Blue Crab?
  - Frequently
  - Rarely
  - No
- What is your perception of the Blue Crab?
  - Positive: it can be an interesting economic opportunity
  - Neutral
  - Negative: it is degrading local biodiversity
- If available at a local restaurant, would you consider trying the Blue Crab? Yes or No
- If commercially available, would you consider buying the Blue Crab? Yes or No

### Policy



The section generates data regarding the perception of policies, as well as the role of education:

- Are you aware of the policies, regulations and laws ruling the protection and safeguarding of the local ecosystem and its biodiversity? Yes or No
- What is your perception of the policies, regulations and laws aiming at protecting and safeguarding the local ecosystem and its biodiversity?
  - Positive
  - Neutral
  - Negative
- Do you envisage a more attentive management of the local ecosystem? Yes or No
- Do you think that a stricter policy action is needed to preserve local biodiversity and local ecosystem? Yes or No
- In principle, would you prefer a public or a private management of the local ecosystem (including access to ecosystem services)?
  - Public
  - Private
- Do you think that targeted education and awareness raising can have a beneficial impact in preserving the local ecosystem and its biodiversity? Yes or No

## 2.2. OBJECTIVES

**A baseline of the level of knowledge of the specific issues treated by BlueDiversity is established by assessing the awareness of the terminology.**

Notably, the definition of perception is a tricky assignment: on one hand it is possible that respondents have faced directly one of the issues investigated but are not aware of an existing definition, while often people form opinions without having a clear overview and understanding of the problem and a lack of first-hand experience.

For what concerns the types of users of the Ecosystem services (ES) in the pilot areas, *Questionnaire 1.2 State of the Art: Specific Issues* lays a division between recreational and economic actors.

The economic implications are assessed within the diverse user base, as well as policy perspectives and input for future strategies.

The questionnaire has the objective of establishing a baseline while gathering an overview of the perception, thus the methodology exploited to build the questionnaire serves the cited scope: the close-end questions and the guided approach are also helpful considering the heterogeneity of the



targeted respondents; a detail-oriented approach and open-end questions are de-facto ineffective under BlueDiversity *Questionnaire 1.2 State of the Art: Specific Issues* assumptions.

The aim of *Questionnaire 1.2 State of the Art: Specific Issues* is to collect the point of view of different types of ESU in diverse Pilot areas, while discovering if discrepancies stand.

### 2.3. DISTRIBUTION AND DATA TREATMENT

Each BlueDiversity partner participates in the distribution of *Questionnaire 1.2 State of the Art: Specific Issues* to important actors in the Pilot area, exploiting email, QRcode and in-person contact.

Each partner prepares a list of relevant actors to be contacted, via email, phone or directly.

The questionnaire does not collect any personal information, respondents are anonymous and no relevant personal data is collected. The aim of the activity is to test the perception of the ecosystem service users regarding the specific issues tackled by the project, thus no personal data is required, since it is not relevant for the scope of BlueDiversity.

The questionnaires, both collected in handwriting and online, do not report any sensitive information: it is not possible to link any specific survey to an individual or an organization.

To complete the survey, even using the online option, contact information are not requested: BlueDiversity invites respondents to get in touch with the project by listing its email addresses, webpage, and social media accounts.

Nothing that no specific personal/organization data is gathered, the information collected is treated in line with GDPR: responses are used only for the purposes of BlueDiversity activity 1.2 and are not shared with third parties. Only upon request, copies of the filled questionnaires are shared with the financing authority, always maintaining the anonymity of the interviewees.

Respondents are aware of the data treatment as it is clearly stated at the very beginning of the Survey: it is purposefully explained that by completing the Questionnaires, interviewees agree with the BlueDiversity data protection plan, complying fully with GDPR.

Respondents are made aware of data collection purposes and treatment through the following initial statement, acknowledging the completion of the Questionnaire as agreement to the terms:

***Disclaimer: Data collection and data usage***

*BlueDiversity operates in full compliance of the GDPR: data gathered through this Questionnaire will be used for the sole objective of BlueDiversity project: the information hereby collected will be aggregated and analyzed for the internal scopes of the project. Raw data will only be shared within Consortium members and with the Managing Authority, only upon request. No external third parties will have access to the collected data and no commercial use is permitted. The resulting aggregated information may be*





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*shared for communication and dissemination of BlueDiversity activities and results: single interviewee data will not be displayed.*



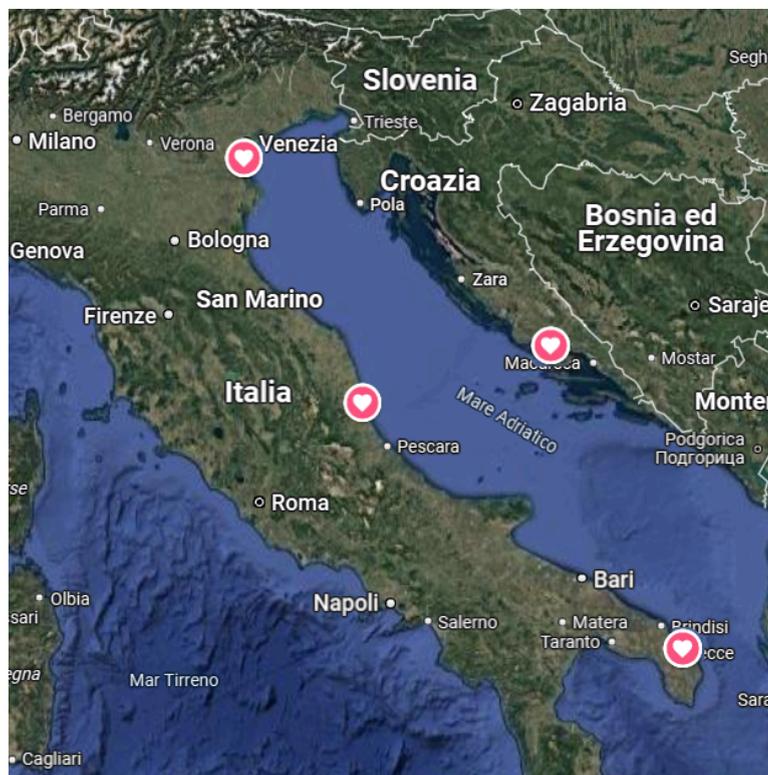
## 3. DATA ANALYSIS

### 3.1. DATA COLLECTED

BlueDiversity *Questionnaire 1.2 State of the Art: Specific Issues* objective is to collect 90 Surveys (15 per pilot area - 45 per each State): **a total number of 122 have been gathered, 95 online and 27 hand-written**. The target was achieved and surpassed, with 50 answers collected by the Croatian partners and 72 by the Italian.

### 3.2. RESULTS PER AREA

BlueDiversity has 6 Pilot areas: 3 Italian locations are scattered along the coasts and 3 Croatian spots are all positioned in the Split area. The data collected through *Questionnaire 1.2 State of the Art: Specific Issues* are here presented distinguishing between the Apulia South Italy pilot area (LP Aquatina di Frigole and Ionian Sea Mariculture), central Italy pilot area in Marche region (PP6 Coastal area between the Port of San Benedetto del Tronto and the Sentina Natural Reserve), north Italy pilot area in Veneto (PP7 and PP3 Venice Lagoon) and the Croatian aggregated data covering the 30 km coastline in Split (PP2, PP4 and PP5) encompassing the three pilot areas of Cetina river and estuary, Pantan Coastal Lagoon, Neretva delta and Mali Stone Bay.



**South Italy - Apulia: Aquatina di Frigole and Ionian Sea mariculture**

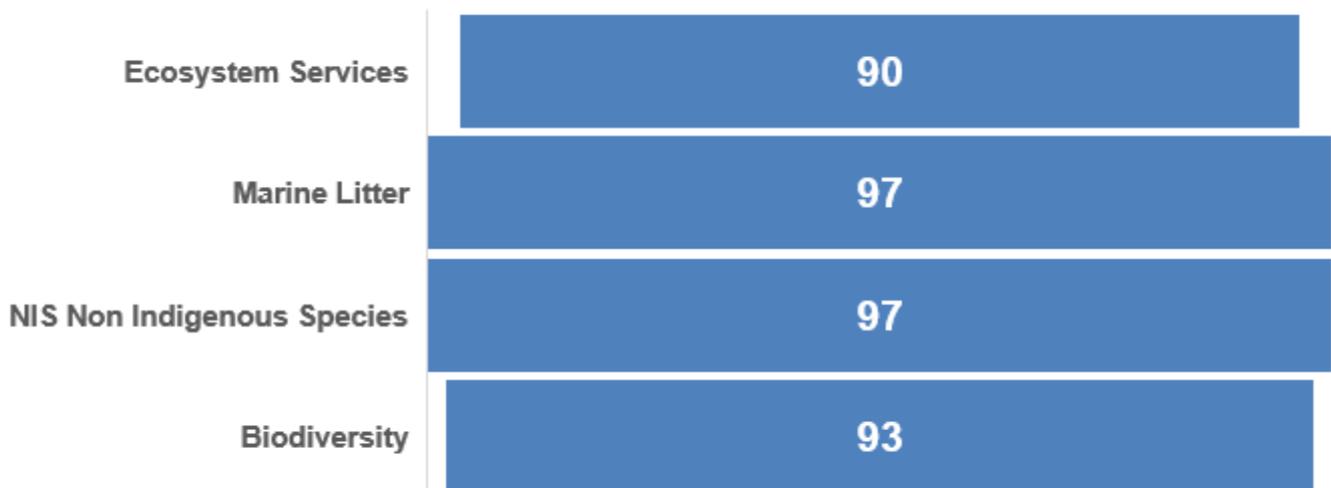
BlueDiversity LP manage to collect 32 Surveys, the gender is well-balanced (Male 47% and Female 53%) while the level of education is herewith distributed: High School Diploma 13%, Bachelor’s degree 3%, Master’s degree 56%, PhD 28%.

Most of the interviewees act as a single individual 87.5%, 3% company, 3% public authority (and 6% other).

50% of the subjects are citizens, 13% work in the fish-related industries, 9% are public authority, 25% belong to another sector and 3% bring the point of view of tourism-related entities.

Regarding BlueDiversity topics, most of the respondents comprehend the terminology: **90% are familiar with ecosystem services, 97% recognize Marine Litter and NIS while 93% are aware of Biodiversity.**

**% of Awareness of BlueDiversity Topics in Puglia Pilot Area**



**34% of interviewees exploit the ecosystem service for recreational reasons, while 66% make professional use.**

**87% frequently encounter Marine Litter** (13% rarely), 94% consider it as a dangerous threat and **100% think it has a negative impact on the local economy and ecosystem services.**

**75% of surveyed ESU encountered NIS** (35% no), **81% have a negative perception**, the alien species reported are: Blue Crab, *Silurus glanis*, sponges, bryozoans, ascidians, crabs, *Callinectes sapidus*, Algae, tiger mosquito, *Xylella*, red weevil, *Percnon gibbesi*, Rabbit Fish, Flute Fish, Parrot Fish, *Pomatomus saltatrix*, Alophila at cesarean section, Wolves and foxes.



**69% of subjects describe NIS as a dangerous threat** (31% as a mild risk), **75% identify a negative impact on the ecosystem services and the local activities** (22% neutral and 3% positive).

Interviewees are evenly divided as 50% have noticed a change in the local biodiversity, such as: invasive species (bighead carp) are depleting natural stocks through resource out-competition, increase in non-indigenous species, Blue Crab, decrease in sea bream and sea bass, presence of *Posidonia oceanica* and decrease of sea urchin, desiccation of olive trees, fewer jellyfish disappearance or decrease in the presence of the sea urchin. Accordingly, the general health of the marine ecosystem is considered in a neutral manner by 50%, positively for 13% and negatively for 37%.

**94% of interviewees are aware of the Blue Crab even if 25% never experienced it, 53% encounter the alien species frequently** and 22% rarely. **The perception is negative for 72%**, neutral for 12% and positive for 16%; on the contrary **72% are prone to taste the Blue Crab** but only 47% lean toward a commercial purchase.

**72% of respondents are familiar with regulation and laws aiming at protecting biodiversity**, 9% have a negative perception of policies, 28% neutral and **63% have a positive consideration**.

**94% envisage more attentive management of the local ecosystem, 100% suggest stricter policy action**, with 78% preferring a public management of the ecosystem and its services. **100% support the beneficial role of education and awareness raising** for safeguarding and protection of biodiversity.

### Central Italy - Marche: San Benedetto del Tronto and Sentina Natural Reserve

23 Questionnaires are collected in handwriting by PP6 in San Benedetto del Tronto and Sentina Natural Reserve area.

Gender is balanced among the 23 subjects, 10 are female (44%) and 13 are male (56%); the level of education is hereby distributed: Middle School Diploma 9%, High School Diploma 30%, Bachelor's degree 26%, 5 Master's degree 22%, 3 PhD 13%.

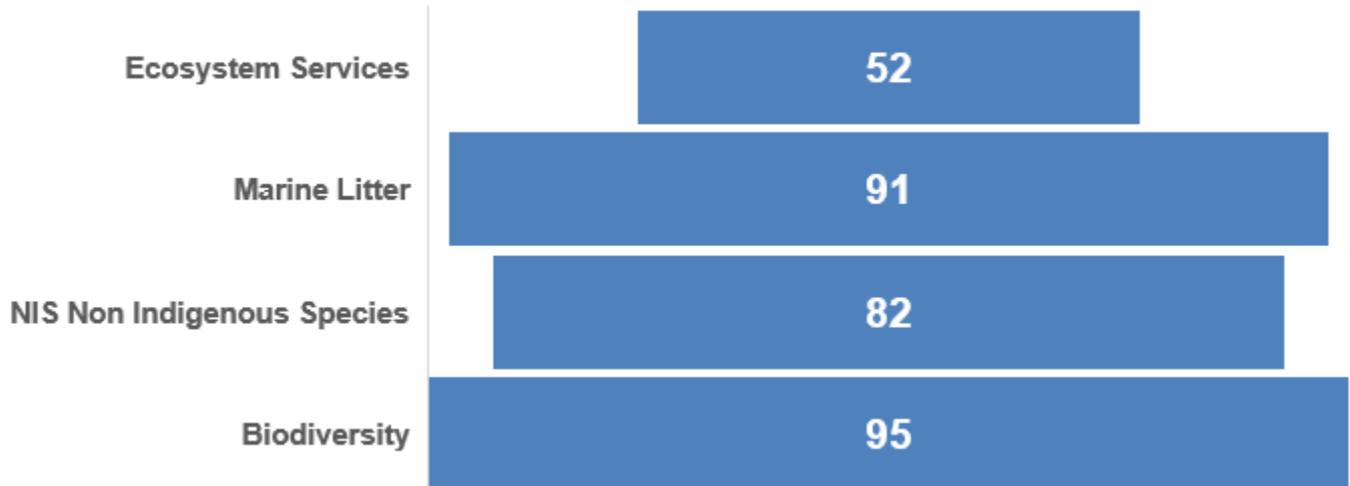
35% answer as individuals, company 30%, association 26%, Public Authority 4%, and Others (4%).

Interviewees belong to the following sectors: Individual citizen 26%, Fish-related 35%, Civil Society 22%, Public Authority 4% and Other 13%.

In the Marche area, a compelling majority of respondents declare to know the topics investigated by BlueDiversity: **91% recognize the term Marine Litter, 82% NIS and 95% Biodiversity, Ecosystem Services represent the exception with almost half (52%) not understanding its meaning.**



### % of Awareness of BlueDiversity Topics in Marche Pilot Area



Exactly **half of the respondents have a professional link with the marine ecosystem**, while half enjoy the recreational side.

**Marine Litter is experienced by 96% of the interviewees:** frequently encountered by most (83%) and rarely by 13% (only one declares no contact 4%); **95% have a negative opinion: 78% consider Marine Litter as a dangerous threat, 17% links Marine Litter with mild risks** and only one (4%) does not see Marine Litter as a problem; **generally, for 95% of ESU Marine Litter has a negative impact on the local economy and on ecosystem services.**

In San Benedetto del Tronto and Sentina Natural Reserve area **almost half of the respondents encountered NIS 47%** (53% no), 9 engaged with the Blue Crab in addition to *Callinectes sapidus*, *Trachemys scripta*, and *Caulerpa taxifolia*.

**94% of interviewees described the encounter with alien species as negative, 87% consider NIS as a dangerous threat** while 13% as a mild risk. **83% link NIS with a negative impact** while 17% see them as a neutral factor.

**74% of subjects note a change in the local biodiversity**, such as Mussel die-off in summer, reduction in clams, overexploitation of species accompanied by price increase, diminishing volumes for artisanal and low-quantity fishing, presence of blue crab and bluefish, increase in pollution and litter, mucilage, extremely high temperature, diminishing of commercial species (cuttlefish, octopus), increasing presence of shrimps, presence of a red Beetle, increasing presence of plastics also on the beach.

**40% of the respondents see the health of the local ecosystem in a neutral manner, 40% consider it diminished and 20% have a positive opinion.**



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**91% of interviewees acknowledge Blue Crab, even though 52% never encountered it, 43% have rarely seen it and 4% frequently.**

**87% of interviewees have a negative perception of the Blue Crab but 96% are available to taste it at a local restaurant and 91% are inclined to buy it if commercially available.**

65% are aware of the environmental laws, 56% consider regulation as neutral (21% negatively and 21% positively) **100% of interviewees suggest more attentive management and a stricter policy action, 65% of ESU envisage a public management for the local ecosystem and its services.**

For 91% of respondents dedicated communication campaigns and awareness raising can be beneficial for safeguarding the local ecosystem and its biodiversity.

### North Italy - Veneto: Venice Lagoon

17 Questionnaires are gathered by PP3 and PP7, 4 in handwriting and 13 through the online Survey: 35% of the respondents are female, while 65% are male; the educational background is thus distributed: Middle School Diploma 12%, High School Diploma 17%, Bachelor's degree 6%, Master's degree 41%, PhD 23%.

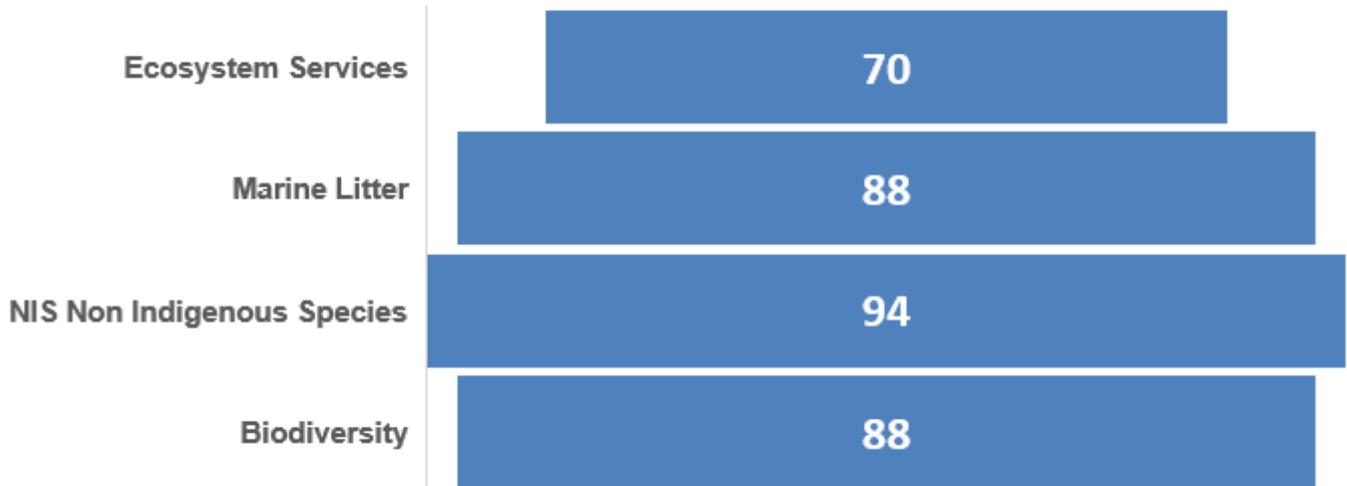
35% of subjects are individual citizens, 41% represent public authorities, 12% act as companies, the remaining 12% is divided between association and other (6% each).

Interviewees belong to the following sectors: Individual citizen 12%, Fish-related 6%, Tourism 6%, Food services 6%, Civil Society 6%, Public Authority 41% and Other 23%.

**Most of the respondents are familiar with BlueDiversity terminology: 88% know about Marine Litter and Biodiversity, 94% recognize NIS and 70% are conscious of Ecosystem Services and its meaning.**



### % of Awareness of BlueDiversity Topics in Veneto Pilot Area



**65% of subjects have a professional relationship** with the Lagoon ecosystem (35% recreational), **94% encounter Marine Litter frequently** (6% rarely), 82% consider it as a **dangerous threat**, while **100% recognize a negative impact on local economy and ecosystem services**.

**82% of the interviewees encounter NIS**, such as Blue Crab, Sea Bream (released 20 years ago), Philippine Clams (released 30 years ago), Special Algae, Jellyfish, sea walnut, *Callinectes sapidus*, Clams, Nutria, Louisiana shrimp, *Mnemiopsis leidyi*, Ibis, Blue Crab, *Baccharis halimifolia*, Sacred Ibis, Catfish, Japanese Algae (*Sargassum*), *Callinectes sapidus*, *Mnemiopsis leidyi*, *Callinectes sapidus*, Blue crab, urchins.

**90% of surveyed ESU describe their encounter with NIS as detrimental, denoting NIS as negative for the local ecosystem and biodiversity**; in fact, 94% believe NIS represent a dangerous threat and **have an unpleasant impact on both local economic activities and ecosystem services**.

77% of subjects report a change in the local biodiversity within the last 2 years, especially noting the detrimental effect of NIS on the fishing sector (product has decreased significantly and in cases disappeared), the presence of the Blue Crab, new kind of algae, lower diversity and abundance in benthic and planktonic communities, various species of bivalves and benthic invertebrates, greater presence of nutria and reduction of Louisiana shrimp, generally the marine fish resources in the Venice Lagoon and in the Po Delta lagoons are depleted.

Interviewees of the Venice Lagoon are **divided in thirds when considering the general health of the ecosystem** as 29% have a positive perception, 30.5% a neutral and 30.5% a negative.

**100% of the respondents are familiar with the Blue Crab**, 40% rarely engage with this alien species and **60% encounter the Blue Crab frequently**; **82% declare it as a detriment for the local biodiversity**.



Regarding the perception of Blue Crab for gastronomic purposes: 64% are available to taste it locally while 59% would buy it on the market.

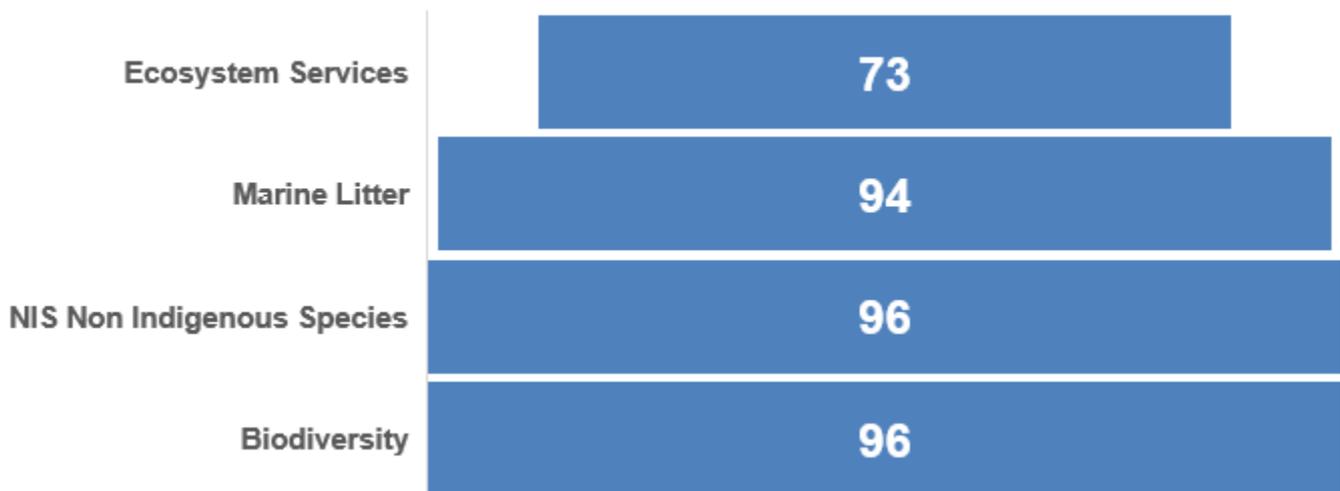
76% of the interviewees are aware of the rules and laws safeguarding the local ecosystem and its biodiversity, half have a neutral perception (47%), 29% positive and 23% negative. 100% of surveyed population envisage a more attentive management of the local ecosystem and a stricter policy action, under a public oversight (94%) and believe targeted education and awareness raising campaign have a beneficial impact in preserving local ecosystem and its biodiversity.

**Croatia: Split-Proximity Pilot Areas: Cetina river and estuary, Pantan Coastal Lagoon, Neretva delta and Mali Stone Bay**

BlueDiversity Croatian partners gather 50 Questionnaires, answers from male account for 44% and 54% female (other 2%). The level of education of subjects is hereby distributed: Middle School 32%, High School Diploma 10%, Bachelor’s degree 10%, Master’s degree 48%, PhD 10%.

Almost two thirds of interviewees are individuals (72%), 17% companies, 6% association, 6% other and 2% public authorities; 48% act as individuals, 22% represent Fish related industries, 8% tourism, 2% food services, 6% civil society, 4% public authority and 10% other. Respondents’ knowledge of the BlueDiversity topics is assessed as: **73% are familiar with the meaning of Ecosystem Services, 94% Marine Litter and 96% are aware of NIS and Biodiversity.**

**% of Awareness of BlueDiversity Topics in Croatia Pilot Areas**



64% of respondents have a recreational link with the marine environment, while 36% have a professional relationship; **86% frequently encounter Marine Litter** (14% rarely), thus **92%**



consider it as a dangerous threat (8% mild risk) and **98% envisage a negative impact on the local economy and ecosystem.**

**62% encounter NIS (38% no)**, such as Blue crab, fireworm, arrow fish, *Caulerpa*, *Siganus luridus*, puffer fish, peacock fish, fireworm, lionfish, moonlight jellyfish, *Caulerpa taxifolia*

**83% have a detrimental experience with NIS, 82% consider alien species as dangerous threats** (18% mild risk) while 74% connect NIS with negative impacts, 24% neutral and 2% positive.

58% of subjects notice a change in the local biodiversity, such as Blue crab, fireworm, arrow fish, *Caulerpa*, *Siganus luridus*, puffer fish, peacock fish, fireworm, lionfish, moonlight jellyfish, *Caulerpa taxifolia*, Sea urchins, *Haliotis*, species of algae and Blue Crab, reduced occurrence of autochthonous species, *Caulerpa taxifolia*, a negative impact of climate change on the entire ecosystem with extinction of some species and decrease in health, destruction of natural habitats, excessive poaching, loss in population of mussels, squid, octopus, sardines; increase in presence of jellyfish (more dangerous species) and algae (*Caulerpa*)

Half of interviewees (52%) consider neutrally the health of the local marine environment, 8% positively and 40% negatively.

**90% of respondents are aware of the Blue Crab even if half of them never entered in contact with the species (48%)**, 18% frequently and 34% rarely. **The perception is negative for 48%**, neutral for 36% and positive for 16%. **The availability to taste the Blue Crab at a restaurant is at 62%, while 56% are prone to purchase commercially.**

The knowledge of the regulations and laws safeguarding the local ecosystem is split (48% don't know and 52% are aware), half of respondents thus have a neutral opinion of the above mentioned policies while 24% consider them positively and 20% negatively.

A more attentive management of ecosystem and ecosystem services is suggested by 72%, 94% aim at stricter policies, 86% prefer public management and 98% see positively the effect of targeted education and awareness raising to maintain a healthier environment.

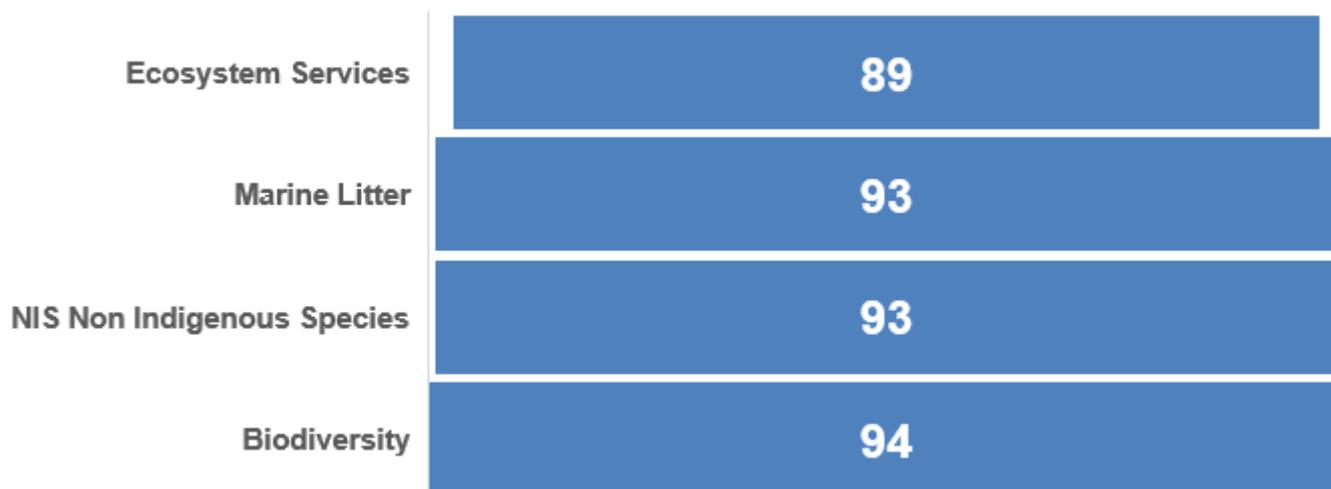
### 3.2. MAIN FINDINGS

#### Definitions

Overall, respondents are evenly split between professional and recreational users of the Pilot area environment and showcase a clear understanding of the topics tackled by BlueDiversity: **72% know the term ecosystem services and its meaning, 94% are familiar with Marine Litter, NIS and Biodiversity.**



### % of Awareness of BlueDiversity Topics



#### Marine Litter

**Only one of the 122 interviewees decline encountering Marine Litter**, the phenomenon is present in all six BlueDiversity pilot areas and **almost unanimity (99%)** is registered in relation to the **unfavorable perception of Marine Litter** and its negative impact on the local economic activities and ecosystem services.

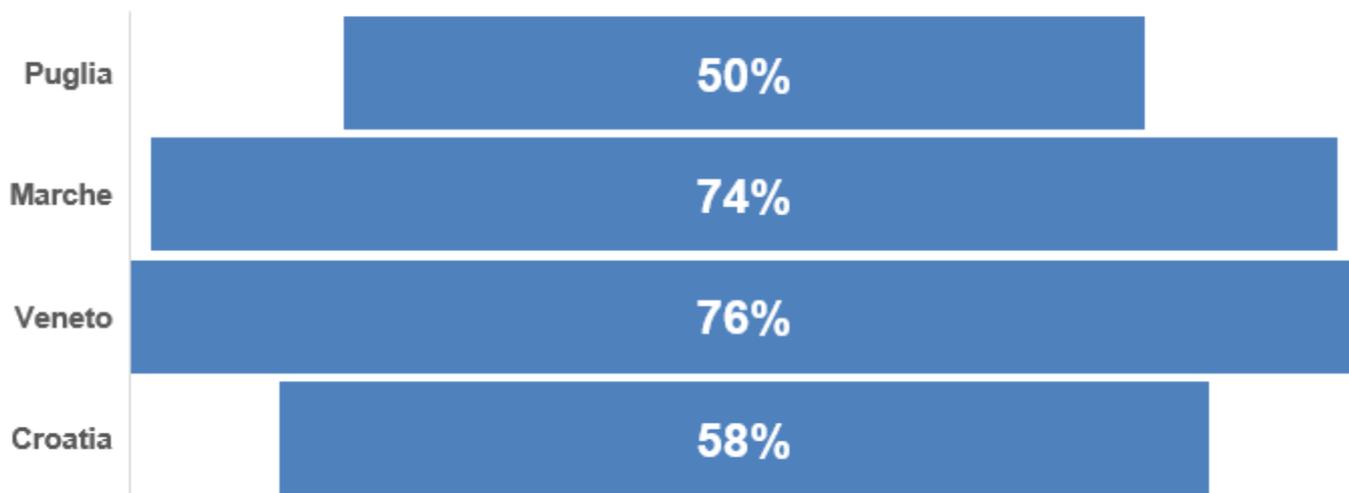
#### Non-Indigenous Species NIS

At project level, 65% of surveyed ESU have encountered NIS but **a significant majority (81%) hold an adverse perception** reckoning alien species as a **dangerous threat**, the remaining 19% identify NIS as a mild risk: no positive contemplation stands.

**Across the 6 Pilot areas, 61% of ESU note a change in the local biodiversity: 14% register the shift as positive, 38% negative** and 46% neutrally.



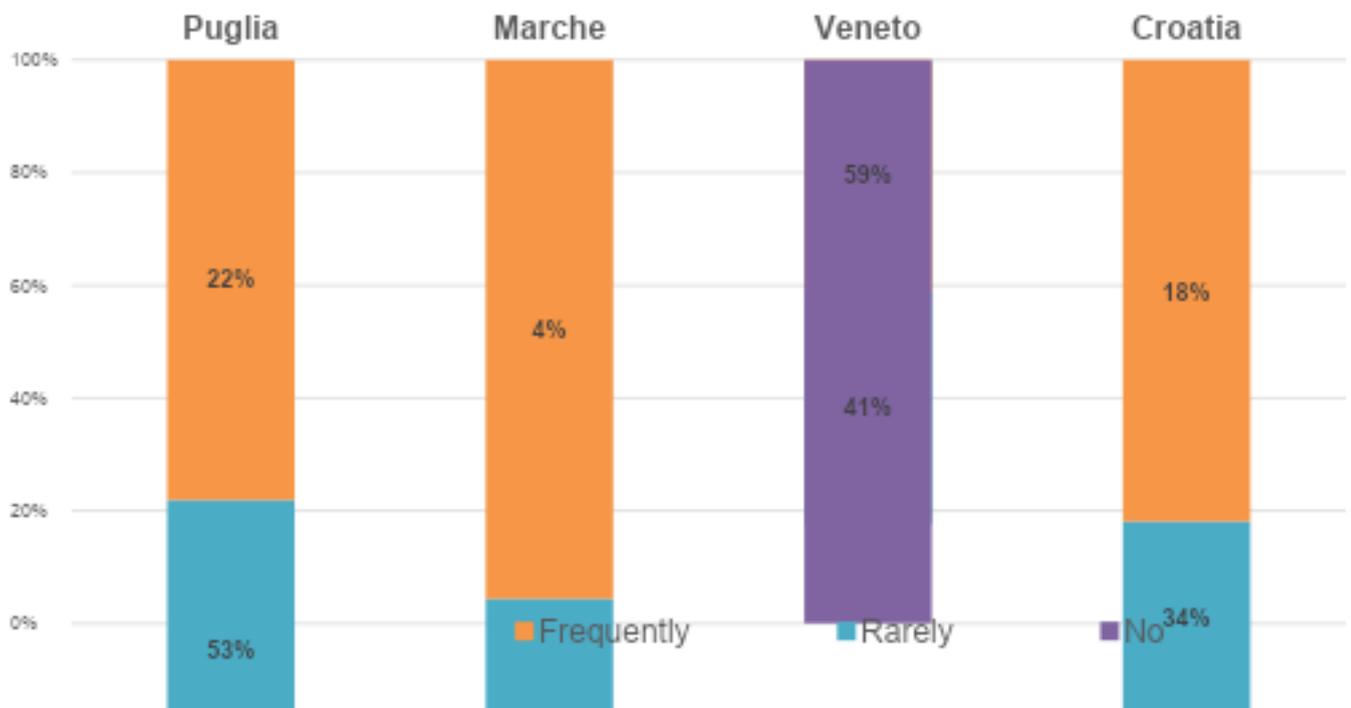
Change in the local Biodiversity observed in BlueDiversity Pilot areas



### Blue Crab

In all BlueDiversity sites the participants to Questionnaire 1.2 are **aware of the Blue Crab: 97%** have heard about it. In general, **frequent encounters happen for 22% of interviewees, 42% rarely and 36% register no direct contact.**

Encounter with Blue Crab in BlueDiversity Pilot Area



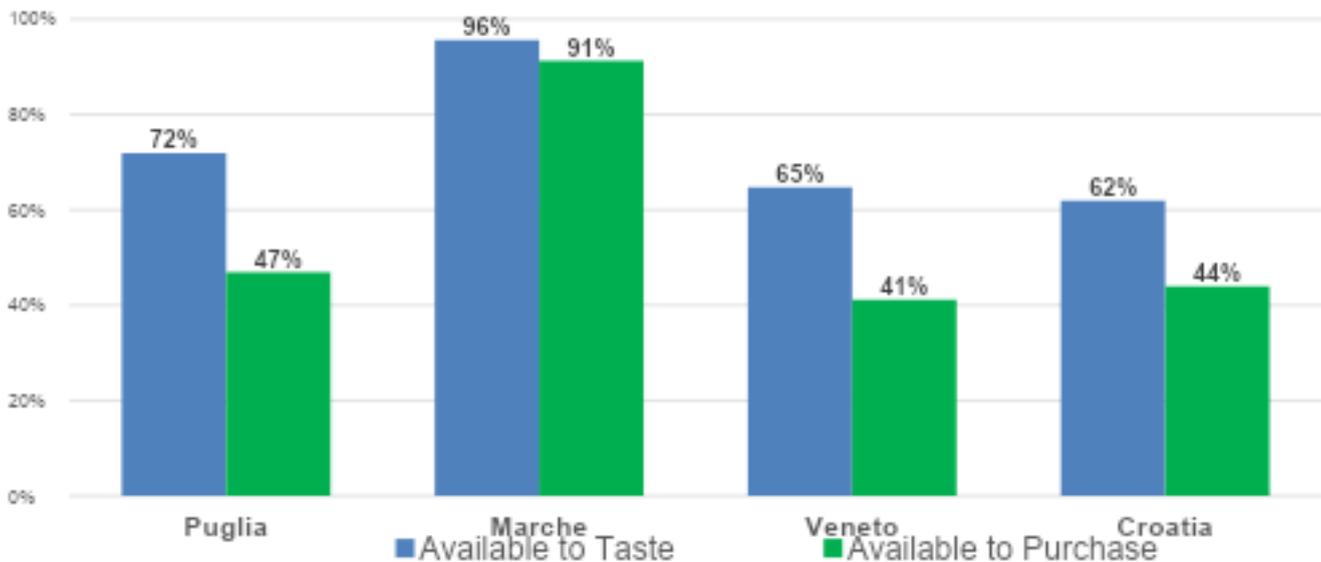
It is noteworthy to underline that the distribution of the Blue Crab is not uniform across the Pilot areas: in Venice Lagoon, located in the north Adriatic Sea, all respondents have encountered the Blue Crab; on the contrary, in central Italy Adriatic coast, in the Marche area, only one frequent spotting is reported.

The attitude toward Blue Crab is generally negative, with the acknowledgement as a degrading factor for the local biodiversity scoring 66%, neutral opinion is highlighted by 22% and the consideration of the Blue Crab as a positive opportunity at a mere 11%.



Accordingly, the availability of interviewees to taste this specific alien species at a local restaurant attest at 71%, while the option to buy commercially and cook first-hand the Blue Crab is feasible for half of the respondents (53%).

Attitude toward Blue Crab in BlueDiversity Pilot Areas



**Policy**

Respondents of *Questionnaire 1.2 State of the Art: Specific Issues* are mostly aware of the regulations and laws ruling the protection and safeguarding of the local ecosystem and its biodiversity (63%), 41% have a neutral perception of the policies, negative and positive impressions are evenly distributed at 25% and 27% respectively.

**86% of interviewees envisage more attentive management of the local ecosystem, 97% suggesting stricter policy action to protect the environment.** In principle, across BlueDiversity Pilot areas, respondents prefer a public oversight over ecosystem and ecosystem services (81%).

Finally, almost unanimity (97%) is reported over the need to dedicate communication campaigns and awareness raising to spread the importance of safeguarding the ecosystem and its biodiversity.



## 4. CONCLUSIONS

Among respondents of *Questionnaire 1.2 State of the Art: Specific Issues*, **the level of knowledge of BlueDiversity topics is satisfactory**, with more than 90% declaring to be aware of Marine Litter, NIS and Biodiversity; Ecosystem Services is the term with the lowest result at 73%.

**Marine Litter is present in all 6 Pilot Areas and is acknowledged negatively with almost unanimity by the surveyed ESU.**

An adverse perception is reported also for **NIS, described as a dangerous threat by 81%**, with the occurrence of encounters with alien species attested at 65%.

In line, 61% of interviewees highlight a change in the local biodiversity.

Concerning the **Blue Crab**, the **awareness rate** is significantly relevant: **97%** notify knowing about the species; **66% describe it as a peril for the local ecosystem and its biodiversity.**

Noteworthy, the majority of respondents state their availability to buy the Blue Crab if commercially distributed (53%) while more than 2/3 lean toward tasting it a local restaurant (71%).

**The distribution of the Blue crab is uneven among the Pilot Areas: data disclosing the encounter of the alien species follow this tendency with Venice Lagoon as the focal point for its reported presence.** On the contrary, only one ESU recounts frequent contact with the Blue Crab in the Marche Pilot Area.

ESU in BlueDiversity locations strongly sustain the need for **stricter policy actions to safeguard the ecosystem (97%) and envisage a more attentive management (86%) enacted by a public body (81%).**

*Questionnaire 1.2 State of the Art: Specific Issues* evidence a powerful preference of the local ecosystem users toward a public oversight of the environment and its resources, with a very limited amount of answers suggesting an inclination toward privatization of ecosystem services.

**97% of data collected support the role of education as a positive factor for ecosystem protection:** almost unanimity is recorded to ensure targeted communication and awareness raising campaign as beneficial action in valorizing the local biodiversity and related ecosystem services.



## 5. ANNEXES

Questionnaire 1.2 State of the Art of Specific Issues is developed in English, the common working language and translated in Croatian and Italian to facilitate participation and fruition in the pilot areas.

Section 5 of the current D1.2.1 report the documents as shared with the participants.

In addition, the Questionnaire is made available in a digital format through Google Moodle in the three languages.

Annex I BlueDiversity State of the Art Questionnaire in English

Annex II BlueDiversity State of the Art Questionnaire in Italian

Annex III BlueDiversity State of the Art Questionnaire in Croatian

Annex IV BlueDiversity State of the Art Questionnaire Online Google Module

