# RECONNECT

**Regional cooperation for the transnational ecosystem sustainable development**

**Interreg V-B "Balkan-Mediterranean 2014-2020"**

## Deliverable D5.X.2

# Training seminars for the citizen scientists prior to their involvement in the pilot project

**WP5: citizen science initiative - involving people in ecosystems restoration**

Responsible Partners: **Department of Biological Sciences, University of Cyprus**

Deliverable team: **DBS-UCY (& AP Marine Ltd)/ DFMR**

**June 2020**

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# 1. INTRODUCTION

## 1.1 Project RECONNECT:

The RECONNECT project (Regional cooperation for the transnational ecosystem sustainable development), is implemented under the framework of the transnational Cooperation Programme Interreg V-B Balkan Mediterranean 2014-2020, and is co-funded by the European Union and National Funds of the participating countries.

RECONNECT project aims to develop a transnational cooperative network for sustainable management of Marine Protected Areas (MPAs) and Natura 2000 sites. The new transnational and holistic approach, which will be developed, will change the current protection strategies in the Balkan-Mediterranean area, promoting more efficient and accurate management practices.

The main outputs of the RECONNECT project will provide information concerning habitat attributes, as well as the essential biodiversity, socio-economic and cultural variables of the participating countries.

The RECONNECT partnership consists of 9 beneficiaries: 6 ERDF partners, 1 IPA partner, and 2 ERDF observer partners. The partnership covers 4 Balkan-Mediterranean countries (Greece, Cyprus, Bulgaria, Albania), thus assuring wide transnational representation comprising the majority of the Balkan-Mediterranean 2014-2020 programme. The partnership includes universities (2) and research institutes (2), a national public authority (1) a non-governmental organization (1) and a public authority responsible for the management of a NATURA 2000 site (1). It also involves two observer partners from countries outside the Balkan-Med region, an Italian University and a research institute in France.

### 1.2 Deliverable's objective

The RECONNECT partnership aimed through deliverable D3.X.2 to organise training seminars for the citizen scientists who will voluntarily help to better protect the selected marine protected areas. These training seminars will be primarily focused on scuba-divers, who as described in D5.X.1, will be invited to dive in chosen diving spots where permanent quadrats were installed.

The divers will be instructed to follow the simple methodology developed under D5.X.1, and to enforce the suggested best diving practices. The Department of Biological Sciences of the University of Cyprus was responsible for implementing this deliverable, thus shared some guidelines in executing these training seminars with partners from MADPA, IBER-BAS, and FNS. Additionally, DBS-UCY shared relevant informative material, the training seminar's agenda and the power point presentations prepared specifically for promoting the best diving practices, and the citizen science methodology.

The general aim is to quickly instruct the interested divers on how to monitor the selected key habitats and species and to observe and report on significant distribution changes, record sightings of endemic and alien species, and anything else that they believe it's worth to be documented. For example, the citizen scientists might observe during their dives abandoned fishing gear (e.g. ghost nets) and they might want to report that, instead of photos of the permanent quadrats. They will be able to do so through the online platform https://cs-reconnect.hcmr.g designed by the lead partner.

### 1.3. About Citizens Science

Citizen Science is the public involvement in inquiry and discovery of new scientific knowledge. Citizen science reflects active citizenship, since citizens are involved in the collection of large quantities of data, regarding a number of different habitats, locations, even scientific goals, over a long period of time. According to Bonney *et al.* (2009), citizen science projects have been proved remarkably successful since citizen scientists provide an immense amount of data, regarding species occurrence and distribution, while being involved in projects all over the world. This has resulted in a remarkable advancement of scientific knowledge, and an active involvement towards the protection of environment.

Environmental monitoring using citizen science projects has increased worldwide over the past few years. These projects have been implemented in many ecosystems including marine and terrestrial environments. It not only serves the purpose of increasing knowledge and awareness about the environment, but it also increases the amount of information and data that can be collected when funding is limited. In other words, choosing a Citizen Science approach can be a cost-effective way of gathering a large amount of data, since the balance between the long-term cost of acquiring suitable data from scientists is greater than the cost of supporting volunteers to acquire these data (Pocock, et al., 2014).

The common features of citizen science practices are: (a) anyone can participate, (b) participants use the same protocol so data can be combined and be of high quality, (c) data can help scientists come to real conclusions, and (d) a wide community of scientists and volunteers work together and share data to which the public, as well as scientists, have access.

Citizen science enables participants to make a direct contribution to research, increase their scientific understanding, and immerse themselves deeply afield in learning about environmental issues. These opportunities provide personally transformative experiences. Some recent examples of the power of Citizen Science follow in the next paragraphs.

### 1.4 RECONNECT's citizen science protocol

The following guidelines mentioned in the advice paper of the League of European Research Universities (LERU), published in 2016, are the backbone of successfully executed citizen science projects. As mentioned in D3.X.1, these guidelines were considered important for the development of RECONNECT's methodology.

***Guideline 1: Recruitment and retention.***

When designing a citizen science project, researchers should plan for substantial and sustained investment in outreach and community management, to ensure adequate numbers and diversity in the citizen science community that will participate in the project. Also, as mentioned in the respective advice paper, successful identification of audiences also plays a vital role. Audiences can be identified and targeted through the internet and the media, tapping into existing groups or partner organizations, which appears particularly

effective. Targeting civic groups, neighborhood organizations and non-profit environmental protection groups can help amplify participation. Retention can create a core of participants with advanced levels of experience, providing local leadership and resulting in the collection of more reliable data.

***Guideline 2: Quality and impact.***

As mentioned in the LERU's advice paper, researchers planning citizen science projects should clearly define the impact they aim to have at the outset of the project, as well as regularly communicate with the participants to track their progress towards this impact, or deviations that may occur, through a broad range of indicators, from scientific publications to more popular forms of dissemination.

***Guideline 3: Learning and creativity.***

Where feasible, projects should be designed to encourage all participants fully to contribute their talents and creativity, to grow their skills and responsibilities within the project, and to increase their knowledge of the related science in a pedagogically sound way. Researchers should encourage creativity from volunteers for two reasons: Creativity appears to be an indicator of high engagement in the project; Creativity can lead to innovation and helping the project to operate better. Being part of a project community appears to be an important motivating factor for creativity to take place. It is through the community that creative individuals have an audience to share their ideas with and to receive validation for their efforts (Jennett, et al., 2016).

***Guideline 4: Openness and transparency.***

Researchers developing citizen science projects should adopt open science standards consistent with their institutional policies, including open access publication, open data standards, open source software, and extending to full transparency of the research methods.

***Guideline 5: Organization, communication and sustainability.***

Citizen science projects require appropriate organizational and oversight structures to represent the interests of all stakeholders, codes of conduct to ensure respectful

communication between all participants, and a long-term data preservation plan that enables open access to results and data, ideally sustainable beyond the end of the project.

***Guideline 6: Credit and reward.***

Citizen participation should be recognized properly, for example through acknowledgement or co-authorship in publications, where appropriate, through motivational rewards and through a credit system that enables tracking of contributions.

***Guideline 7: Ethical and legal considerations.***

Researchers should provide clear terms and conditions for participating citizen scientists consistent with both open science and personal privacy requirements. Where useful to the project, citizens may be involved in decision making aspects. Where appropriate, they should retain control over personal data they have shared, also beyond the end of the project.

### 1.5 The RECONNECT Citizen Science methodology

As was mentioned in the introduction, keeping things simple is vital for the successful implementation of the citizen science actions. For this reason, RECONNECT's methodology was built in a simple-to-follow basis. The citizen scientists will need to follow the 5 steps described below, and through this way they will be able to produce useful data, reported in a systematic way.

I. *Dive to the site*

   The participants will know about the pre-selected diving trails and will be suggested to look for the quadrats GPS coordinates in the citizen science platform (https://cs-reconnect.hcmr.gr/), which will have a map for each pilot site, and the locations of all the quadrats will be displayed. Through this way, the citizen scientists will be familiarized with the area of the pilot stations before the dives.

II. *Search for the quadrats*

   The citizen scientists will need to dive to the sites, and search for the quadrats. As was mentioned before, in the Cypriot study sites for example, the divers will need to look for 10 quadrats, in each of the three selected diving sites. The challenge will be to track and report all the quadrats.

*III. Take a photo*

The participants will be requested to take a photo of the quadrat. They will need to make sure that the quadrat's label will be in the picture and will need to double-check that it's in focus. Through this way they will be able to record the marine biodiversity which will be developed in the quadrats and report it back to the scientists.

*IV. Report what's important*

Apart from taking pictures of the quadrats, the citizen scientists will be able to report anything they think it's important mentioning. A pre-defined list with the most important species per study site will be offered as an option for additionally reporting. Also, a pre-defined list on threats and anthropogenic effects on the diving site such as marine litter, abandoned fishing gear (e.g. ghost nets), diver recklessness etc. will be included in the database in order to help the volunteers report back anything they believe it's worth mentioning. This will contribute to the overall management of the area. It will be emphasized to them that their contribution in this project would be the realization of the importance of acting. Each citizen has to take a level of responsibility and contribute in any possible way towards the overall protection of the marine environment. Each act, each initiative for reporting would be welcomed.

*V. Upload the photo*

After taking their pictures, the citizen scientists will be requested to upload them in the citizen science platform (https://cs-reconnect.hcmr.gr/) which was built for serving this purpose. They will be able to upload each quadrat in each study site separately and thus easily see their success in finding all the requested quadrats. It will be the main media of reporting and a way of communication between the participants and the organizers.

### 1.6 Citizen Science online platform

An online platform for the citizen science initiative was created in deliverable D5.X.3 from HCMR team (Image 1). The citizen scientists which participated in the project, were instructed to upload their pictures and submit their reports through this online platform (https://cs-reconnect.hcmr.gr) used for the aforementioned actions.


**Image 1:** Part of the main page of RECONNECT's citizen science platform.

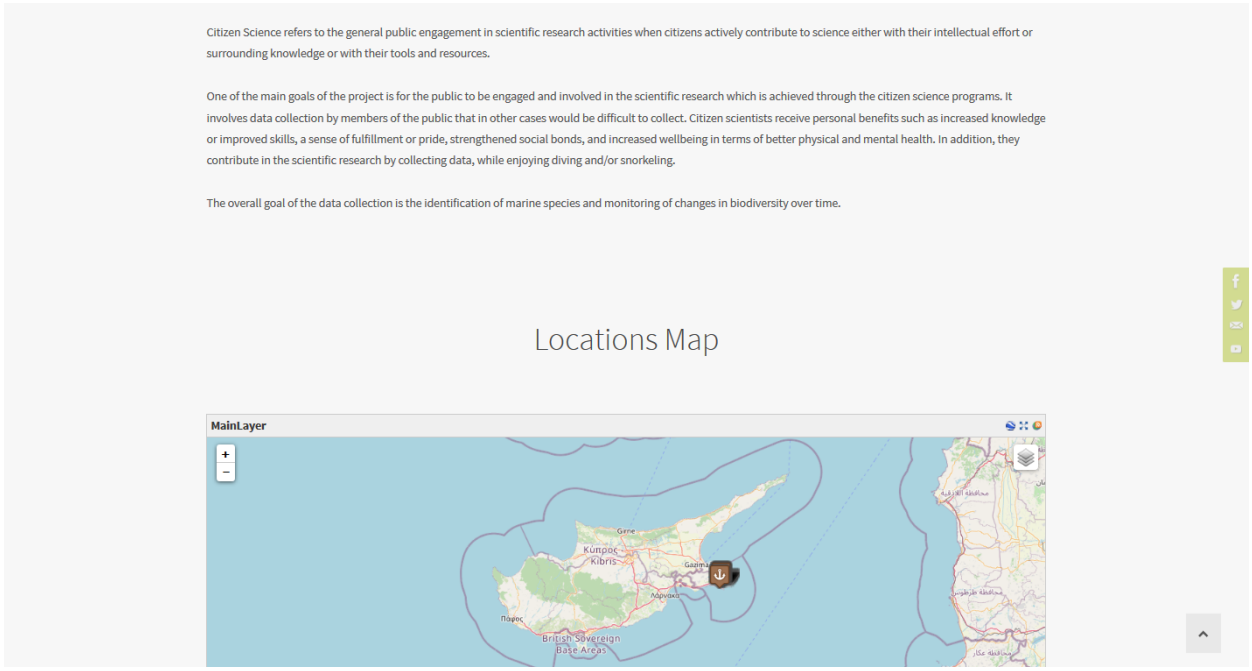


**Image 2:** The map indicating the diving spots selected in the Cavo Greco marine protected area, in Cyprus, as displayed in the main page.

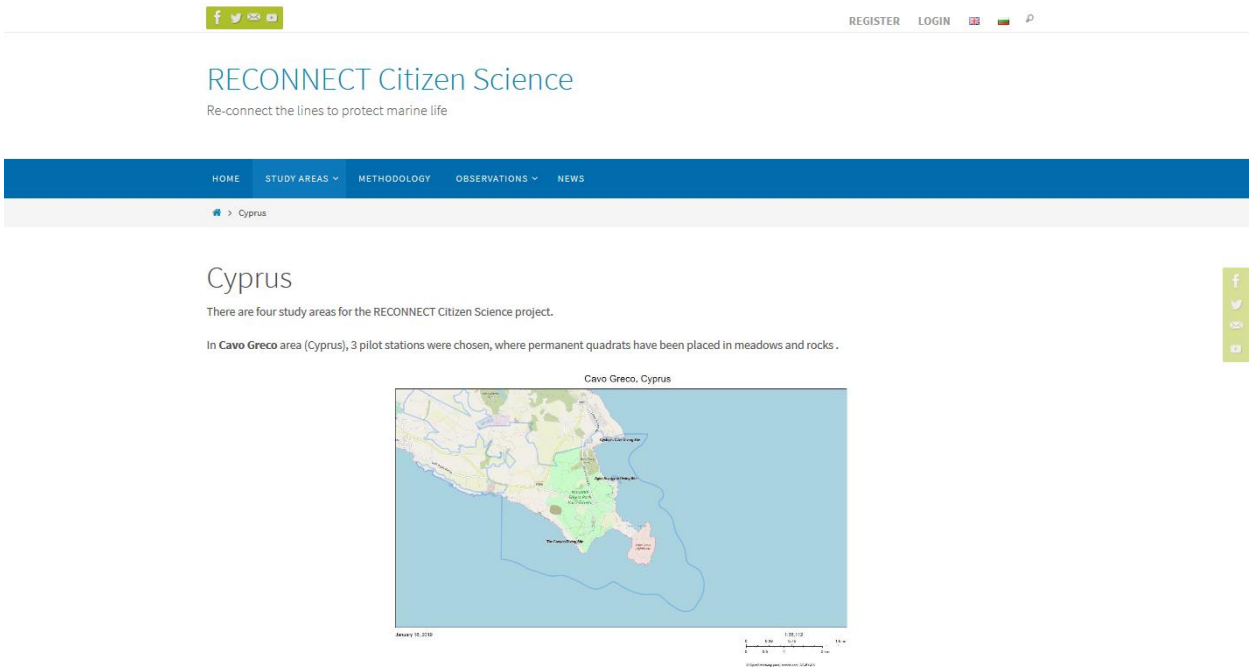


**Image 3:** The "Study Areas" section, showing the dive sites selected in Cyprus.

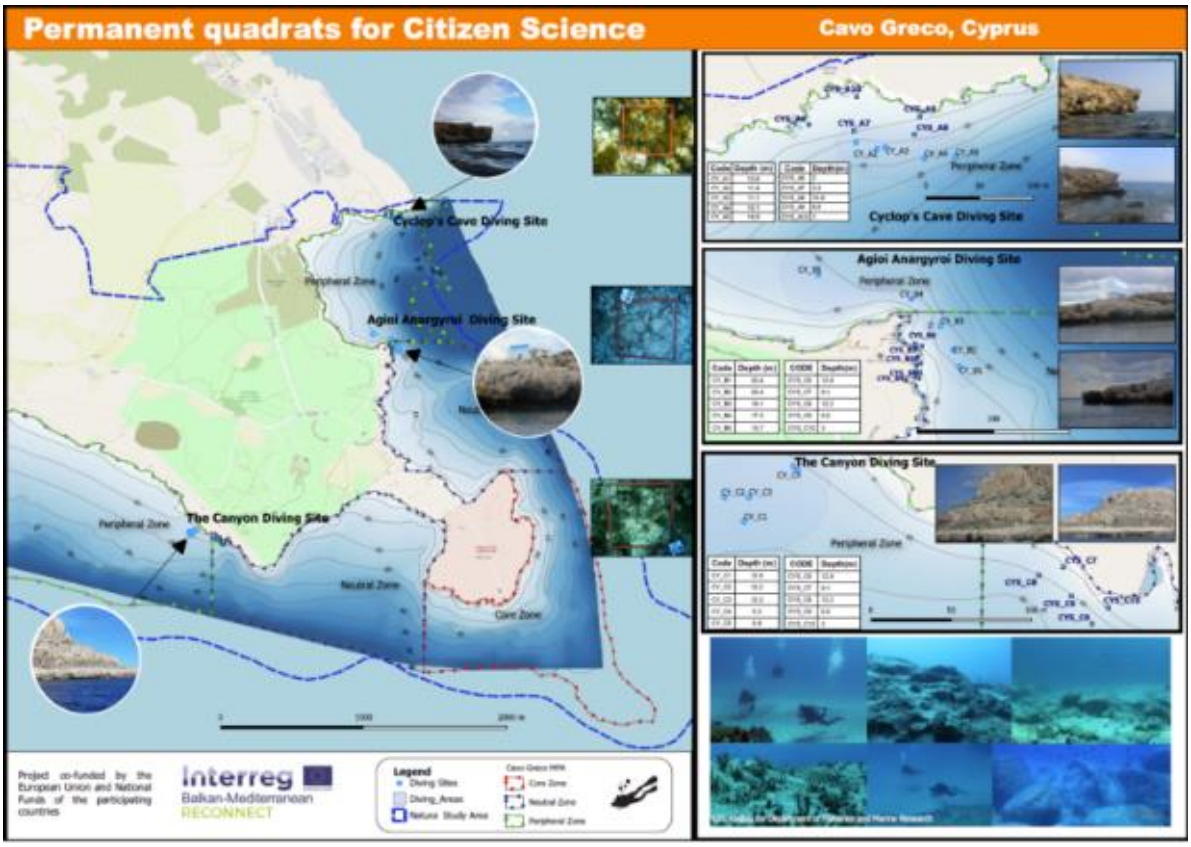


**Image 4:** The map prepared by DBS-UCY's external expert GE Geometric Ltd, to showcase the three diving spots of Cyprus and the permanent quadrats placed there.

Each pilot station has 10 permanent quadrats. Submerged buoys have been attached to the quadrats, rising 1-2 m from the seafloor to mark the quadrats locations, as well as identification labels.


**Image 5:** Example of a permanent quadrat as placed in a *Posidonia oceanica* meadow in Cavo Greco Cyprus. This picture was displayed in the "Study Areas" section in the citizen science platform.

Pilot stations in Cyprus:

**Ag. Anargyroi (Chapel):**

The site is located near Cavo Greco, just in front of the chapel of Ag. Anargyroi.

The depths are between 0-30 meters.

The substrate is mostly rocky, it alternates with large meadows of Posidonia oceanica.

Entering the water (with caution because in some places there are rough and slippery rocks), depths starts at 7 meters.

**Image 6:** A picture and a description displayed in the citizen science platform, showcasing Ayioi Anargyroi site, which is one of the three diving sites selected in the study site of Cyprus.

**Cyclopes cave:**

The area is accessible both by land and sea.

The depths of the route are between 0-25 meters.

The substrate is mostly rocky.

Entering the water, the substrate is initially rocky for about 50 meters (southeast), reaching 5 meters depth, having the land on our left.

**Image 7:** A picture and a description displayed in the citizen science platform, showcasing Cyclops cave diving site, in Cavo Greco, Cyprus.

**Canyon:**

Situated at the south side of Cape Greco just under the cliffs, access is from the shore.

Maximum depth is 18 meters.

RECONNECT project
Project co-funded by the European Union and National Funds of the participating countries.
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**Image 8:** A picture and a description displayed in the citizen science platform, showcasing Canyon diving site, in Cavo Greco, Cyprus.

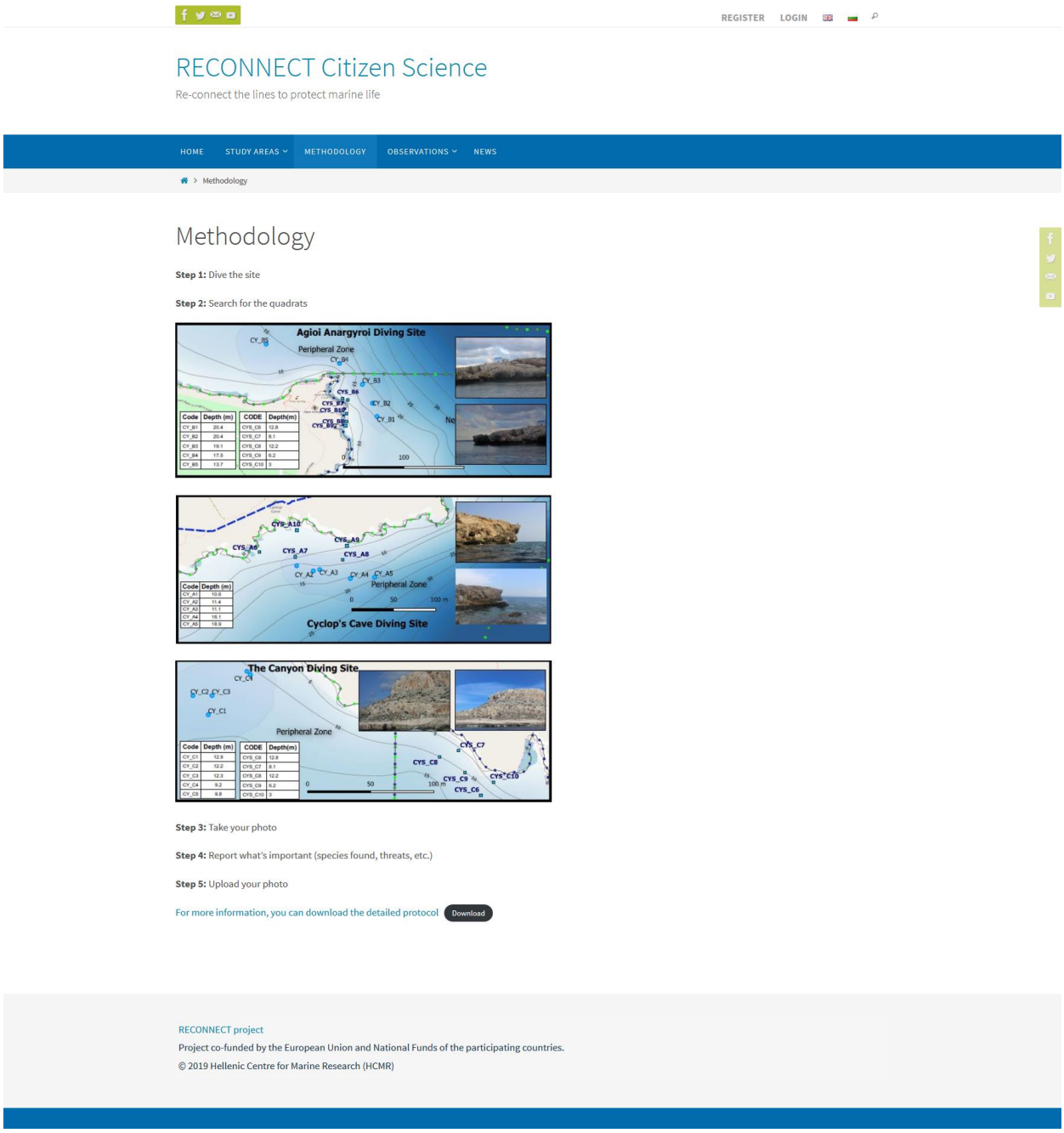


**Image 9:** The RECONNECT's methodology as explained in the citizen science online platform.

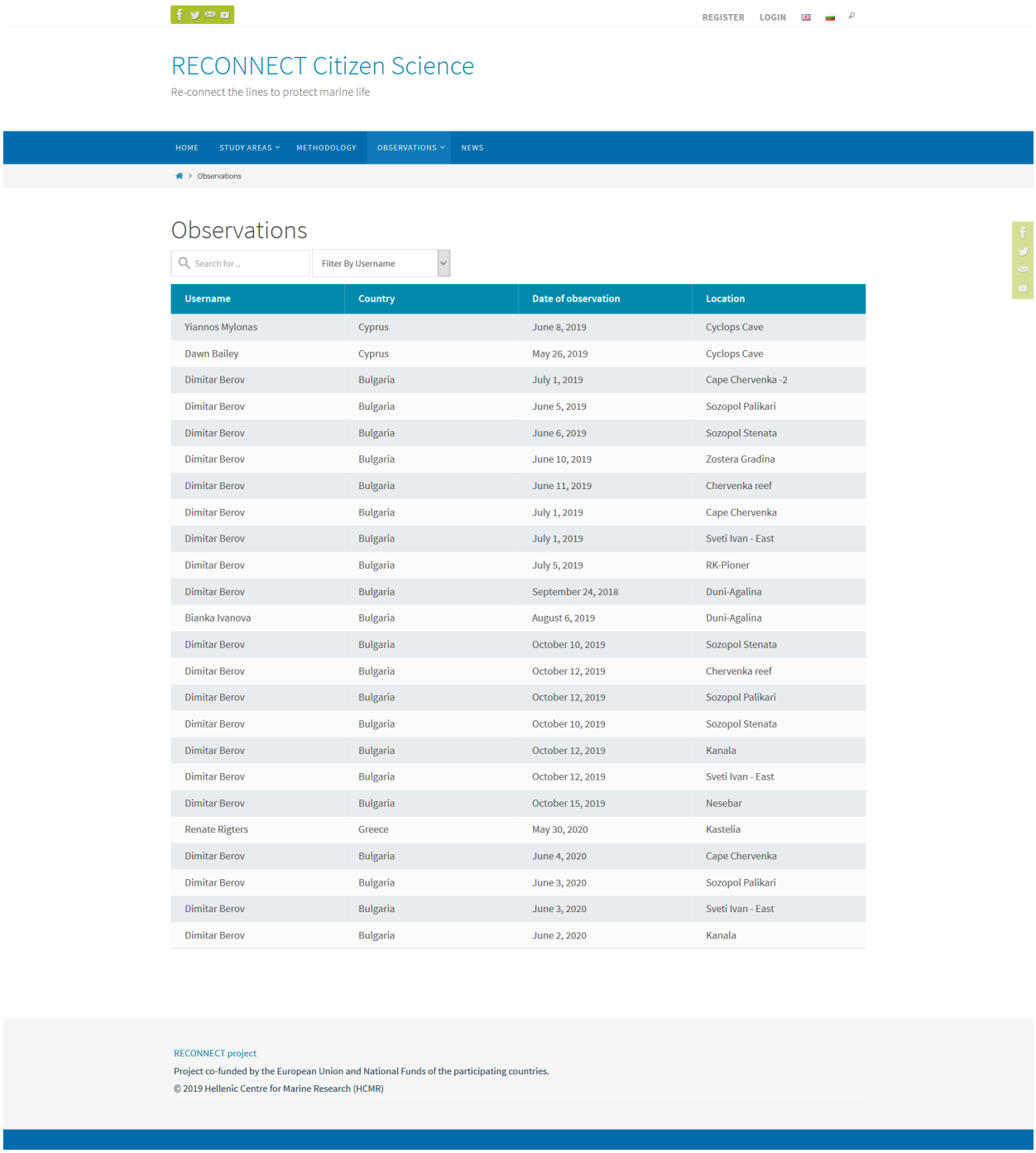


**Image 10:** The observations as submitted by citizen scientists in Cyprus, Bulgaria and Greece.

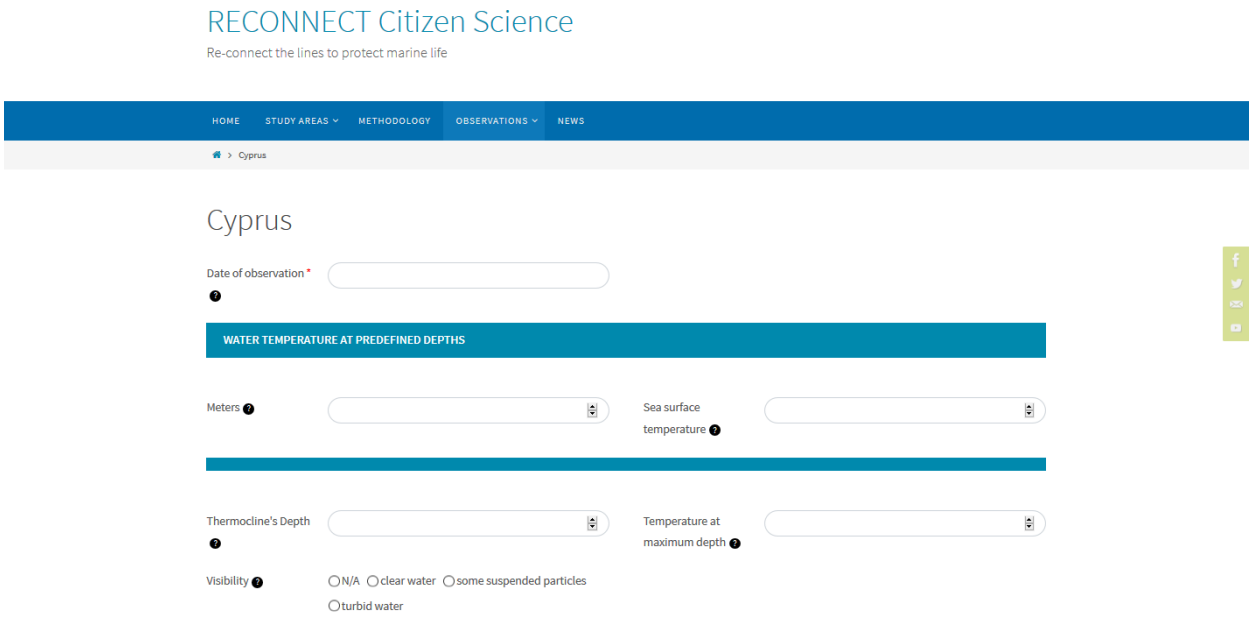


**Image 11:** Adding an observation for the Cypriot study site, in the citizen science platform. This section requested some information regarding the water temperature, thermocline's depth and the water's visibility.

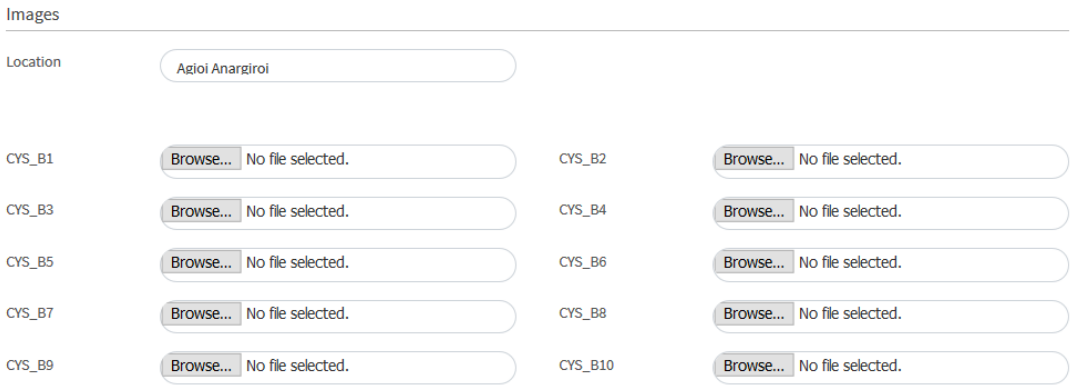


**Image 12:** The uploading images section. A citizen scientist had the opportunity to upload a picture for a specific permanent quadrat just by uploading it in the browsing tab of the quadrat's label.

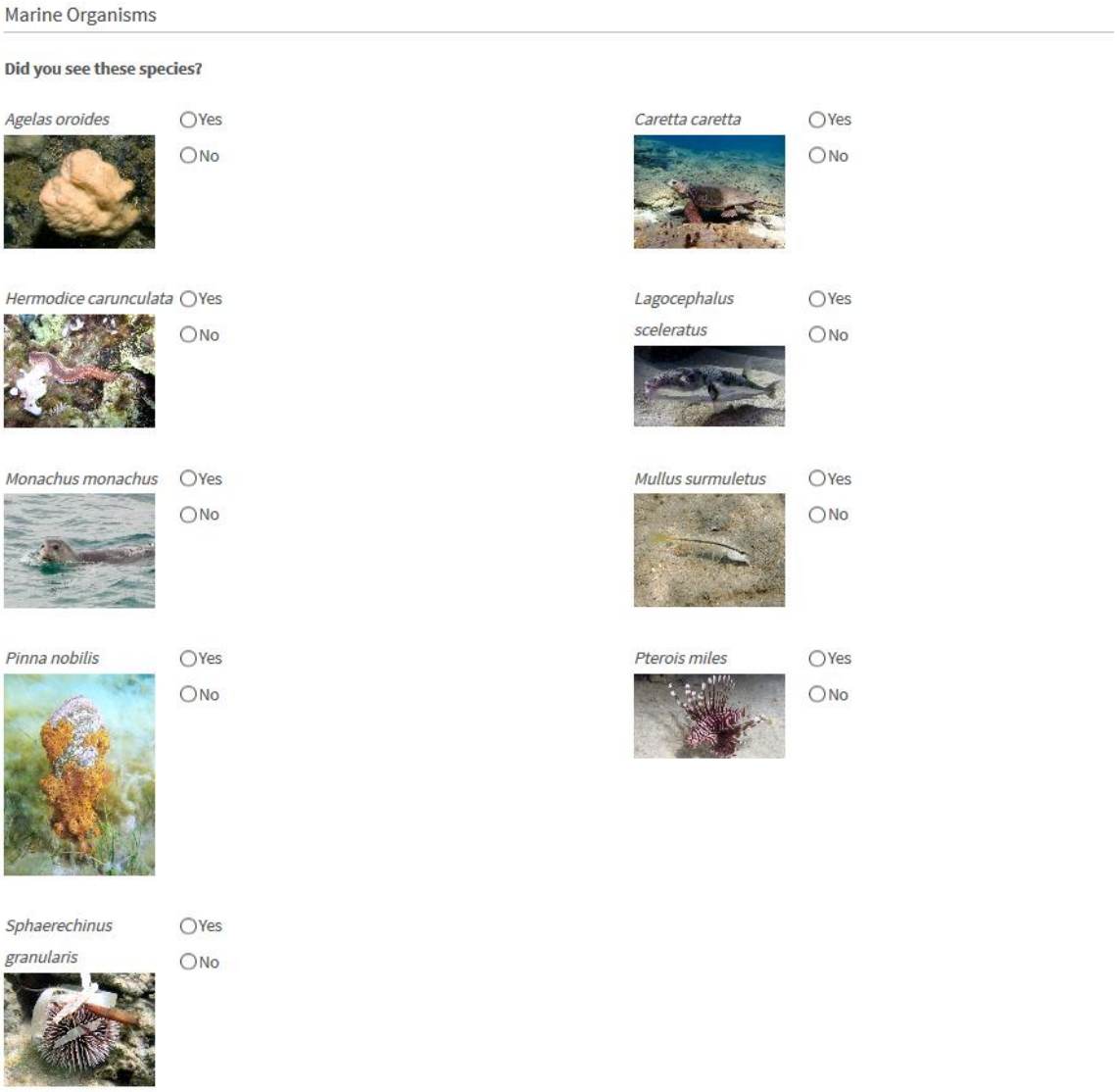


**Image 13:** The citizen scientists were additionally requested if they observed these species during their dive. They could simply record this by replying to a Yes/No question next to a species' picture.

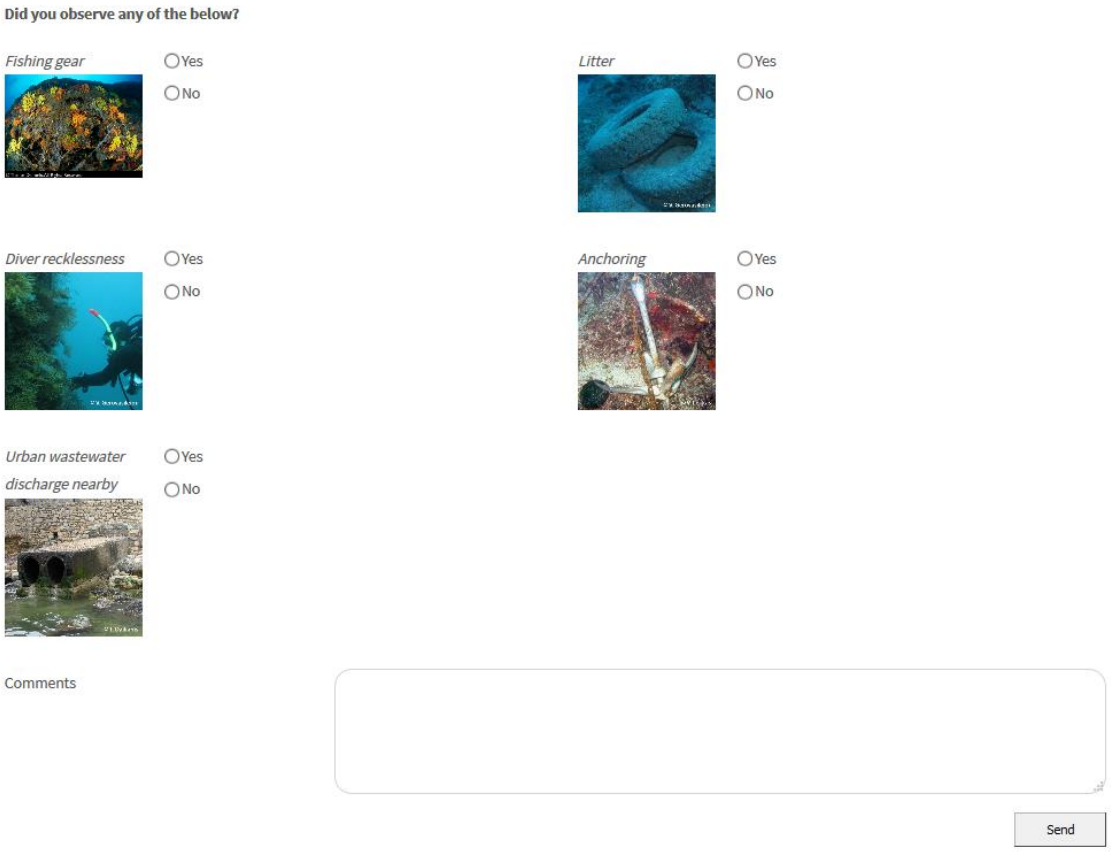


**Image 14:** The last section of adding an observation. The citizen scientists were lastly questioned whether they observed any of the anthropogenic threats mentioned above. This included a) fishing gear abandonment, b) marine litter, c) diver recklessness, d) anchoring and e) urban wastewater discharge near the diving site. Additionally, a comment section was added below, in order to give them the ability to document anything else not included above.

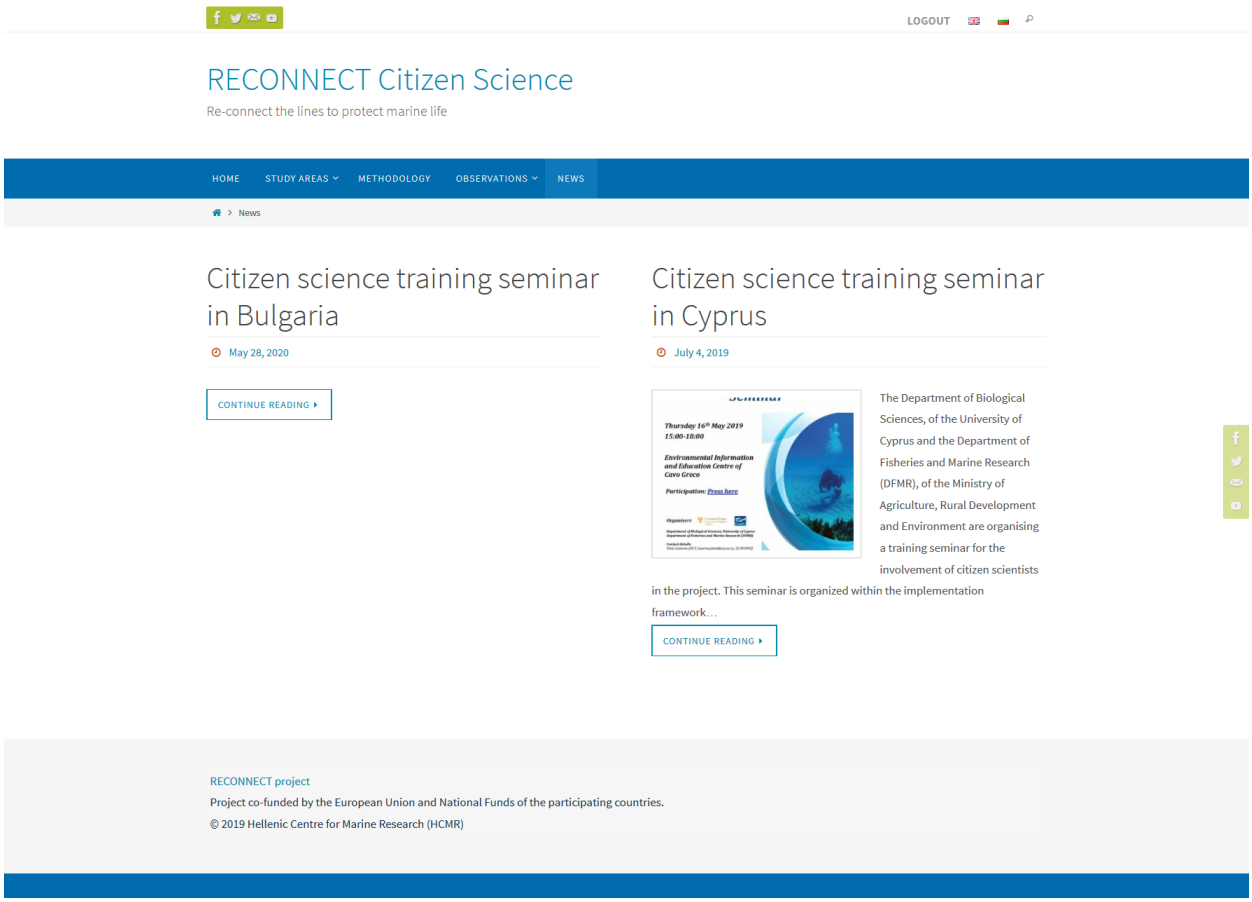


**Image 15:** The news section in the citizen science platform.


**Image 16:** The citizen science training seminar hosted by the Department of Biological Sciences and the Department of Fisheries and Marine Research, as advertised in the citizen science platform.

As seen in the images above, users of the online platform were able to find maps for each pilot site, which indicated the areas where the permanent quadrats were placed. Through this way, it was easier for them to dive to each site and locate each quadrat. The users were able to upload their pictures and provide some baseline information on what they have generally observed in the area, as well as some technical information concerning their dive. A list of key species for each country was also available and citizens were able to report if they have seen those species, and if they were under environmental threats.

# 2. THE CITIZEN SCIENCE TRAINING SEMINAR AS IMPLEMENTED IN CYPRUS

The successful implementation of citizen science projects is often correlated with the time the organizers spend on training the participants prior to their involvement in the projects. For the non-scientists it is often very hard to follow a specific methodology, neither do they realize why data needed to be collected and reported in a systematic way. For this reason, it is vital to dedicate some time, for explaining to the motivated citizens how they can properly contribute to the project.

## 2.1 Inviting stakeholders

The external expert of the Department of Biological Sciences of the University of Cyprus, AP Marine Environmental Consultancy Ltd was firstly responsible for preparing a stakeholders list targeting the diving community. AP Marine Ltd provided DBS-UCY a contact list which contained the information of citizens who might be interested in participating in the training. In order to respect the EU General Data Protection Regulation (GDPR) an application form was created to enable citizens to fill in their personal data and give their consent that their data will be used only in the context of the project RECONNECT. Forty-six participants signed and returned the application form (Image 17). Forty (40) out of 46 have expressed their interest in participating in the training seminar for citizen science.

**Application for further information on the RECONNECT project and its activities**

The RECONNECT project (Regional cooperation for the transnational ecosystem sustainable development), is implemented under the framework of the transnational Cooperation Programme Interreg V-B Balkan Mediterranean 2014-2020, and is co-funded by the European Union and National Funds of the participating countries. RECONNECT project aims to develop a transnational cooperative network for sustainable management of Marine Protected Areas (MPAs) and Natura 2000 sites. The new transnational and holistic approach which will be developed, will change the current protection strategies in the Balkan-Mediterranean area, promoting more efficient and accurate management practices. The main outputs of the RECONNECT project will provide information concerning habitat attributes, as well as the essential biodiversity, socio-economic and cultural variables of the participating countries.

An important innovative element of the RECONNECT Project is the involvement of civil society, through the evaluation of ecosystem services, using questionnaires. Subsequently, the project partners plan to implement training seminars for stakeholders, in order to contribute to the systematic monitoring and evaluation of the marine ecosystems.

***Respecting the European «GDPR» policy, for the protection of personal data.***

The General Data Protection Regulation (GDPR) which was applied on 25th May 2018, aims to protect the rights of natural persons regarding the processing of their personal data. Considering this policy, you are invited to fill in the below application form and give us your consent in including your personal information (email) in the RECONNECT project's database. Your personal data will only be used for communication purposes with you, through the promotion of informative material, like the project's newsletters, and for informing you about our future activities (such as the citizen science training). Your data will be deleted twelve months after the end of the RECONNECT project. Please be aware that at any time, you have the right to ask for your data to be deleted from our database by contacting us at reconnect@hcmr.gr.

Are you interested in receiving updates for the RECONNECT project?

YES/NO

Are you interested in participating in the training workshop on citizen science actions?

YES/NO

Full Name: ……..

Email address: ……

Date: ……

Signature: ……..

**Image 17:** The application form sent to diving instructors in order to define their interest in participating in the citizen science training seminar.

### 2.2 Selecting the correct date

For the best organization of the "Citizen Science Training Seminar", AP Marine designed a poll through an online calendar tool (Doodle poll) and the interested people were invited to participate, voting the most suitable day for them. This increased the chances of selecting the optimum date and time for the interesting parties and possibly increase the attendance numbers. Based on the Doodle poll, the seminar was decided to be organized on Thursday 16th of May 2019, at 15:00-18:00.

### 2.3 Selecting the place

Since Cavo Greco was the marine protected area chosen for Cyprus, it was decided to host the training seminar at the Environmental Information and Education Centre of Cavo Greco. This Environmental Centre was under the jurisdiction of the Department of Forests, thus DBS-UCY had to officially request to rent the centre for hosting this event. The request was written in Greek and was addressed to the director of the Department of Forests. They accepted our request and asked us to pay the renting fees forward, and so we did.

### 2.4 Booking catering services

Since 40 people officially expressed their interest in participating in this training seminar, DBS-UCY proceeded with the tender request procedure. Five well-known catering companies were contacted on the same time, via email and were requested to send their tender which had to cover the needs of 40 people. For the specific event the catering companies were requested to provide:

a) The necessities for a coffee break at 14:45, such as coffee, tea, juice, water as well as biscuits. Since the seminar was hosted during lunch time, this was considered necessary for giving the participants the energy needed for successfully attending the seminar.
b) Cocktail type dinner and non-alcoholic drinks at 18:00 for giving them the opportunity to break-the-ice and get together as a group.

The company which submitted the tender with the lowest price was selected. They additionally offered the services of two waiters and the relevant catering equipment (e.g. high tables, tablecloths, dishes, glasses, cups, napkins etc.)

## 2.5 The Final agenda of the Citizen Science training seminar in Cyprus

Interreg Balkan-Mediterranean RECONNECT

Regional cooperation for the transnational ecosystem sustainable development

# Citizen Science Training Seminar

***Thursday 16th May 2019***

***15:00-18:00***

***Environmental Information and Education Centre of Cavo Greco***

***Participation: Press here***

***Organisers*** University of Cyprus Department of Biological Sciences

***Department of Biological Sciences, University of Cyprus***
***Department of Fisheries and Marine Research (DFMR)***

***Contact details:***
*Yiota Lazarou (UCY, lazarou.yiota@ucy.ac.cy, 22 893995)*
*Maria Rousou (DFMR, mrousou@dfmr.moa.gov.cy, 22807832)*

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Balkan-Mediterranean
RECONNECT

Regional cooperation for the
transnational ecosystem sustainable development

*Citizen Science Training Seminar at the*

*Environmental Information and Education Centre of Cavo Greco*

# Agenda

| | |
|---|---|
| **15:00 –15:15** | **Registrations and Coffee Break** |
| **15:15– 15:30** | **Welcome speeches**<br>*Dr. Spyros Sfenthourakis, Professor of Department of Biological Sciences, University of Cyprus* |
| **15:30 – 15:45** | **Presenting the RECONNECT research project**<br>*Dr. Maria Rousou, Department of Fisheries and Marine Research* |
| **15:45 – 16:00** | **Information on the Cavo Greco protected area / Video**<br>*Mr. Chrysostomos Chrysostomou, Forestry Department* |
| **16:00 – 16:30** | **The marine environment of Cavo Greco (RECONNECT)**<br>*Dr. Demetris Kletou, DFMR's external expert*<br>*Marine and Environmental Research (MER) Lab Ltd* |
| **16:30 – 17:00** | **Citizen Science involvement in monitoring the marine environment of Cavo Greco (RECONNECT)**<br>*Mr. Antonis Petrou, UCY's external expert*<br>*AP Marine Environmental Consultancy Ltd* |
| **17:00 – 17:15** | **RELIONMED LIFE: Preventing a LIONfish invasion in the MEDiterranean through early response and targeted Removal**<br>*Mrs Yiota Lazarou, Department of Biological Sciences, University of Cyprus* |
| **17:15-17:30** | **Questionnaire completion and Discussion** |
| **17:30-18:00** | **End of event / Certificates**<br>**Light dinner** |

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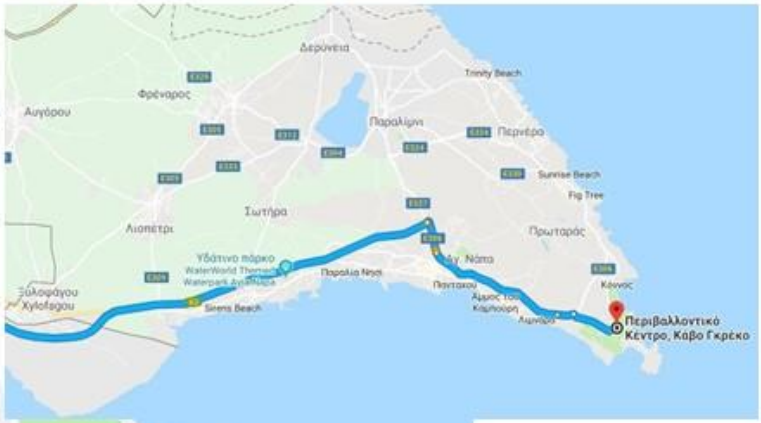
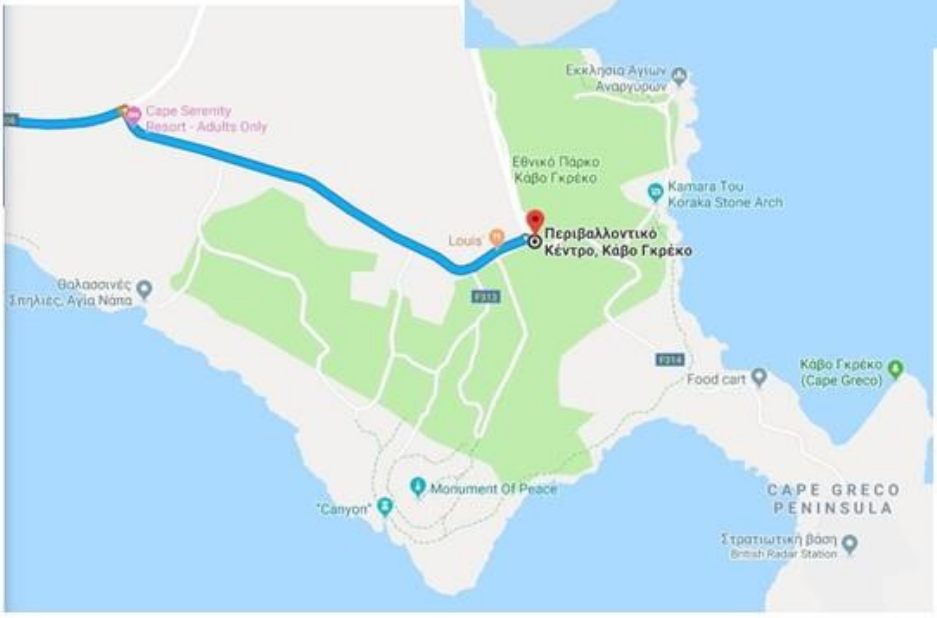
# *Environmental Information and Education Centre of Cavo Greco*

## *How to find-us ?*




*Contact details of ECCG*

- *Address: Cavo Greco 0101, 5330 Ayia Napa*
- *Phone-numbers: 23-814412/23814415*

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### 2.6 Advertising the event in social media pages

The training seminar's agenda was forwarded via email to all the interested parties. Additionally, to increase the attendance numbers, Ms. Yiota Lazarou who was the project manager on behalf of the Department of Biological Sciences, of the University of Cyprus took the initiative to personally cover the expenses of a Facebook add. For this purpose, a short video of 12'' was created showcasing the seminar's final agenda.

As can be seen from the history panel (Image 18) of the advertisement's activity, the ad was created on the 13th of May. As a bid strategy the lowest cost option was chosen. Then, the audience was targeted as can be seen in Image 19. The advertisement run from 14th of May until 16th of May at 18:00. As can be seen in the Performance graph (Image 20), the advertisement had 19 event responses and 3027 people reached in total. Additionally, based on the Demographics graph (Image 21), the following number of people responded to the event and reached to the event:

- No people responded or reached the event aged 13-17.
- There were 3 event responses from females, and 1 from men, and 215 females and 244 men reached, aged 18-24.
- There were 3 event responses from females, and 7 from men, and 480 females and 527 men reached, aged 25-34.
- There were 3 event responses from females, and 1 from men, and 383 females and 342 men reached, aged 35-44.
- There was 1 event response from females, and 0 from men, and 189 females and 198 men reached, aged 45-54.
- Zero females and men responded and 88 and 143 reached accordingly aged 55-64.
- Zero females and men responded and 87 and 91 reached accordingly aged 65+.

Regarding the performance graph (Image 22), 3027 people reached compared to the 4000 people targeted with the amount spent. Facebook additionally recorded 3899 people's impressions compared to the 4000 which was targeted based on the amount spent.

Activity types: All ▾ Changed by: Anyone ▾

| Activity | Activity Details | Item Changed | Changed by | Date and Time |
|---|---|---|---|---|
| Ad status updated | From **Inactive** to **Inactive** | Event: Citizen Science Training Seminar<br>Ad ID: 23843809541500780 | Facebook | 16 May 2019 at 18:00 |
| Ad status updated | From **Active** to **Inactive** | Event: Citizen Science Training Seminar<br>Ad ID: 23843809541500780 | Yiota Lazarou | 16 May 2019 at 18:00 |
| Ad delivered | Started delivery | Event: Citizen Science Training Seminar<br>Ad ID: 23843809541500780 | Facebook | 14 May 2019 at 23:21 |
| Ad status updated | From **Pending Review** to **Active** | Event: Citizen Science Training Seminar<br>Ad ID: 23843809541500780 | Facebook | 14 May 2019 at 22:51 |
| Ad created | — | Event: Citizen Science Training Seminar<br>Ad ID: 23843809541500780 | Yiota Lazarou | 13 May 2019 at 21:01 |
| Ad set targeting updated | Audience Change ⓘ | Event: Citizen Science Training Seminar<br>Ad set ID: 23843809541470780 | Yiota Lazarou | 13 May 2019 at 21:01 |
| Ad set optimisation goal updated | From — to **Event response** | Event: Citizen Science Training Seminar<br>Ad set ID: 23843809541470780 | Yiota Lazarou | 13 May 2019 at 21:01 |
| Ad set bid strategy updated | From — to **Lowest cost bid strategy** | Event: Citizen Science Training Seminar<br>Ad set ID: 23843809541470780 | Yiota Lazarou | 13 May 2019 at 21:01 |
| Ad set created | €10.00 Lifetime budget | Event: Citizen Science Training Seminar<br>Ad set ID: 23843809541470780 | Yiota Lazarou | 13 May 2019 at 21:01 |

**Image 18:** The advertisement's activity history.

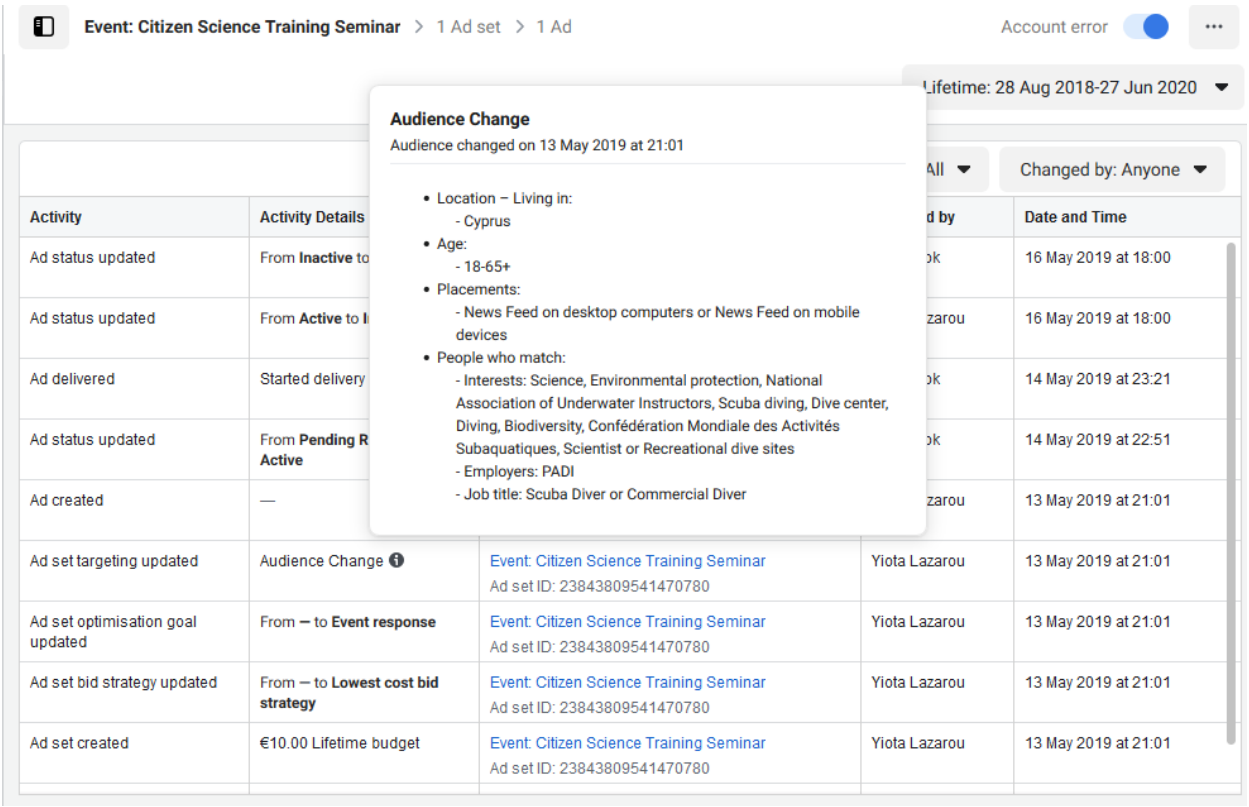



**Image 19:** The targeted audience.

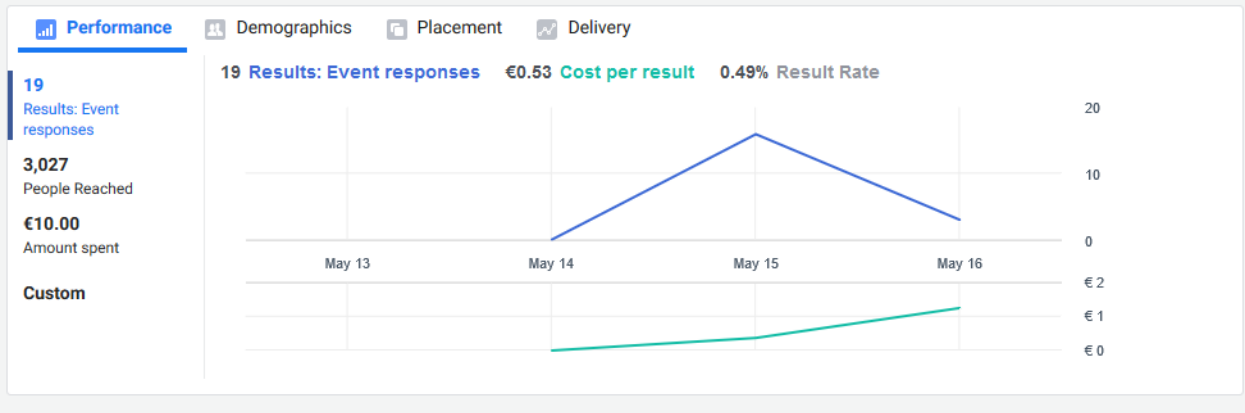



**Image 20:** The advertisement's performance success.

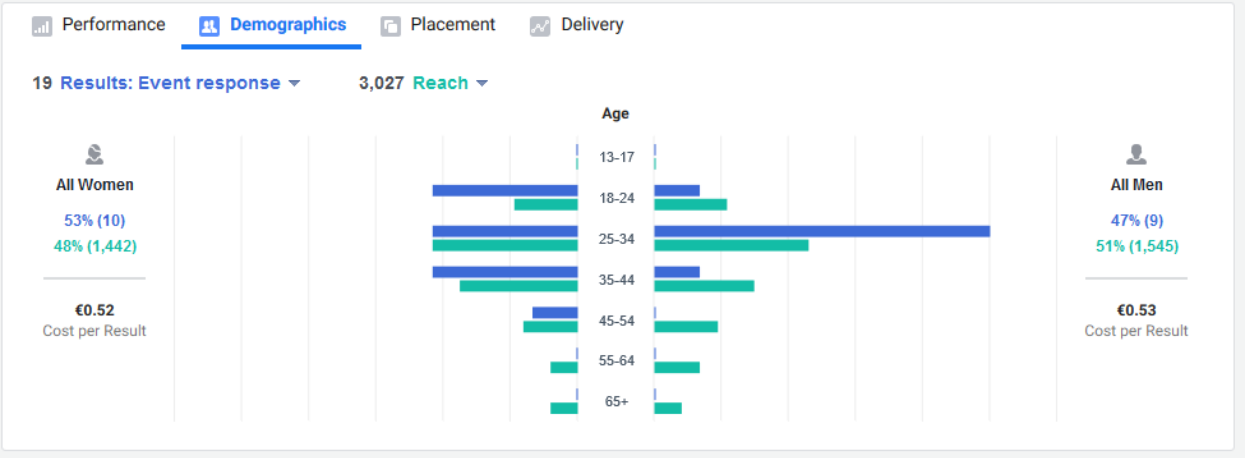



**Image 21:** The demographics of event responses and reaches.

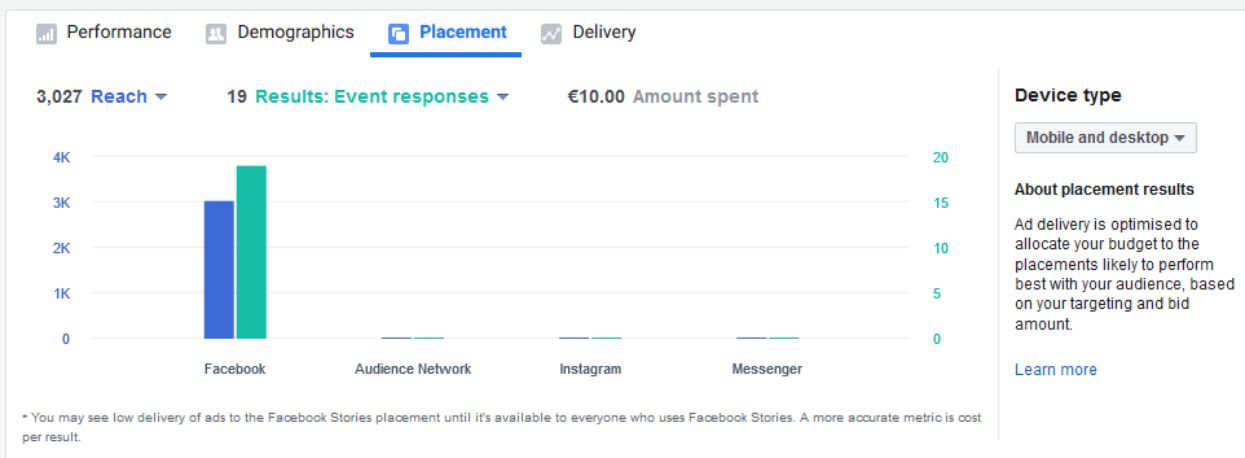



**Image 22:** The numbers of reaches and impressions recorded in Facebook, compared to the amount spent.

### 2.7 The citizen science kits

As mentioned in deliverable D3.X.1, in order to increase the project's engagement disseminating material were especially designed to be given to interested parties during open day events and of course during the citizen science training seminar. The citizen science kit (Images 23-25) had a paper portfolio, a notepad, a pen and a USB, the project's flyers in Greek and English and the citizen science flyers in Greek and English. A lanyard was also prepared, as well as the printed forms of the final agenda and of the citizen science questionnaire. These disseminating materials were placed in a Cotton bag, together with a T-shirt and a hat. Two citizen science posters (not displayed here) were additionally given to each participant, one in Greek and one in English. In total 50 sets were prepared, in case more people came.


**Image 23:** The citizen science kit as given to the participants during the citizen science training seminar.

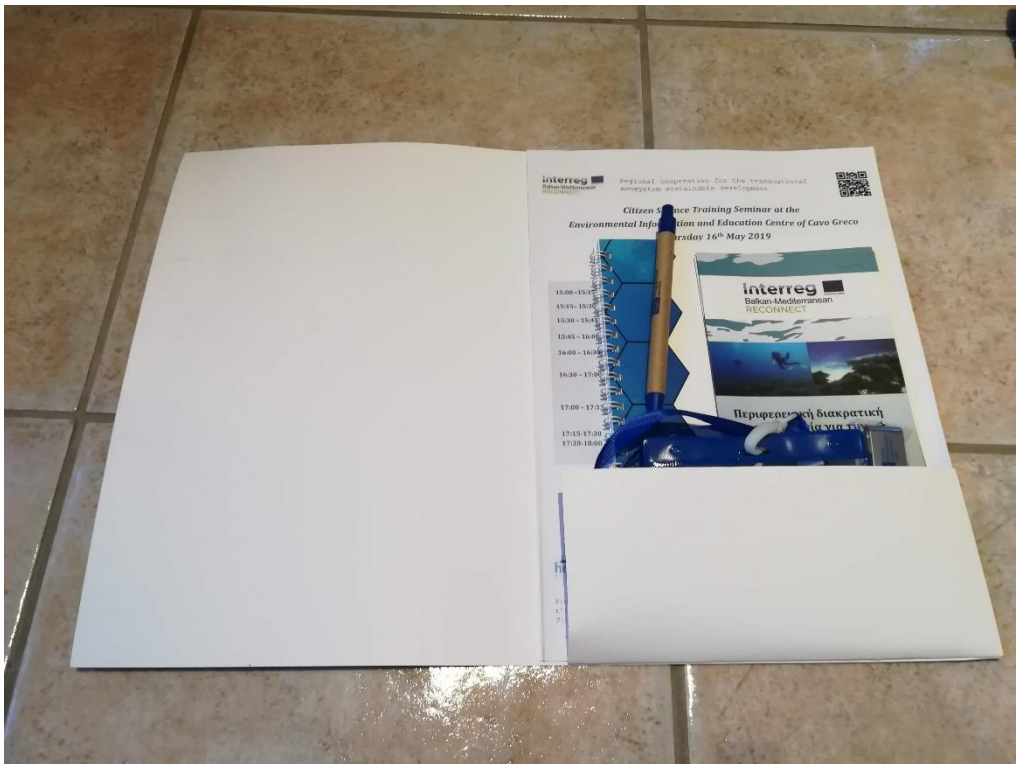


**Image 24:** The paper portfolio filled in with all the informative material needed for the seminar, as well as the disseminating material (pens, USBs, flyers) prepared for this purpose.


**Image 25:** The cotton bag and the paper portfolio of the citizen science kit.

### 2.8 Seminar day

Representatives of the Department of Biological Sciences of the University of Cyprus, as well as the Department of Fisheries and Marine Research prepared the reception area, by displaying the different t-shirt sizes, the hats, flyers and the reception list on the counter (Images 26-31). A bag filled with already rolled posters was displayed on the front. Each participant was invited to first register and collect his/her citizen science kit and then grab a coffee and drink before the initiation of the seminar.


**Image 26:** Ms. Yiota Lazarou handing in a citizen science kit


**Image 27:** Ms. Yiota Lazarou handing in a hat and a poster. The t-shirts can be seen in the far-left, between the two figures.

**Image 28:** Participants and organizers in front of the registration desk.


**Image 29:** Participants getting together before the initiation of the citizen science training seminar.

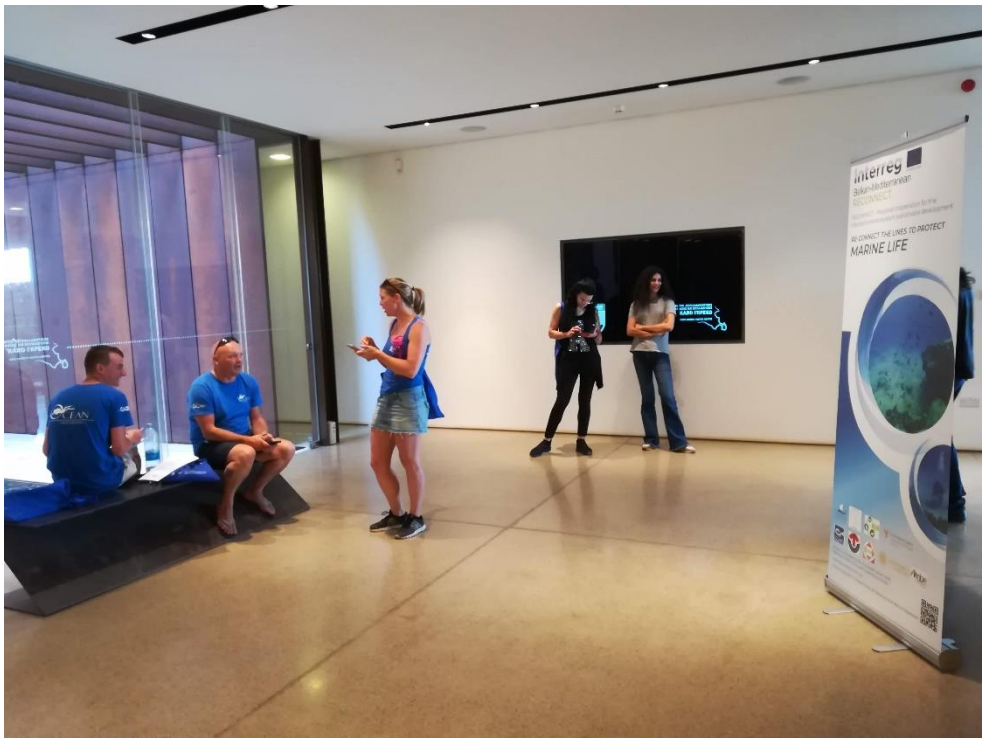



**Image 30:** Participants getting together before the initiation of the citizen science training seminar.


**Image 31:** Mr. Pavlos Diplaros from the Department of Biological Sciences of the University of Cyprus at the reception desk. The roll-up banner of the project can be seen in the far left, then the t-shirts for the citizen scientists separated in sizes, the hats and the cotton bags with the citizen science kit. Flyers from different projects, were also handed to the participants, in order to enhance the synergy between RECONNECT project and the Balkan Mediterranean project MELTEMI and the LIFE RELIONMED project.

As it was mentioned before, the training seminar (Images 32-43) had to begin with a short welcome speech by Dr. Spyros Sfenthourakis who was the project's coordinator on behalf of the Department of Biological Sciences of the University of Cyprus. Unfortunately, Dr. Sfenthourakis did not manage to attend the seminar, thus Ms. Yiota Lazarou welcomed the audience on his behalf (Image 32). It was decided to do the seminar in English, since most of the participants were speaking English fluently. This, however, was decided from the organization stages since each invited party was asked to indicate their language preference during their RSVP requests.

The seminar initiated with Dr. Maria Rousou (Image 33) from the Department of Fisheries and Marine Research, who gave a short presentation of the project RECONNECT's main objectives and current work completed at the time. Then, a video of the protected area was presented by Mr. Chrysostomos Chrysostomou (Image 34), a staff member of the Environmental Center. After that, Dr. Demetris Kletou (Images 35, 36)from the Marine and Environmental Research Lab Ltd (external expert of DFMR) gave a presentation on the importance of the marine protected area of Cavo Greco and the species that can be found there.

After that, a presentation by Mr. Antonis Petrou (Images 37,38) of the AP Marine Environmental Consultancy Ltd (external expert of DBS-UCY) presented the importance of the involvement of citizen scientists in monitoring and further protecting the marine environment of Cavo Greco, as well as the RECONNECT's methodology on the matter. As can be seen in Appendix 1, Mr. Petrou's first presentation included the nature of the marine environment and its basic characteristics along with the definitions of marine landscapes, habitats and species. Additionally, different aspects of marine pollution were analyzed such as, eutrophication and ocean acidification. It was also explained how different parties of the society can contribute to a healthier environment, with the main focus on how fishermen, tourists and divers can protect the environment. Furthermore, the definitions of Citizen and Marine Citizen Science were given along with the immediate benefits to the volunteers who participate in such projects.

The second presentation was mainly focused on the methodology which the citizen scientists will be required to use. It also included the best diving practices presented in the citizen science leaflet. Also, descriptions were briefly given about the three study areas. Following this, a video of the use of the citizen science platform was presented by Ms. Lazarou (Images 39,40), explaining all the steps required to follow to successfully add an observation on the online platform. Then, a presentation on RELIONMED-LIFE project was presented by Ms. Yiota Lazarou (Image 41) of the Department of Biological Science of the University of Cyprus. This presentation was given in the synergy framework between the two projects and based on the fact that both projects had chosen Cavo Greco as their pilot area, and both involved citizen science actions.

With the completion of the presentations the participants were requested to fill-in the citizen science questionnaires and give it back to the organizers (Image 42). Then, a discussion section was initiated, welcoming the participants to ask questions and suggest what they believed was important for further improving the citizen scientists' involvement. Many citizen scientists emphasized the need to organize additional events, in order to keep being interested and engaged to the project, such as organizing underwater photography competitions. All presentations can be found in Appendix 1.


**Image 32:** Ms. Yiota Lazarou from the DBS-UCY in the citizen science t-shirt welcoming the participants, before the initiation of the seminar, with the first presentation given by Dr. Maria Rousou, from DFMR.


**Image 33:** Dr. Maria Rousou presenting the RECONNECT project to the participants.


**Image 34:** Mr. Chrysostomos Chrysostomou from the Environmental Centre of Cavo Greco speaking shortly about the video about to screen regarding the protected are of Cape Greco and its importance.

**Image 35:** Dr. Demetris Kletou from MER Lab Ltd presenting the importance of the marine protected area of Cavo Greco and the species found there.

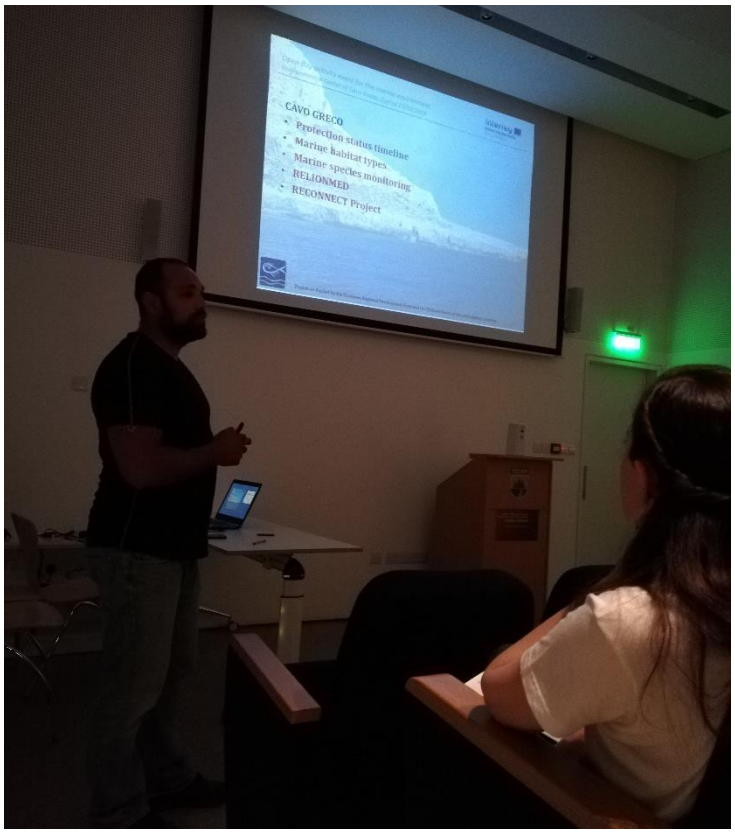



**Image 36:** Dr. Demetris Kletou from MER Lab Ltd presenting the importance of the marine protected area of Cavo Greco and the species found there.


**Image 37:** Mr. Antonis Petrou from AP Marine Environmental Consultancy Ltd presenting the importance of citizen science, the best diving practices, and the protocol the volunteers will need to follow in order to systematically collect data for the project.


**Image 38:** Mr. Antonis Petrou from AP Marine Environmental Consultancy Ltd presenting the importance of citizen science, the best diving practices, and the protocol the volunteers will need to follow in order to systematically collect data for the project.

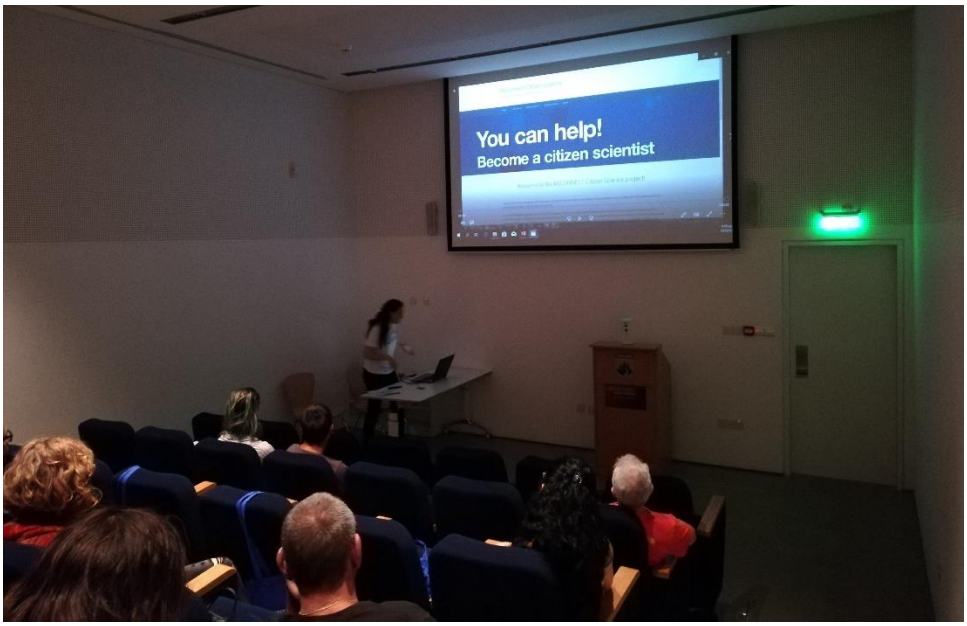



**Image 39:** Ms. Yiota Lazarou screening the short video prepared for explaining how to use the citizen science online platform.

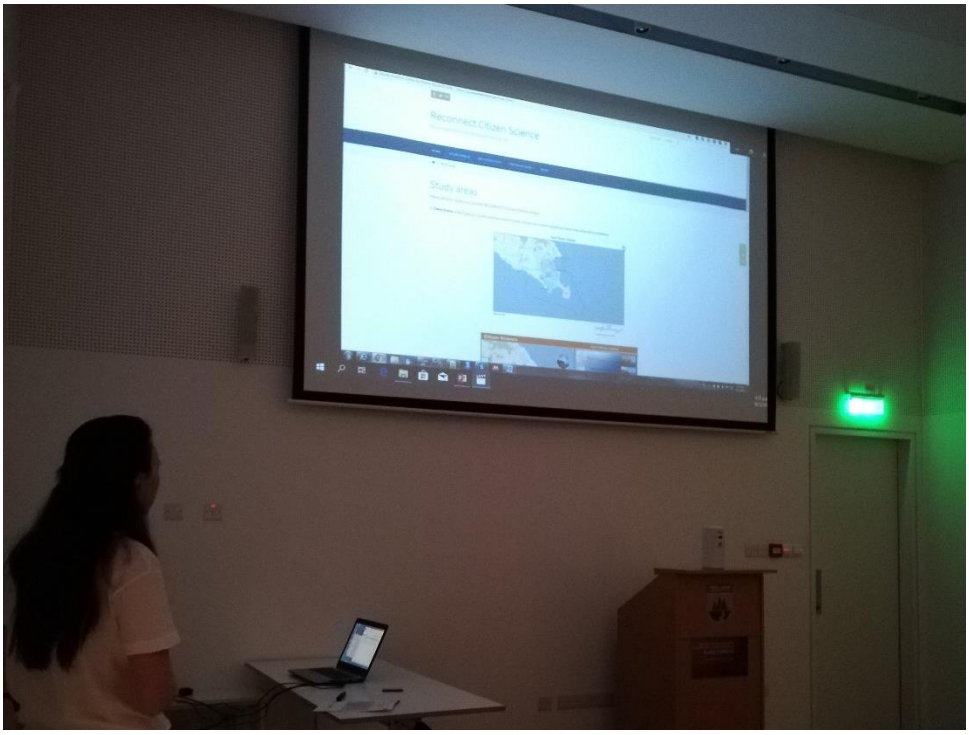


**Image 40:** Ms. Yiota Lazarou screening the short video prepared for explaining how to use the citizen science online platform.

**Image 41:** Ms. Yiota Lazarou giving a short presentation on LIFE RELIONMED project, in order to further enhance the synergy opportunities between the two projects.

**Image 42:** Participants filling-in the questionnaires given to them with the citizen science kit.


**Image 43:** Participants and organizers photographed together with the completion of the citizen science training seminar. From left to right, you can see Mr. Pavlos Diplaros and Ms. Yiota Lazarou from the Department of Biological Sciences of the University of Cyprus, Dr. Maria Rousou from the Department of Fisheries and Marine Research and two participants. Both organizers and participants are wearing the T-shirts and hats prepared as a citizen science kit, holding the cotton bags and the paper portfolios.

### 2.9 The Citizen Science Questionnaire and its results from Cyprus

In order to assess the participants' understanding of the project's expectations, a questionnaire which was created by AP Marine Environmental Consultancy Ltd and the Department of Biological Sciences of the University of Cyprus was given to them at the end of the training seminar.

The aims of the questionnaire were the following:

a) To examine if the citizen scientists understood what would be expected from them, how they would need to take their photos and how they would need to send their reports to the organizers.
b) To check whether they were previously involved in a citizen science project, and how they participated in that.
c) Collect general information regarding their diving experience.
d) Assess their understanding on what they should avoid during diving, in order to further protect the marine environment.

Overall, through this questionnaire, the organizers were able to assess the successfulness of the seminar and citizen scientists assessed the level of their understanding and asked the organizers for clarifications before they left the seminar.

It is also important to mention that although the registered participants on that day were 30 people, only 20 return their questionnaires completed. Thus, the sample size was 20.

You have been selected to take part in this survey because of your expertise and relevance to the project. Your participation in the survey is entirely voluntary. If you are happy to take part, please give your consent by writing a ✓in the box below, and by providing us your email. The survey should take approximately 10-15 minutes to complete.

Do you wish you take part in this survey, regarding citizen science, and best diving practices? If you do, please write a tick (✓) in this box. ☐

Email: ……

Your email will be held securely in a Google database. All data will be deleted 12 months after the project's end date. For further information, or if you have any queries, please contact reconnect@hcmr.gr. According to the General Data Protection Regulation (GDPR), you are free to withdraw your questionnaire responses from the project data set at any time, until the data are destroyed. You should note that the analysed questionnaire data may be used in the production of formal research outputs (e.g. journal articles, conference papers, and reports). Your answers will be treated confidentially and the information you provide will be kept anonymous in any research outputs/publications. You are advised to contact reconnect@hcmr.gr at the earliest opportunity, should you wish to withdraw from the survey. You do not need to give a reason. A decision to withdraw, or not to take part, will not affect you in any way.

## SECTION 1: Demographics

Please check the appropriate box or, where relevant, specify your answer.

1.1. **Age**:

| | | |
|---|---|---|
| 18-30 ☐ | 40-49 ☐ | 60-69 ☐ |
| 31-39 ☐ | 50-59 ☐ | 70 plus ☐ |

1.2. **Gender:**

Male ☐

Female ☐

1.3. **Educational level:**

Primary school ☐

High school ☐

University ☐

Master ☐

Doctorate/PHD ☐

1.4. **Nationality**:……..

1.5. **Occupation**:……..

**SECTION 2: Scuba diving profile**

Please check the appropriate box or, where relevant, specify your answer.

2.1. **Working in Scuba diving industry?**

YES ☐

NO ☐

2.2. **Date you began diving:** ……

2.3. **What is your diving organization (e.g. PADI, CMAS, NAUI?):**……

2.4. L**evel of certification:** ……

2.5. **Maximum depth attained**:……

2.6. **Date of last dive**:……..

2.7. **Approximate total number of dives:**……..

**SECTION 3:**

Please check the appropriate box or, where relevant, specify your answer.

3.1. **Did you hear about RECONNECT project before?**

YES ☐

NO ☐

3.2. **Have you ever participated in a Citizen Science project?**

YES ☐

NO ☐

If your answer was YES, which was this citizen science project, and how were you engaged?

……

……

……

……..

3.3. **Which of the following sentences describe the reasons for participating in this project?**

**Rate the most important reasons by 5 and the least by 1**

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| To spend quality time with my friends/family | ☐ | ☐ | ☐ | ☐ | ☐ |
| To acquire skills | ☐ | ☐ | ☐ | ☐ | ☐ |
| For networks and collaborations | ☐ | ☐ | ☐ | ☐ | ☐ |
| To spend time with like-minded people | ☐ | ☐ | ☐ | ☐ | ☐ |
| For the sake of future generations | ☐ | ☐ | ☐ | ☐ | ☐ |
| For public recognition | ☐ | ☐ | ☐ | ☐ | ☐ |
| For the sake of society/the environment | ☐ | ☐ | ☐ | ☐ | ☐ |
| For the knowledge gained | ☐ | ☐ | ☐ | ☐ | ☐ |
| For my interest in the subject under study | ☐ | ☐ | ☐ | ☐ | ☐ |
| For emotional satisfaction | ☐ | ☐ | ☐ | ☐ | ☐ |
| For the contribution I can give | ☐ | ☐ | ☐ | ☐ | ☐ |
| For personal satisfaction | ☐ | ☐ | ☐ | ☐ | ☐ |
| For the sake of science | ☐ | ☐ | ☐ | ☐ | ☐ |
| For the reward | ☐ | ☐ | ☐ | ☐ | ☐ |

3.4. **Did you ever visit the 3 pilot study areas (Agioi Anargyroi, Cyclops cave and Canyon)?**

YES ☐

NO ☐

IF YES, ANSWER THE FOLLOWING QUESTIONS:

3.4.a. **Declare which of them did you visit.**

Agioi Anargyroi ☐

Cyclops cave ☐

Canyon ☐

3.4.b. **How many times did you visit these sites?**.....

3.4.c. **How often do you visit these sites?**.....

3.4.d. **Do you plan visiting these sites this summer season?**

YES ☐

NO ☐

3.4.e. **Please evaluate the species richness (number of species) in these 3 pilot sites, according to your previous visits:**

| **AGIOI ANARGYROI:** | | **CYCLOPS CAVE:** | | **CANYON:** | |
|---|---|---|---|---|---|
| Very Rich | ☐ | Very Rich | ☐ | Very Rich | ☐ |
| Rich | ☐ | Rich | ☐ | Rich | ☐ |
| Medium | ☐ | Medium | ☐ | Medium | ☐ |
| Good | ☐ | Good | ☐ | Good | ☐ |
| Poor | ☐ | Poor | ☐ | Poor | ☐ |

## SECTION 4: Training Workshop-Best diving practices

Please check the appropriate box or, where relevant, specify your answer.

4.1. Please indicate your level of agreement with each of the following statements according to the training seminar you participated in:

| | **Very satisfied** | **Somewhat satisfied** | **Neutral** | **Somewhat dissatisfied** | **Very dissatisfied** |
|---|---|---|---|---|---|
| **Presentations** | | | | | |
| **Provided material** | | | | | |
| **Knowledge gained** | | | | | |
| **Methodology** | | | | | |

4.2. **Do you feel ready to use the methodology you have learnt in the training workshop?**

YES ☐

NO ☐

If NO state your reasons:

---

---

---

---

4.3. **State whether the following statement is either wrong or right:**

**1. Feeding fishes or any other marine species.**

Wrong ☐ Right ☐

Choose what applies:

a) It allows weak organisms to survive. ☐
b) It changes their behavior and diet. ☐
c) It allows close proximity to fish. ☐
d) Feeding attracts additional predators. ☐
e) Don't know. ☐

**2. Changing the position of marine species for the perfect photo.**

Wrong ☐ Right ☐

Choose what applies:

a) It changes their feeding behavior. ☐
b) They enjoy touching them. ☐
c) It provokes aggressive reactions. ☐
d) It changes their mating behavior. ☐
e) Don't know. ☐

**3. Good buoyancy control is important during diving.**

Wrong ☐ Right ☐

Choose what applies:

a) Use appropriate weights. ☐
b) Remain in a vertical position in the water. ☐
c) Don't stir the sandy bottom. ☐
d) Fully inflate your BCD while ascending. ☐
e) Don't know. ☐

**4. The diver-photographer must be sufficiently skilled so that underwater photography remains a reasonably safe activity.**

Wrong ☐ Right ☐

Choose what applies:

a) Get your buoyancy and diving skills down before taking a camera underwater. ☐

b) Heavy currents and poor visibility are the ideal conditions for underwater photography. ☐

c) Good diving skills are necessary to avoid damaging the reefs when you are closely approaching them. ☐

d) Move and orientate the marine life freely to get the perfect picture. ☐

e) Don't know. ☐

**5. Marine litter disposed by human activities pollute the marine ecosystem.**

Wrong ☐ Right ☐

Choose what applies:

a) Avoid buying single use plastics such as straws and plastic bags. ☐

b) Fertilizers and animal wastes do not pollute the marine ecosystem. ☐

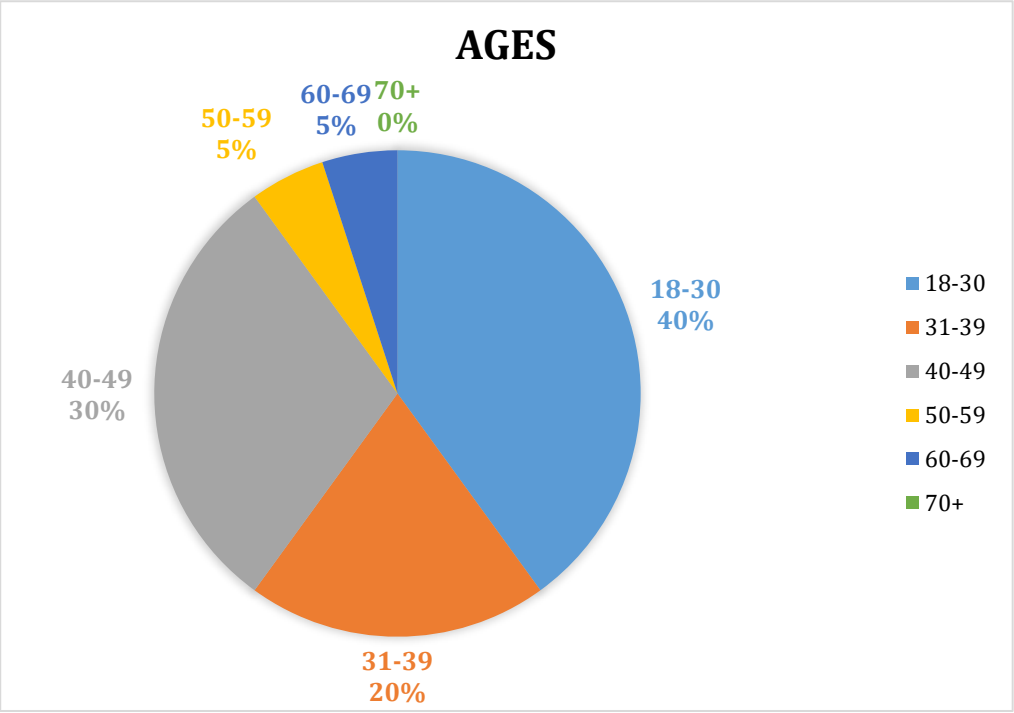
c) Microplastics and other marine litters bio accumulate in fish. ☐

d) Most of the marine litter especially plastics biodegrade very fast. ☐

e) Don't know. ☐

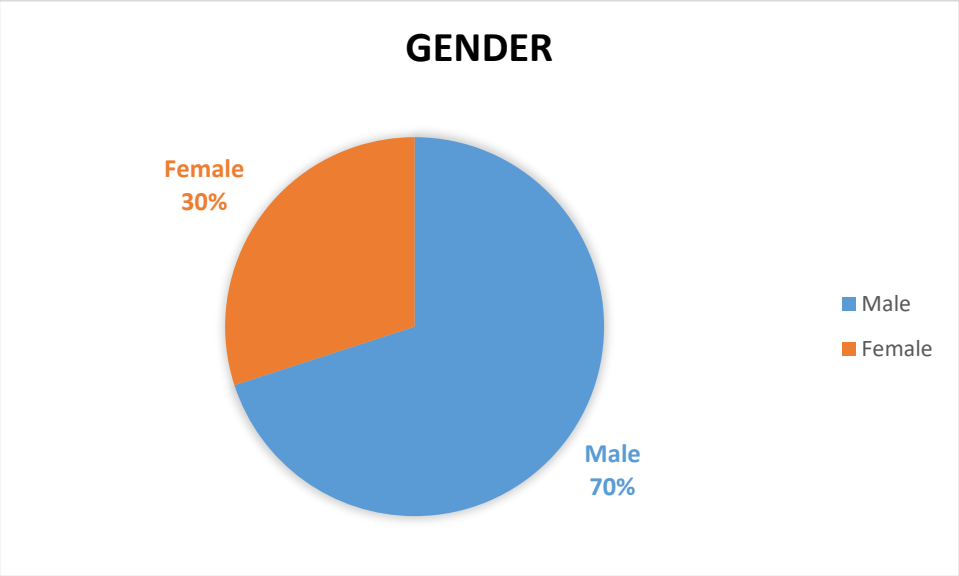
### 2.9.1 Demographics

The first section of the questionnaire contained questions regarding the demographics of the interviewees. As you can see from Graph 1 below, the majority of the participants (40%) were aged 18-30 years old. Thirty percent of the participants were aged 40-49 years old, 20% were aged 31-39, 5% were 50-59 and another 5% were 60-69 years old. There were no participants aged more than 70 years old.



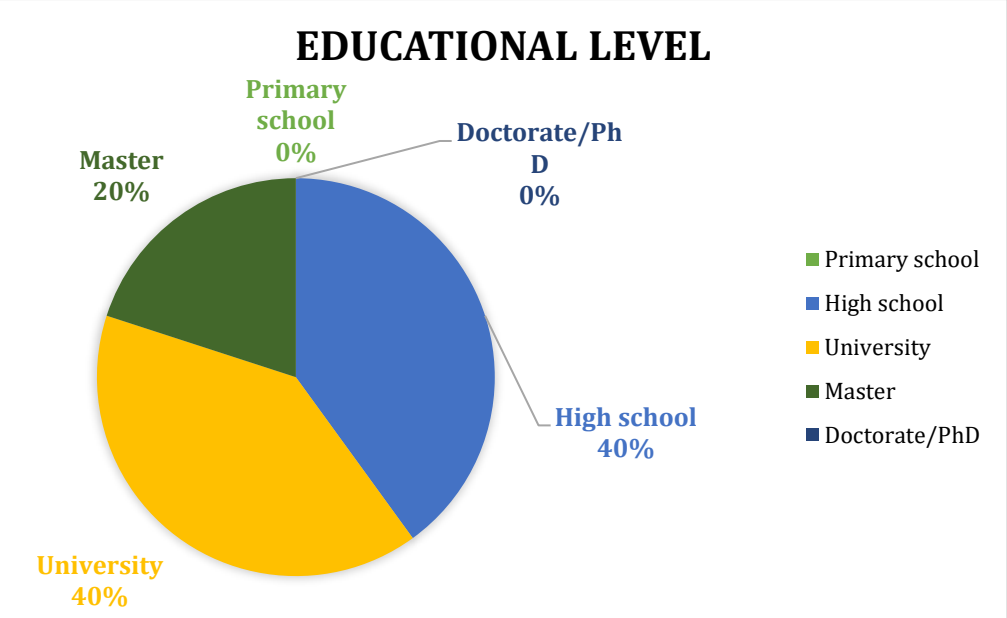

**Graph 1:** The age of the participants.

As you can see from Graph 2 below, 70% of the participants were male and 30% were female.



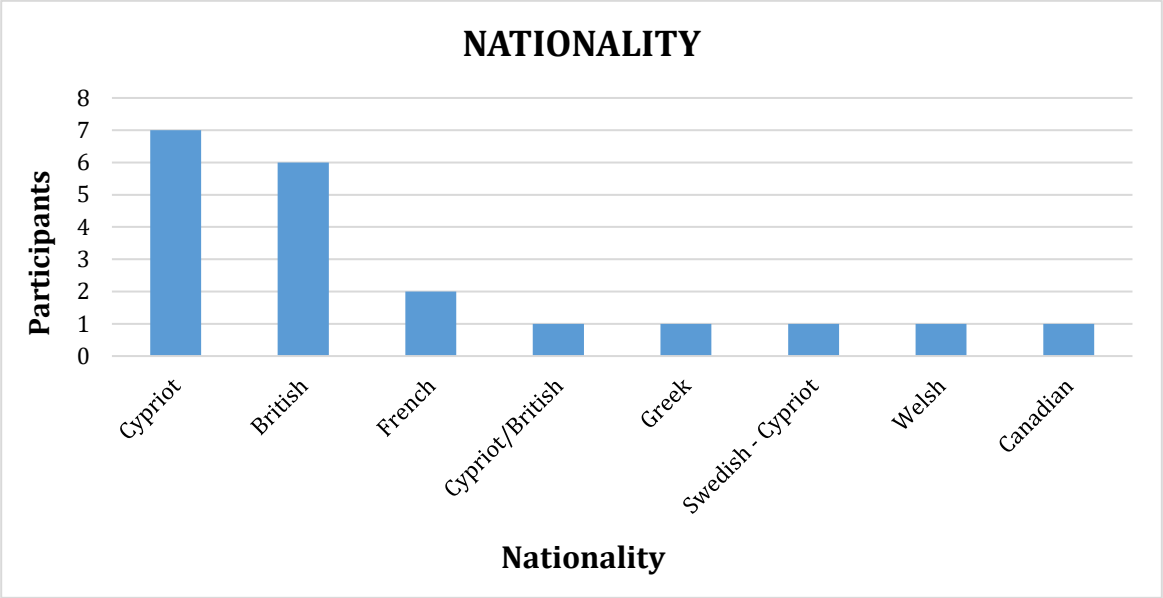

**Graph 2:** The Gender of the participants

As it can be seen in Graph 3, participants with a High School diploma and with a University degree had the same percentage (40%). Twenty percent of the participants had a Master's degree. There were no participants with a Primary school diploma, and none with a Doctorate.

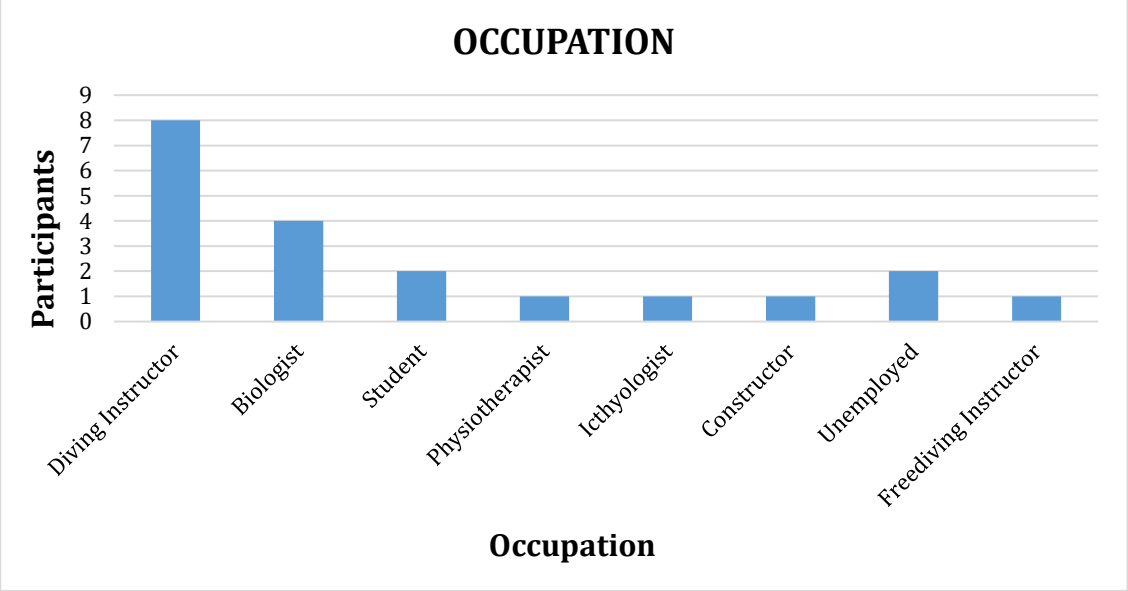



**Graph 3:** The educational level of the participants

Regarding the Nationality of the participants, as can be seen in Graph 4 below, the majority (7) of the participants were from Cyprus. Six of the participants were British, 2 were from France, one was Greek, one Welsh and another one Canadian. Two people had dual citizenships. One was Cypriot/British and another one was Cypriot/Swedish.




**Graph 4:** The Nationality of the participants

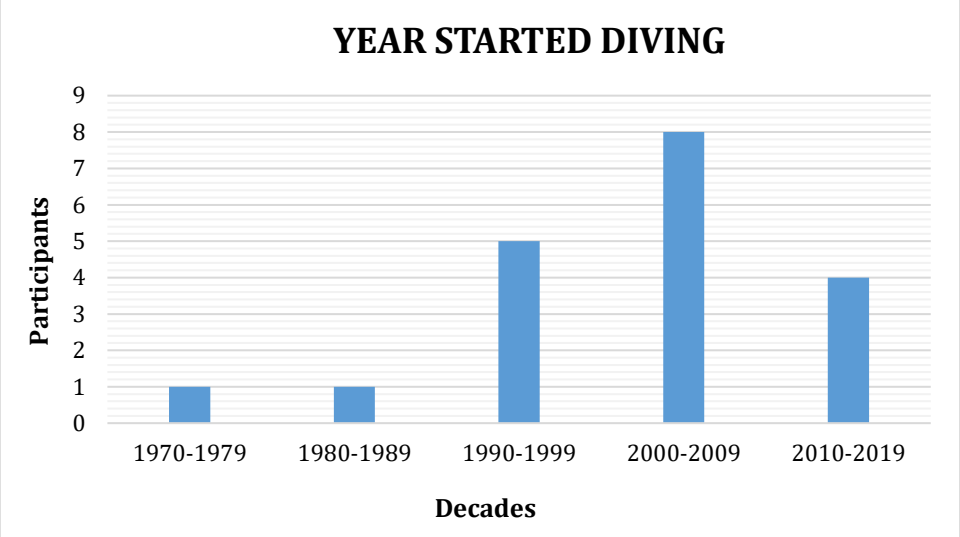



**Graph 5:** The Occupation of the participants

As can be seen from Graph 5 above, the majority of the participants (8 out of 20) were diving instructors, as was initially targeted. Four of the participants were biologists, 2 were still students at a University, 1 was a physiotherapist, 1 was an ichthyologist, 1 was a constructor, 2 were unemployed and 1 was a freediving instructor.

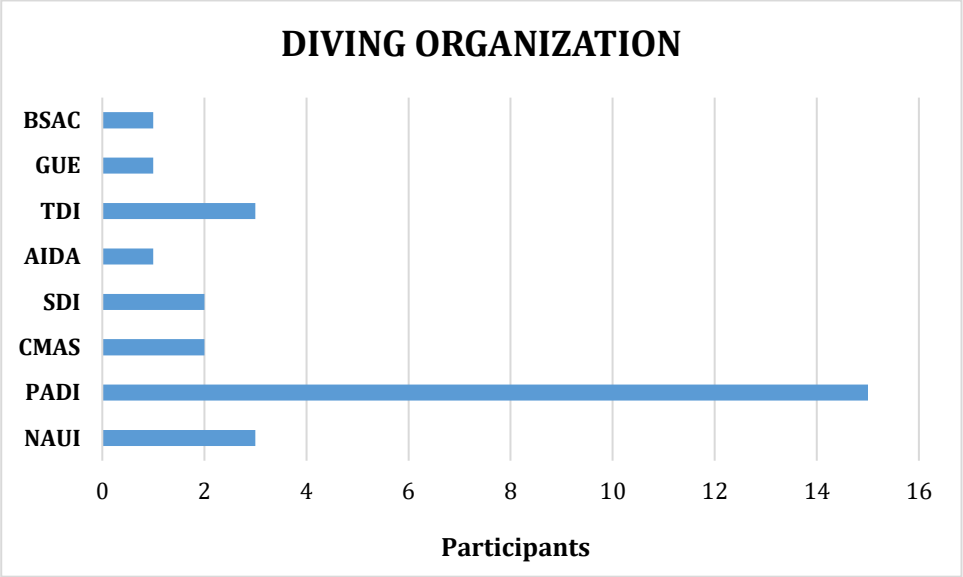
### 2.9.2 Scuba diving profile

Regarding the first question of the scuba diving profile, whether or not the participants worked in the scuba diving industry, half of them did and half did not. One participant was not a scuba diver, thus left their answers to these questions empty. For this reason, the sample size for the following questions was 19 instead of 20.



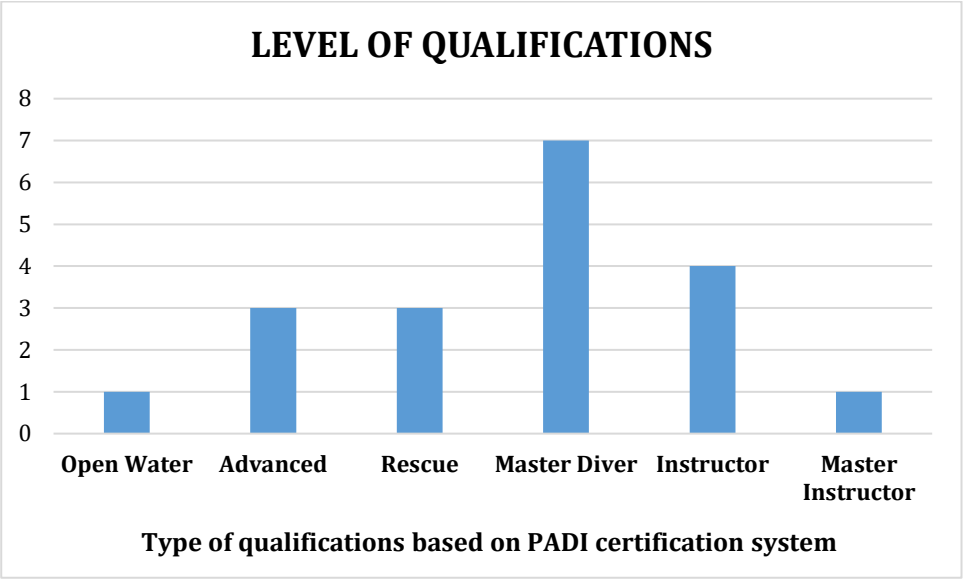

**Graph 6:** The year the participants started diving

As you can see from Graph 6 above, 1 participant started diving in the 70s, 1 during the 80s, 5 during the 90s, 8 during the 00s and 4 during the 10s. Regarding the question on the diving organizations the participants were trained to, some participants had given multiple answers. As you can see from Graph 7 below, 1 participant had declared that BSAC was their diving organization, 1 that was GUE, 3 that was TDI, 1 that was AIDA, 2 that was SDI, 2 that was CMAS, 3 that was NAUI and the majority of them (15 out of 19) declared PADI as their diving organization.

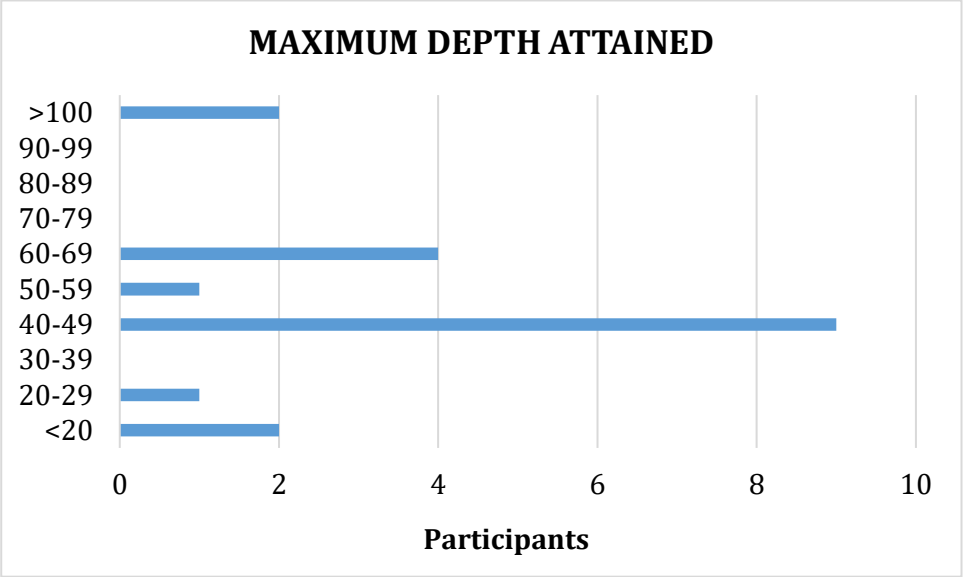



**Graph 7:** The diving organization of the participants

Regarding the diving qualifications of the participants, since the majority of them had PADI certifications, a conversion was made to the ones that did not belong to PADI's system of certification, in order to correspond to that system. As you can see from Graph 8 below, most of the participants (7 out of 19) were Master divers, 4 were instructors, 3 were advanced divers and 3 were rescue divers, 1 was an open water diver and one was a master instructor.

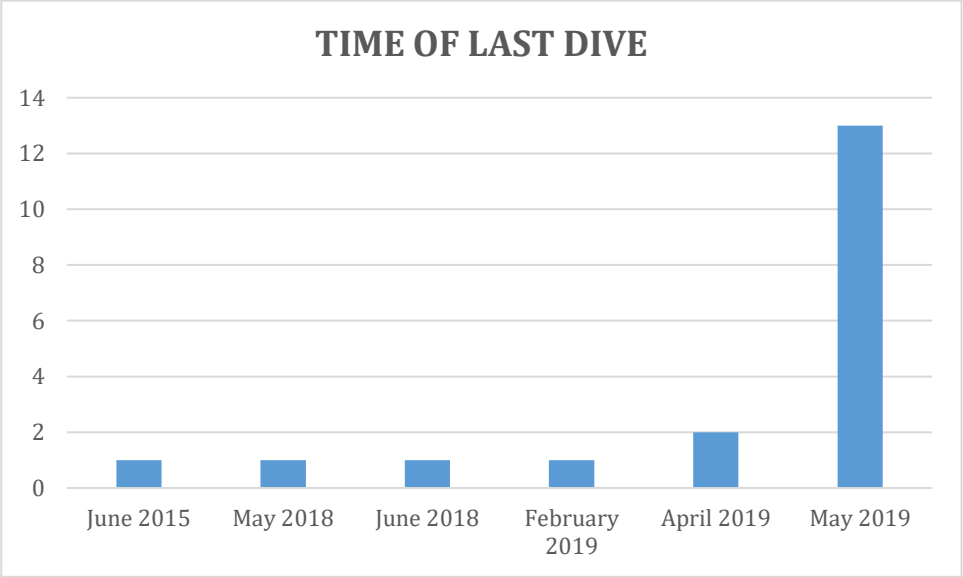



**Graph 8:** The levels of qualification of the participants, based on the PADI certification system.




**Graph 9:** Maximum depth attained during scuba diving by the participants

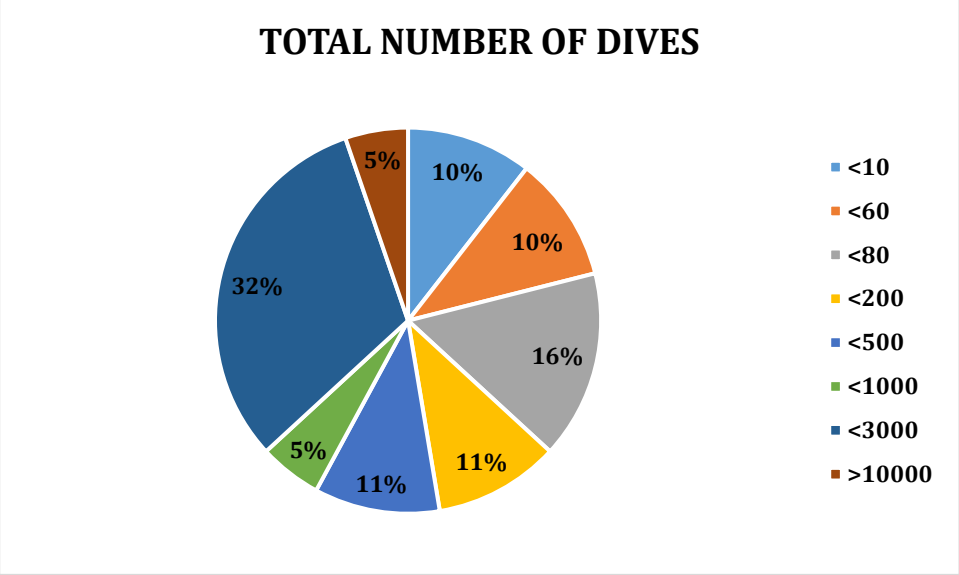
As you can see from Graph 9 above, 2 participants attained less than 20m depth during their diving, 1 less than 30m depth, 9 of them, which was the majority, attained less than 50m, 1 less than 60, 4 less than 70 and 2 more than 100 depth.




**Graph 10:** Time of last dive

As you can see from the Graph 10 above, most of the participants (13 out of 19) went for a dive during May 2019, which was the month of the training seminar. Some of them actually

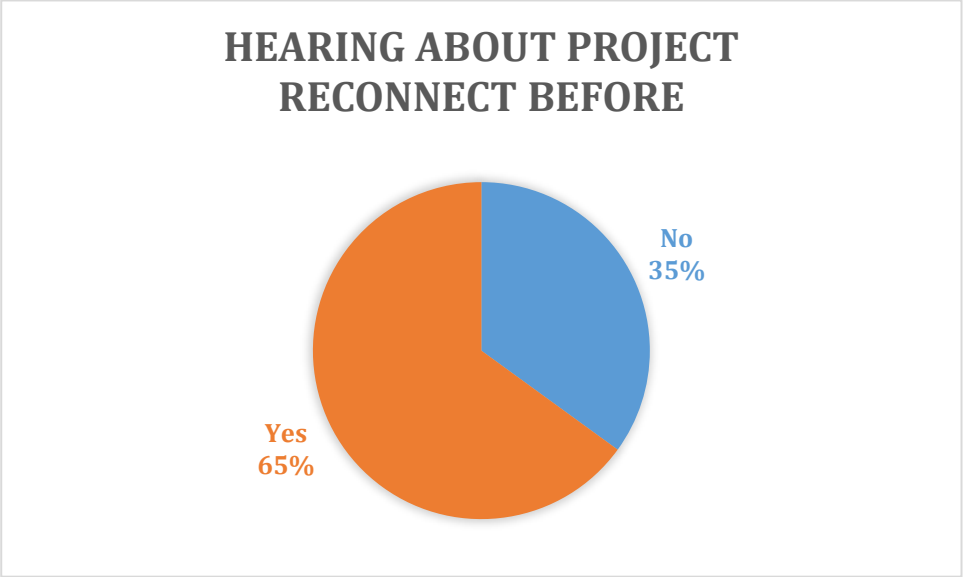
went for a dive on the same date of the seminar. Two participants went for a dive during April 2019, 1 during February 2019, 1 during June 2018, 1 during May 2018 and 1 had "lost touch" with diving, since the last time they dived was during June 2015.



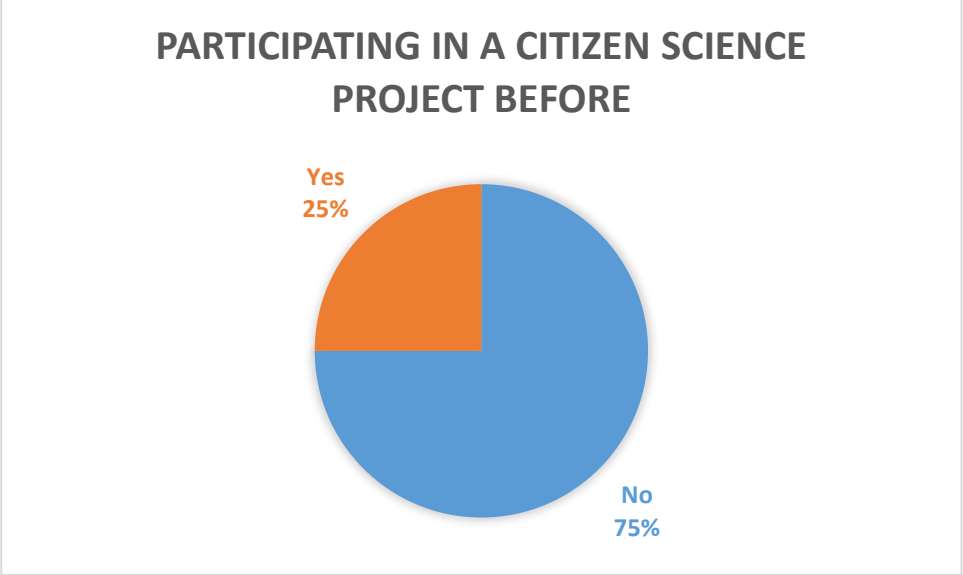

**Graph 11:** Total number of dives of the participants

According to Graph 11 above, 32% of the participants participated in more than 3000 dives. Eleven percent of them had more than 200 dives, 11% more than 500 dives, 10% had less than 10 dives, and 10% less than 60 dives. Sixteen percent had less than 80, 5% had less than 1000 dives, and 1 less than 10000 dives.

The following section of the questionnaire involved questions about the project, the pilot study areas and an analysis on the reasons for participating in the project. As you can see from Graph 12 below, 65% of the participants heard about project RECONNECT before, and 35% did not. Also, as you can see from Graph 13 below, when they were asked whether they participated in a citizen science project before 75% of the participants responded negatively, and 25% of them positively.



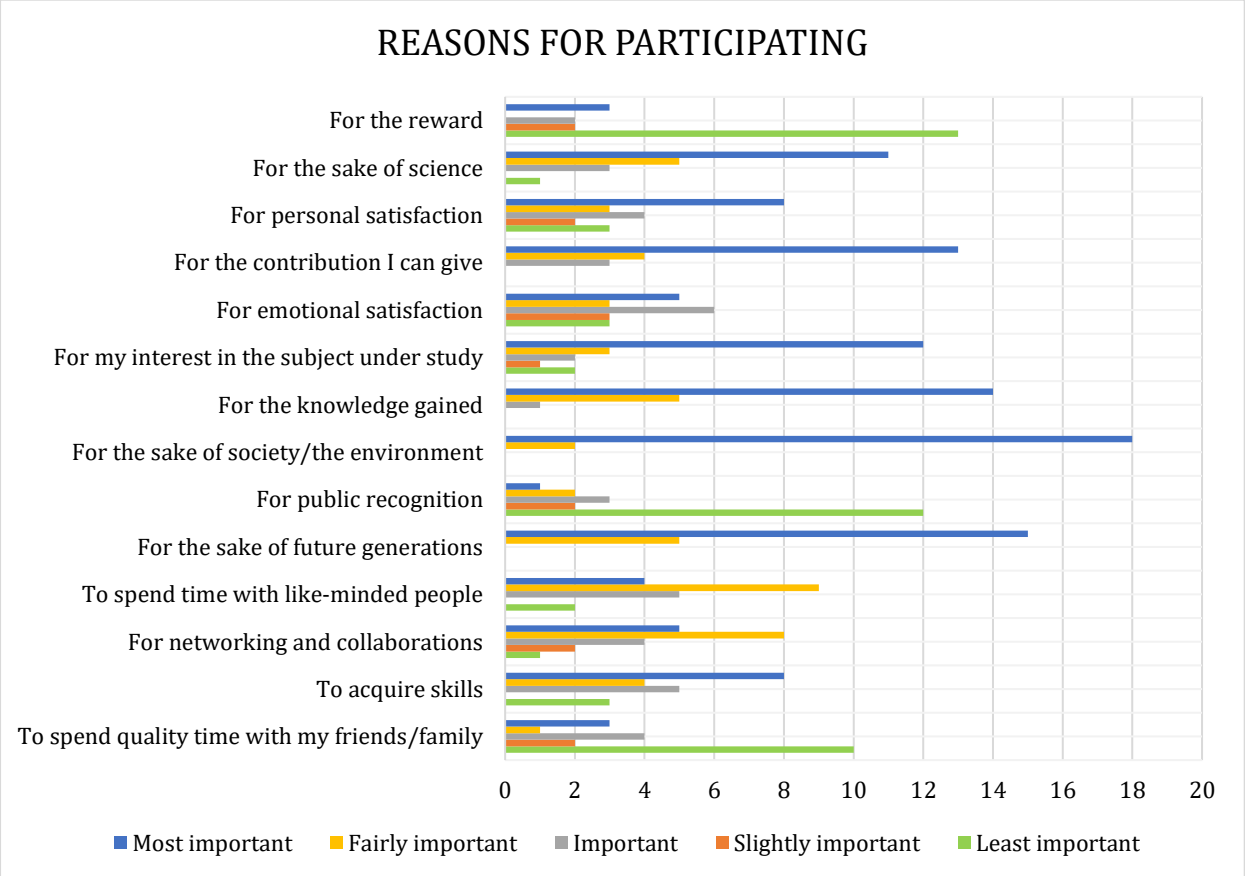

**Graph 12:** The responses of the participants on whether they heard about project RECONNECT before.




**Graph 13:** The responses of the participants on whether they participated in a citizen science project before.

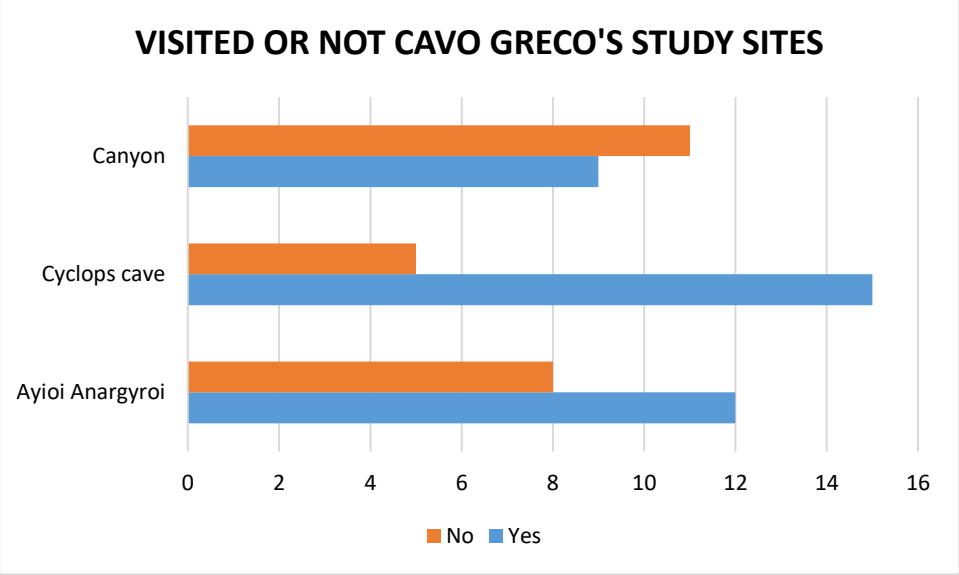
The participants who responded positively in Graph 13, they said they previously participated in project RELIONMED, in REEF CHECK and other similar projects.

At question 3.3 the participants were asked to rate a number of different reasons for participating in project RECONNECT, stating 1 as the least important and 5 the most important reason. As you can see from Graph 14 below, 13 out of 20 people said that joining this project for the reward was the least important reason. Other reasons that didn't apply to the majority of the participants were joining for public recognition, or for spending quality time with friends or family. The majority of them (18 out of 20) said that the most important reason was joining for the sake of society and the environment. Other reasons which were considered important for the participants were joining for the sake of future generations, for the knowledge which will be gained, for the contribution they could give, for their personal interest in the subject under study, for the sake of science, for personal and for emotional satisfaction.



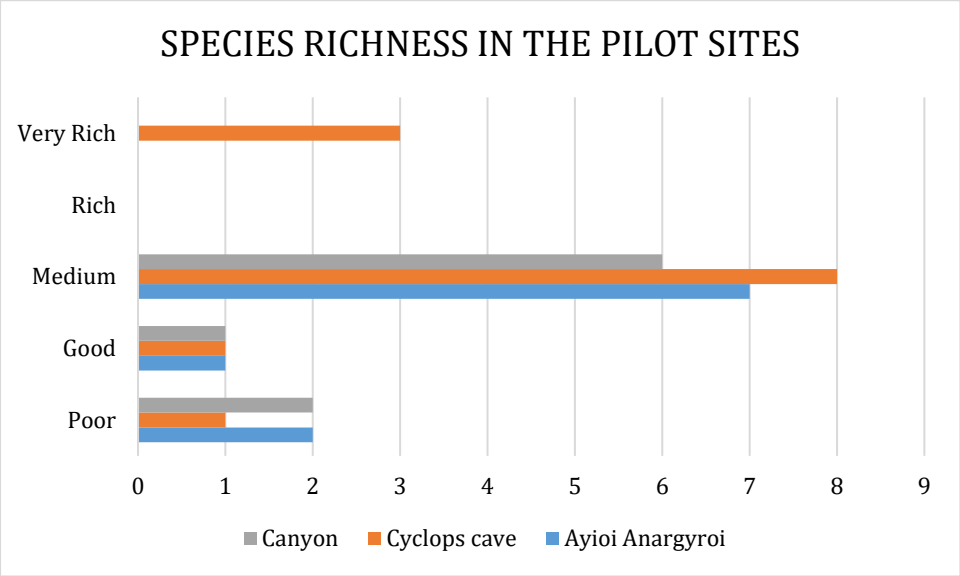

**Graph 14:** The reasons for participating in project RECONNECT as graded by the participants. One was chosen for the least important reasons and 5 for the most important ones.

Regarding whether they ever visited the pilot study areas (Ayioi Anargyroi, Cyclops cave and Canyon) in Cavo Greco, 75% of the participants responded positively and 25% of them responded negatively. Additionally, when the participants were asked specifically which of the study sites of project RECONENCT have visited before, 15 out of 20 said that they visited Cyclops cave. As you can see from Graph 15, Cyclops cave is considered one of the most visited sites for scuba diving, thus this response was expected. Twelve out of 20 also said that they visited Ayioi Anargyroi site before. Regarding Canyon site, only 9 out of 20 responded positively. This reflects to the fact that Canyon is not a highly accessible site, and only highly experienced divers go there for diving. The following question on the number of visits they had to these sites was not that successful since the majority of the participants left it unanswered. Some participants stated 10-30 times, others 500 and even 1000 times. Regarding the regularity of their visits, that questions was also not answered successfully, since the questionnaire didn't specify the range of regularity. Some participants said that they visited the sites, 3-4 times per week, others replied by saying often or not that often. For this reason, a graph for questions 3.4.b and 3.4.c were not created.




**Graph 15:** The participants' response on whether they visited or not Cavo Greco's study sites.

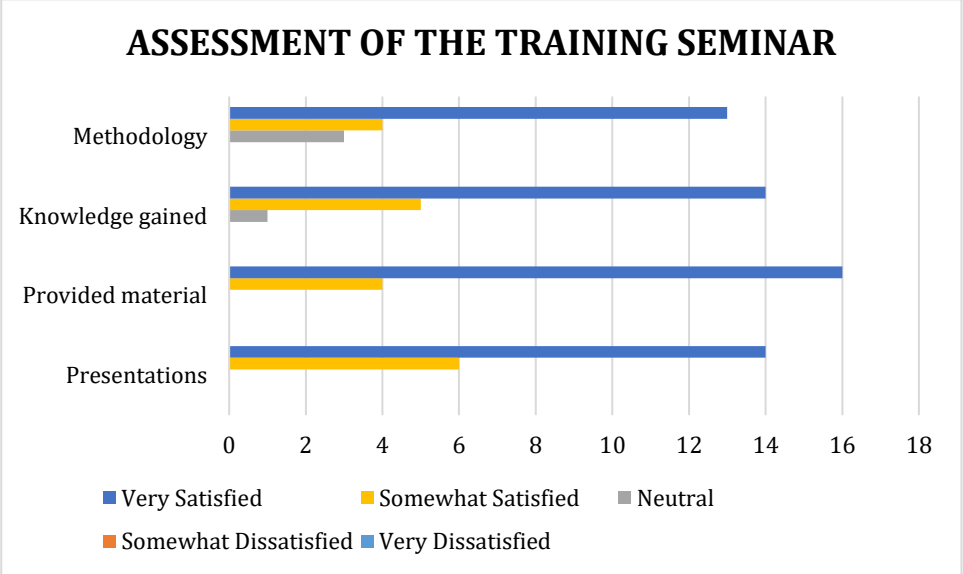
Regarding the question on whether they were planning to visit these sites during the summer season, all the participants replied positively. The participants were additionally asked to evaluate the species richness of the 3 pilot study sites. Unfortunately, not all the participants replied this question. Only 10 participants graded the species richness in Ayioi Anargyroi, 13 for Cyclops cave and 9 for Canyon. As you can see from Graph 16, the majority of the participants (8 out of 13) said that Cyclops cave had a moderate species richness and 3 said that it had a very rich species richness. Canyon and Ayioi Anargyroi sites were also graded as having a moderate species richness, with 6 out of 9 and 7 out of 10 respectively answering this question.




**Graph 16:** The study sites' species richness according to the participants responses.

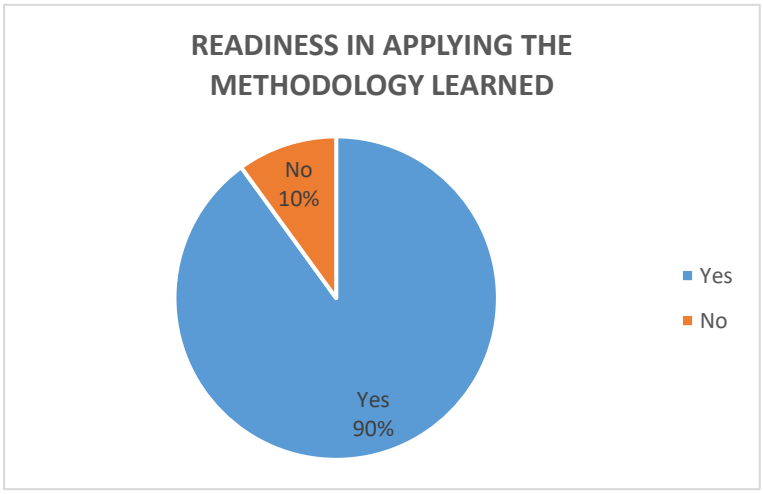
The following section was a basic assessment of the training seminar and an assessment on the participants' understanding on the lecture regarding the best diving practices. As you can see from Graph 17 below, the majority of the participants (13 out of 20) thought that the methodology was very satisfied, 4 thought that it was somewhat satisfied and 3 considered it neutral. Fourteen participants thought that the knowledge gained was very satisfied, 5 that it was somewhat satisfied and 1 thought it was neutral. Regarding the provided material, 16 participants thought it was highly satisfied and 4 that it was somewhat satisfied. Finally,

regarding the presentations, 14 participants thought that they were very satisfying and 6 thought they were somewhat satisfying.




**Graph 17:** The assessment of the training seminars according to the participants opinion.

The participants were also asked whether they were ready to use the methodology they learned in the seminar during their diving at the pilot study sites. Most of them (90% responded positively and only 10% replied negatively (Graph 18).

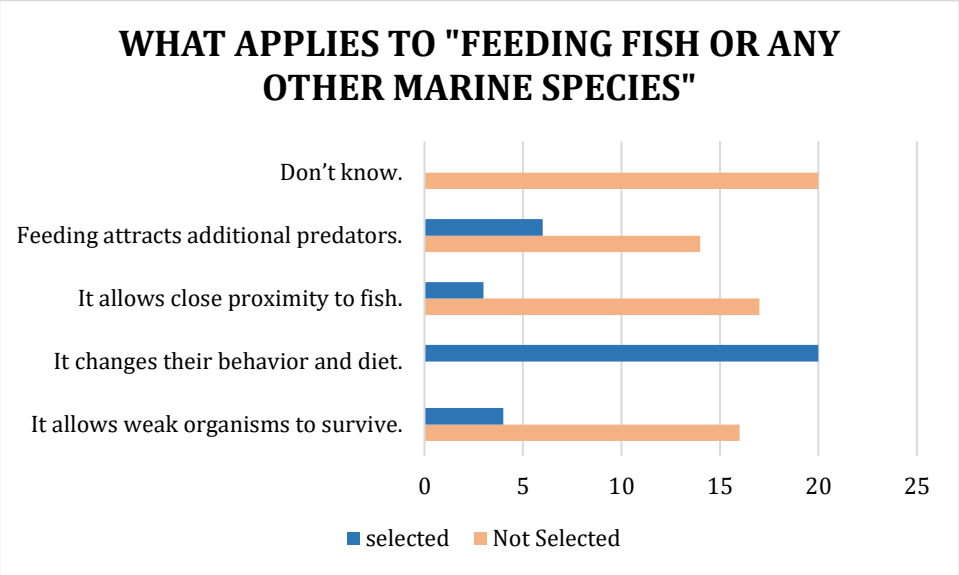



**Graph 18:** The participants' readiness in applying the methodology learned.

The two participants who replied negatively on their readiness said that they weren't sure if they understood all the conditions

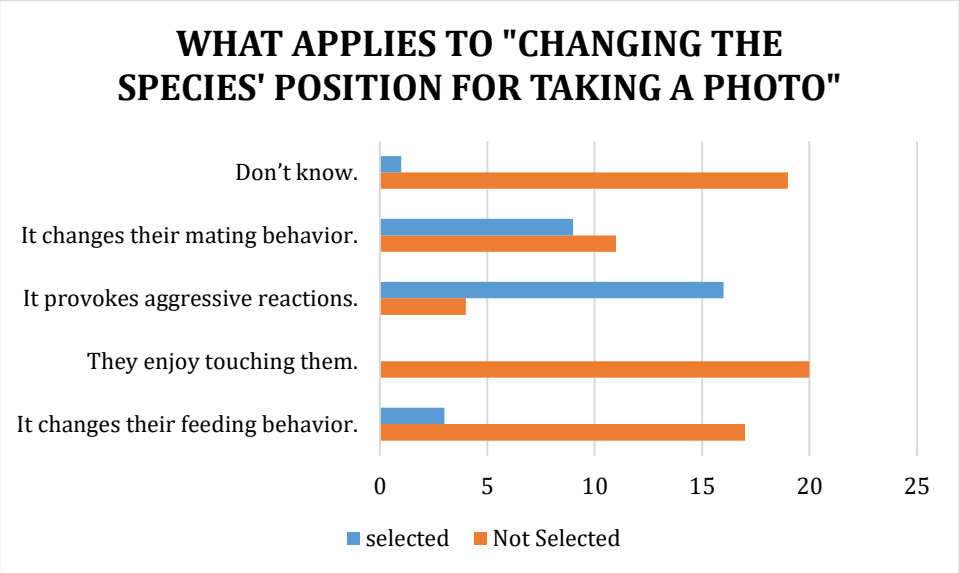
for using the methodology and that they weren't good divers and that they didn't have any photography material. Also, they said that they weren't from Cyprus so they will not be able to apply this methodology, but they could use it in a similar training seminar close to where they lived.

Regarding the best diving practices, and specifically the question on whether divers should be feeding the fish or any other marine species, all the participants replied that such a practice is wrong. As you can see from Graph 19 below, all the participants selected an answer to that question. All of the participants answered that such a practice can change the behavior and diet of the marine species, which was analyzed during the presentations, which was a good finding, since that meant that the participants understood what was explained to them. Six participants said that feeding can attract additional predators which was indirectly explained to them through saying that such practice can alter the ecosystem's food web. Overall the responsiveness to this question was very encouraging.



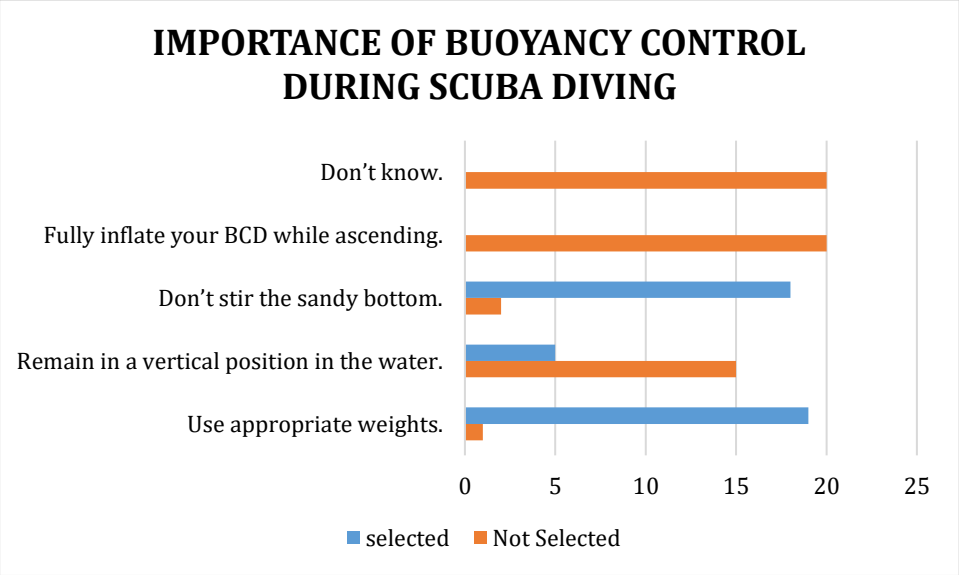

**Graph 19:** What the participants believed that applied as the consequence of the practice of feeding marine species.

Regarding the second question on whether changing the position of marine species for taking the perfect photo was a correct practice or not, 100% of the participants replied negatively. As you can see from Graph 20 below, only 1 participant replied that they didn't know how such a practice could affect the marine species. All the participants said that they should avoid touching the marine species. Also, 16 out of 20 participants said that this could provoke aggressive reactions which was actually analyzed in the presentations. Nine participants selected that this could change the mating behavior of the marine species and 3 that this could affect their feeding behavior. Such effects could be true in reality but weren't analyzed in the presentation. Overall, again the participants responded excellently showing they understood what was presented to them.




**Graph 20:** The participants' opinion on how could marine species be affected when they were changed positions for taking photos.

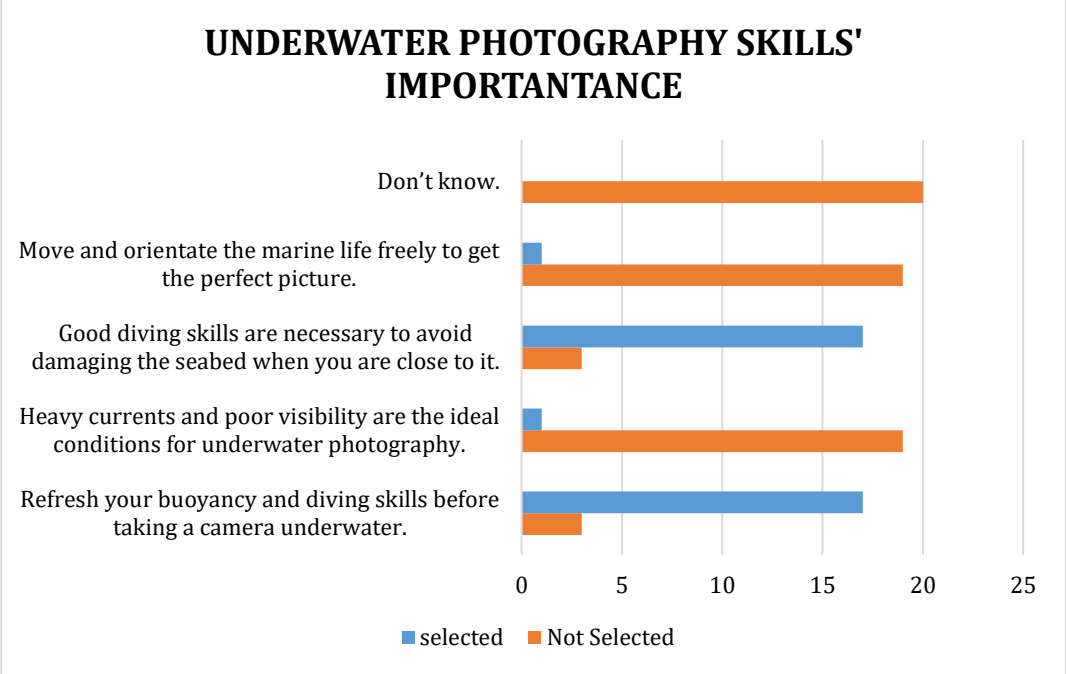
Regarding the question on the buoyancy control, all the participants replied that good buoyancy control is important during diving. As you can see from Graph 21 below, all the participants replied this question by choosing an option, except the one that said that you should fully inflate their BCD while ascending. This option was based on the technicality of scuba diving and their response is what should have been, since you should never inflate the BCD during ascension. The rest of the responses were all correct, and these details were mentioned in the presentations as good practices for achieving zero buoyancy balance. Nineteen participants said that appropriate should be used, 18 said that the sandy bottom should not be stirred and 5 said that they should remain at a vertical position in the water. Their responsiveness was again characterized excellent.




**Graph 21:** Importance of a good buoyancy control during scuba diving.

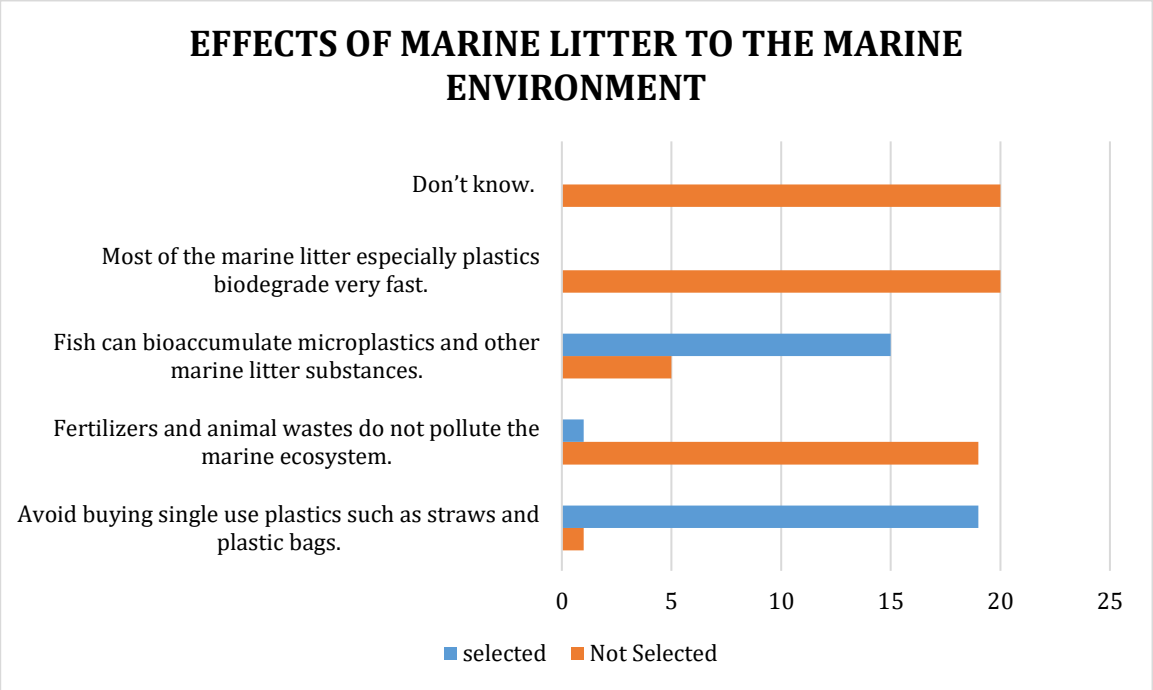
Regarding the question on whether a diver photographer should be sufficiently skilled so that underwater photography would remain a reasonably safe activity, 90% of the participants responded positively and 10% of them responded negatively. As you can see from Graph 22 below, all the participants replied to this question as well. Seventeen out of 20 participants said that good diving skills are necessary to avoid damaging the seabed while close to it. The same amount of people said that you should refresh the buoyancy and diving

skills before taking a camera underwater. These two options were considered the correct ones, based on what was presented to the participants, thus their response was considered great. Only 1 participant said that you should orientate the marine life freely to get the perfect pictures, and that heavy currents and poor visibility are the ideal conditions for underwater photography.




**Graph 22:** The importance for scuba divers in being sufficiently skilled in underwater photography in order for it to remain a safe activity.

Last but not least, all participants replied positively on whether marine litter disposed by human activities could pollute the marine ecosystem. More specifically, as you can see from Graph 23 below, 19 out 20 participants said that they should avoid buying single use plastics such as straws and plastic bags, and 15 said that fish could bioaccumulate microplastics and other marine litter substances. Unfortunately, 19 out of 20 participants replied that fertilizers and animal wastes do not pollute the marine ecosystem, which is not correct, since they could cause some negative effects. However, this wasn't analyzed in the presentations, thus the participants were somehow excused.




**Graph 23:** The consequences of marine litter to the marine environment.

### 2.10 Additional Citizen Science Trainings in Cyprus

Ms. Melina Marcou from the Department of Fisheries and Marine Research informed the Department of Biological Sciences of the University of Cyprus of the upcoming meeting of the PADI Members. Through her encouragement DBS-UCY's team contacted the president of the PADI Member Forum, Mr. Sascha Engeler and requested to allow half an hour in the end of the forum for introducing their diving instructors to RECONNECT's citizen science initiative. They accepted and DBS-UCY's team was represented by their external expert, AP Marine Environmental Consultancy Ltd.

Mr. Antonis Petrou, who is the director of AP Marine Ltd, participated in the PADI Member Forum, which took place on Friday 24th May 2019, at the Grecian Park hotel, in Cavo Greco. During this Forum, Mr. Petrou had the invaluable opportunity to explain to the participants the importance of citizen science and how can divers contribute towards our efforts for better management and protection of the MPA of Cavo Greco. Mr. Petrou explained the simple methodology which the observers will need to follow, as well as some best diving practices for the protection of the marine environment. Present at the meeting were Ms. Melina Marcou who took the photos provided below and Dino Protopapas from the Management Agency of Dodecanese Protected Areas who happened to be there as well.


**Image 44:** Mr. Antonis Petrou at the PADI Member Forum, presenting the citizen science actions of project RECONNECT.

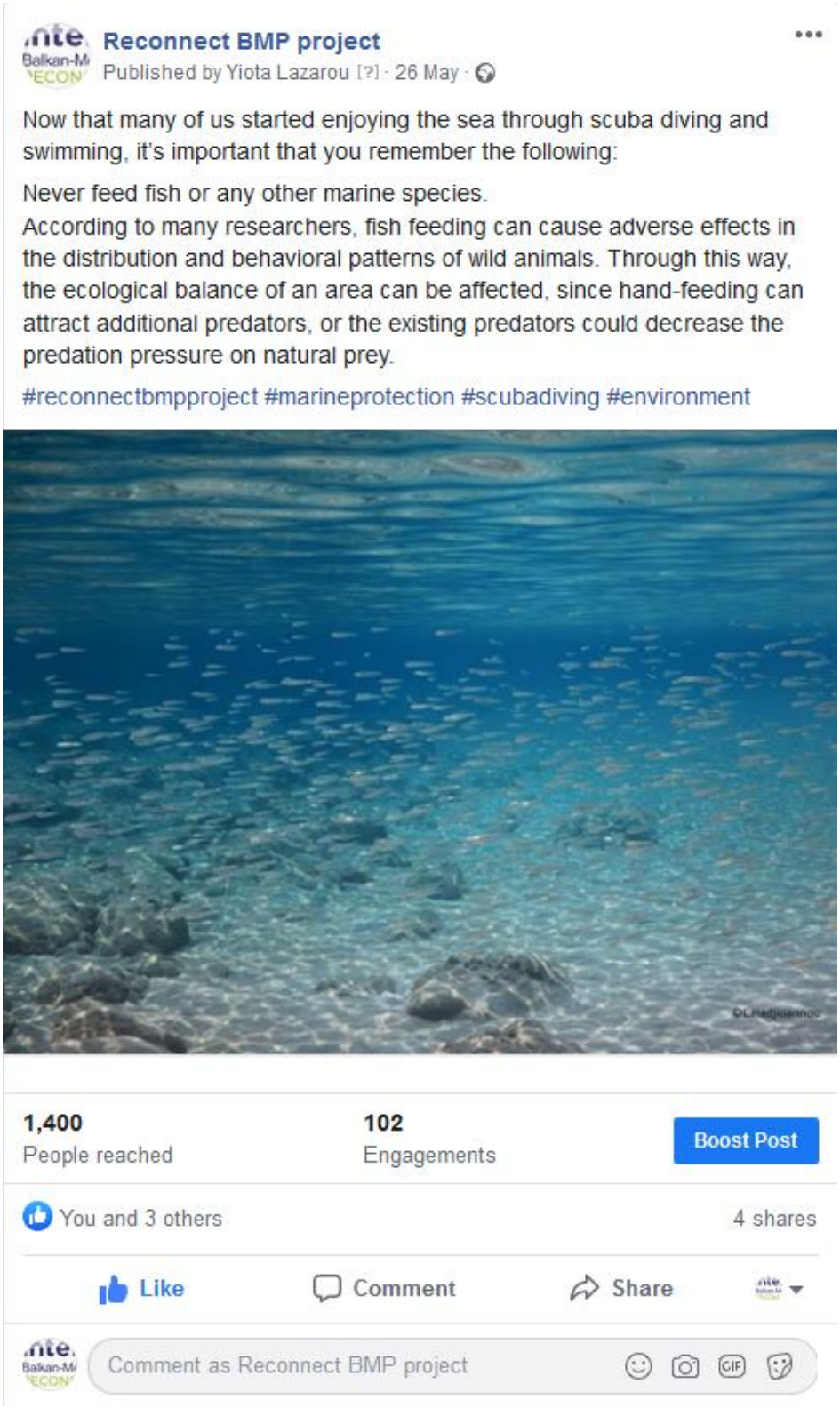

**Image 45:** Mr. Antonis Petrou at the PADI Member Forum, presenting the citizen science actions of project RECONNECT. Mr. Petrou is holding the citizen science flyer.

**Image 46:** Mr. Antonis Petrou at the PADI Member Forum, presenting the citizen science actions of project RECONNECT. Mr. Dino Protopapas from the Management Agency of Dodecanese Protected Areas happened to be there as well. Mr. Protopapas is demonstrating the citizen science posters.


**Image 47:** Mr. Antonis Petrou explaining the placement of the permanent quadrats and the need of their continuous recordings by the citizen scientists.

### 2.11 Posts in Social Media for engaging the interest of citizen scientists

In order to further engage the citizen scientists in participating at this initiative the Department of Biological Sciences of the University of Cyprus proceeded to the creation of a series of posts dedicated to the importance of citizen science in a near daily frequency during the last week of May 2020. Also, the Department of Fisheries and Marine Research sent to DBS-UCY already prepared texts and photos for a series of posts to RECONNECT's Facebook page, which were dedicated to Cavo Greco Marine Protected Area, the selected species (*Posidonia oceanica* and vermetid reefs), as well as the 3 study areas selected in cape Greco. Posts for the promotion of the citizen science training seminar are also presented here.


Reconnect BMP project
Published by Yiota Lazarou [?] · 26 May ·
Now that many of us started enjoying the sea through scuba diving and swimming, it's important that you remember the following:
Never feed fish or any other marine species.
According to many researchers, fish feeding can cause adverse effects in the distribution and behavioral patterns of wild animals. Through this way, the ecological balance of an area can be affected, since hand-feeding can attract additional predators, or the existing predators could decrease the predation pressure on natural prey.
#reconnectbmpproject #marineprotection #scubadiving #environment
1,400
People reached
102
Engagements
Boost Post
You and 3 others
4 shares
Like
Comment
Share
Comment as Reconnect BMP project

**Reconnect BMP project** is feeling thoughtful.
Published by Yiota Lazarou [?] · 27 May ·

Rule of the day!
Do not rest or stand on substrate!
Trampling affects the fauna associated with marine algae and seagrasses. Human disturbance may cause negative impact in densities and coverage of sessile invertebrates.

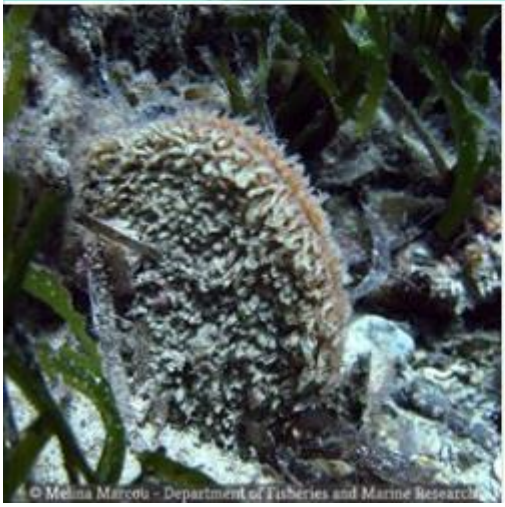
Also, avoid touching, handling, stalking or harassing marine life! Marine turtles have been noticed to release their eggs in the sea, instead of laying them on sandy beaches, after being disturbed by humans during multiple nesting attempts. Also, divers may unintentionally injure stony corals and other sessile benthic organisms by breaking their skeletons and abrading their tissues.

#reconnectbmpproject #balkanmediterranean #scubadiving #marine #protection #citizenscience

**Reconnect BMP project** is feeling motivated.
Published by Yiota Lazarou [?] · 29 May at 11:06 ·

Rule of the day!
Take #photos carefully!
Many sea creatures are fragile, regardless of their size and inappropriate photographic equipment can damage sensitive marine life if it touches them. Keep swim fins, cameras, cylinders and even your hands well away from your subject.
Also, you should avoid resting on the substrate, in order to get the perfect shot!
Many #marine animals are easily stressed, and these actions can cause changes in their feeding and mating behavior or provoke aggressive reactions.

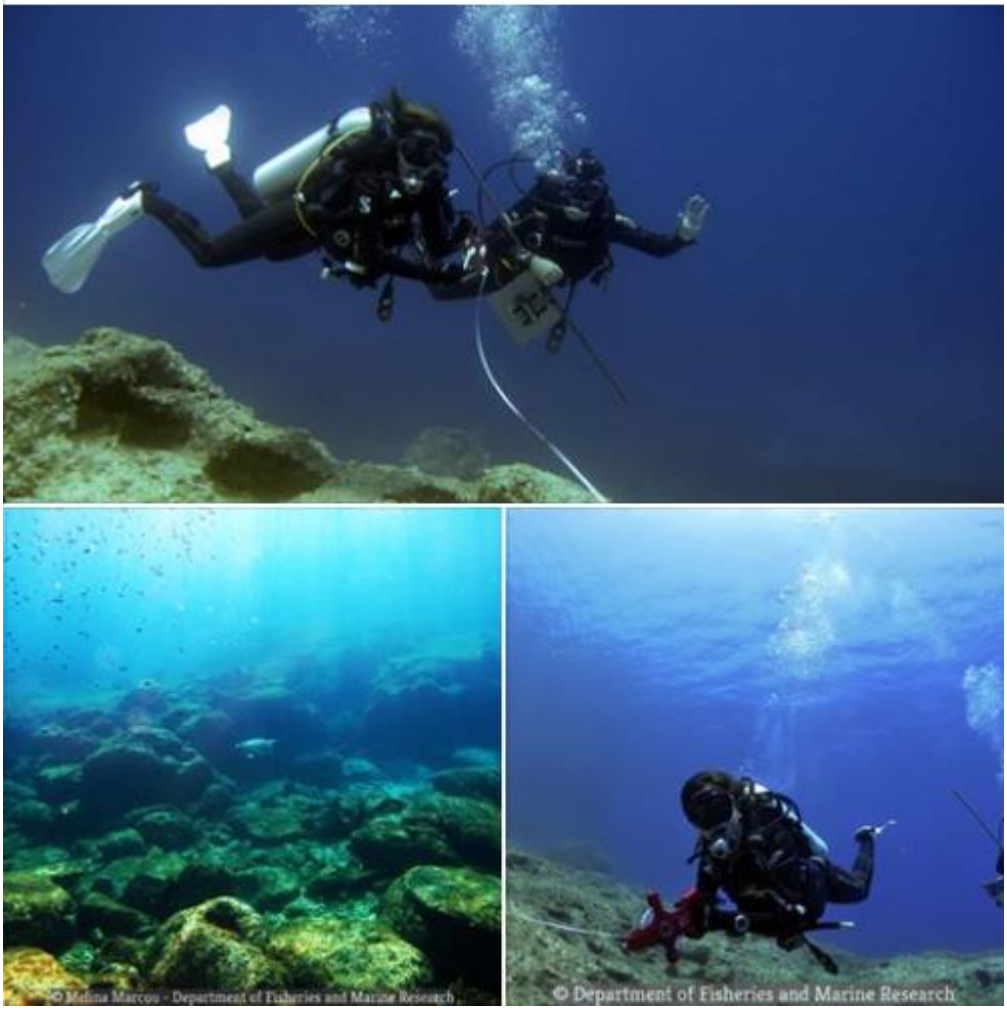
#reconnectbmpproject #environment #underwater #photography #scubadiving



**Reconnect BMP project** is feeling inspired.
Published by Yiota Lazarou [?] · 30 May at 14:30 ·

The importance of citizen science!
The principal behind citizen science is to use the power of collaborative #volunteer #research to explore or collect huge data sets. #Citizen #science enables participants to make a direct contribution to research, increase their scientific understanding, and immerse themselves deeply afield in learning about environmental issues.
Through their participation the citizens spend their time having fun, exploring a subject of their interest, gain valuable knowledge and experiences and feel pleased for their contribution to a common goal, the #protection of #environment.

#reconnectbmpproject #balkanmediterranean #citizenscience



**Reconnect BMP project** is feeling motivated.
Published by Yiota Lazarou [?] · 31 May at 19:35 ·

You can help! Become a citizen scientist.
Follow the directions included in the poster and help further protect the beautiful Marine Protected Areas which were chosen as pilot sites in the project RECONNECT.

#citizen #science #reconnect #protect #marine #environment #balkanmediterranean


**2,411** People reached
**194** Engagements
Boost Post

You and 11 others
12 shares

Like Comment Share

Comment as Reconnect BMP project

**Reconnect BMP project** is feeling fantastic.
Published by Yiota Lazarou [?] · 17 May 2019 ·

The Citizen Science Training Seminar at Cavo Greco was a success. It was an amazing opportunity to talk with interested citizens who want to contribute towards our efforts for the protection and management of the marine environment.

Thank you all for coming.

#marineprotection #citizenscience #cavogreco #diving Reconnect BMP project

**Reconnect BMP project**
Published by Maria Rousou [?] · 16 May 2019 ·

Starting now. Join us!!!!
Photos are continuously being updated! Keep in touch!

Citizen Science Training Seminar
Cavo Greco Environmental Information and Education Centre



Reconnect BMP project
Published by Maria Rousou [?] · 16 May 2019 ·
Join us at the Citizens Science Training Course in Cavo Greco!
97
People reached
11
Engagements
Boost Post
You and 7 others
Like
Comment
Share
Comment as Reconnect BMP project


Reconnect BMP project
Published by Maria Rousou [?] · 8 May 2019 ·
Join us!!!
Please register at
https://docs.google.com/.../1FAIpQLScwi_IgbWvF2pFN6J.../viewform
Reconnect BMP project Relionmed-Life
Interreg
Balkan-Mediterranean
RECONNECT
Regional cooperation for the
transnational ecosystem sustainable development
Citizen Science Training Seminar
Thursday 16th May 2019
15:00-18:00
THU, 16 MAY 2019
Citizen Science Training Seminar
Environmental Information and Education Centre of Cavo...
Going
Christina, Maria and 4 friends
48
People reached
4
Engagements
Boost Unavailable
You and 3 others
Like
Comment
Comment as Reconnect BMP project

**Reconnect BMP project**
Published by Yiota Lazarou [?] · 4 mins ·

Did you know?

The #Cyclops cave dive site is ideal for all levels of divers as the area morphology follows a gradual increase of depth. The #underwater topography of this area is stunning mainly composed of huge and medium size boulders, forming small caves and crevices creating a multi-dimensional habitat, rich in biodiversity. There is a steep rocky descent to the seagrass #Posidonia oceanica meadows, which are found below 10 m up to >30 m depth, refuging several flora and ... See more


**Reconnect BMP project**

Published by Yiota Lazarou [?] · 24 July 2019 ·

Did you know?

The #Canyon dive site is located at the western boundaries of the #Cavo Greko Marine Protected Area (#MPA) and although a stunning scenery, the entry point is difficult therefore a good fitness level is required or access by boat. It is suitable for entry and advanced level divers. The area is characterised by a steep rocky drop to approximately 10-15 m, followed by sandy expanses intermixed with hard substratum and small patches of the Mediterranean Neptune's seagrass #Posidonia oceanica on the western side. Visiting divers will have the opportunity to see a variety of flora and fauna species such as, porgies, goatfish, damselfish, groupers, sponges, starfish, polychaetes, sea cucumbers and molluscs.

Reconnect BMP project

**Reconnect BMP project**

Published by Yiota Lazarou [?] · 2 May 2019 ·

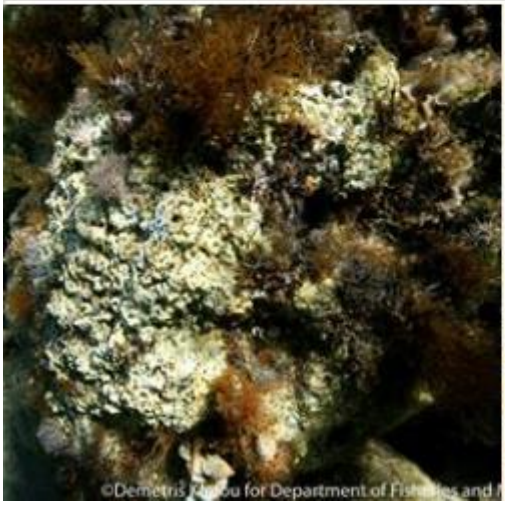
The Ayioi Anargyroi (Chapel) dive site, is located at the far north end of the Cavo Greko Marine Protected Area. The site is accessed by walking man-made steps to the cave underneath the Chapel. Entry into the water is challenging and only possible under calm sea conditions. Once in the water there are many dive routes to take, the most popular is to move to the left bringing you out on the other side of the rock face.
At the entrance side there is a steep descend from 5 to ... See more


**Reconnect BMP project**

Published by Yiota Lazarou [?] · 12 April 2019 ·

#Gastropods belonging to the family #Vermetidae occupy the lower intertidal zone around the #Cavo Greco MPA, where favourable conditions for these species prevail. These key species are considered important ecosystem engineers forming highly diverse bioconstructions of high ecological importance, referred to as #Vermetid Reefs. They provide protection from coastal erosion, regulate the transport of sediment, act as a carbon sink, provide habitat for fish and invertebrates, and greatly enhance marine biodiversity. Vermetid reefs are strictly #protected and included in the Annex II of the Bern convention and in the Annex II of the Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean of the Barcelona Convention.

Reconnect BMP project



**Reconnect BMP project** is feeling challenged.
Published by Christina Pouzaringolos [?] · 30 January 2019 ·

Pinna nobilis is a fan mussel that grows in Posidonia oceanica meadows and sandy areas around the Mediterranean. It is a large bivalve (average size can be 30-50 cm) that filter-feeds from the water around it. If you look closely you might see that Pinna nobilis has a house guest: a small shrimp that lives inside the shell and warns it of threats, causing it to clamp shut for protection. Pinna nobilis was an important edible species in Roman/Greek times and is also the origin of sea silk but has become severely endangered due to pollution, fishing, incidental trawling and declines in seagrass meadows. Recently, a mortality event of the "noble pen shell" caused by a parasite infection, which is found mainly in the digestive glands of infected individuals, has raised concerns about the conservation of this fast-declining emblematic species.

#Pinnanobilis #Pinna #nobilis #penshell #fanmussel #Posidoniaoceanica #Posidonia #oceanica #seagrass #meadows #Mediterranean #bivalve #mollusc #shrimp #conservation

**Reconnect BMP project** is in Cyprus.

Published by Christina Pouzaringolos [?] · 23 January 2019 ·

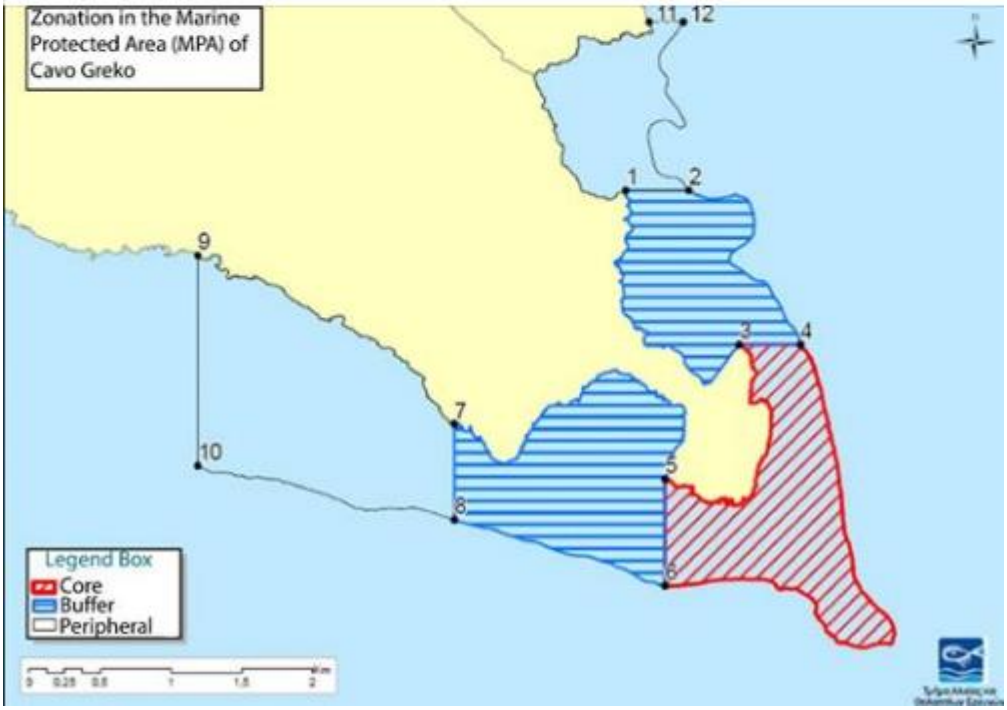
Posidonia oceanica seagrass meadows are the most valuable coastal habitat around Cyprus. Posidonia oceanica is a bioengineer providing food and shelter for hundreds of species.
The meadows are often highly biodiverse and are important nursery grounds for fish. You can find meadows in the shallow waters all around the coast from 0 extending up to 45 m depth in some cases.
Posidonia oceanica is completely absent from neighbouring countries and paradoxically it thrives in the warm waters around the coast of Cyprus. It is very slow growing, expanding only 2-4 cm in a whole year.
Large regressions of the seagrass have been reported around the Mediterranean attributed to dredging and coastal developments, changes in turbidity and sedimentation, pollution, climate change etc. Any regressions are considered irreversible in human time scales thus it is crucial to conserve the last ancient fragmented seagrass population in the Levantine Basin that survives around the island of Cyprus.

#Posidonia #oceanica #Posidoniaoceanica #seagrass #meadows #coastal #Mediterranean #Levantine #Cyprus

**Reconnect BMP project**

Published by Christina Pouzaringolos [?] · 11 January 2019 ·

Did you know that fishing is prohibited in Cavo Greko?
Earlier this year the Ministry of Agriculture, Rural Development and the Environment of Cyprus banned fishing in the newly established Cavo Greko #Marine Protected Area (depths 0 -50 m). Any #fishing activities of any sort are banned from the Core Zone established at the tip of Cavo Greko. Professional fishermen are allowed to fish in the Buffer Zone but recreational fishing activities are not allowed in this zone. The main aim is to conserve fish stocks and marine species. Recreation activities are exempted from any exclusions.



**Reconnect BMP project**
Published by Christina Pouzaringolos [?] · 7 January 2019 ·

Did you know that Cavo Greko is a newly established natural MPA in Cyprus?
Cavo Greko forms part of the #Natura2000 Network and was established as a Marine Protected Area (MPA) in Cyprus on the 22nd of May 2018, the International Day of Biodiversity (#IDB2018). Located between two major tourist locations (Ayia Napa and Protaras) in the south-east of Κύπρος, it has stunning natural views, crystal-clear waters and the land was designated as a National Forest Park in 1993. The area is dotted with #Posidonia oceanica meadows, sandbanks with the #seagrass #Cymodocea nodosa and reefs (boulders, caves...) with vermetid gastropods in the intertidal. Many important species were reported from the area. Legends say it is also home to "To Filiko Teras", the Ayia Napa sea monster... but don't worry it is friendly!


## 2.12 Honoring the citizen scientists of Cyprus

The RECONNECT partnership decided that one of the best ways to honor the contribution of citizen scientists to the project was the inclusion of mini interviews of them in the project's newsletters. One of the citizen scientists who actively participated in the project and recorded the permanent quadrats in Cavo Greco Cyprus was Mr. Yiannos Mylonas. His responses to our questions are presented below, as well as a picture of him taken underwater. Mr. Mylonas was required to fill-in a consent form, following the GDPR guidelines, allowing us to use his replies in our newsletter and in the Facebook page.

1. **How did you learn about the RECONNECT project and decided to be involved in the citizen science initiative?**

   I learned about the RECONNECT project through a social media call. Reading the call caught my attention and I instantly decided to participate, in order to contribute to the programme in any way I could.

2. **What does it mean for you to be a citizen scientist?**

   Participating in this project allowed me to contribute back to the marine environment, by providing information recorded in the pilot sites of the project. This means a lot to me, since I can finally do something more interesting during diving apart from enjoying the beauty of the marine life. I can help our scientists protect the environment in a better way.

3. **How do you value the importance of your contribution towards the protection of the marine environment?**

   Citizen science divers are very important for the marine life research. It can cost a lot of money and time to obtain the required amount of scientific data in a marine project, especially if this is done through hiring external experts. Unfortunately, funds for marine research in Cyprus are limited, thus with their contribution citizen science divers manage to obtain this information in a less expensive way, and help our scientists collect more data in a shorter period of time.

4. **What do you think should change in order to achieve better environmental protection?**

1) More laws must be put in place to better protect the environment.
2) Educate people/divers in environmental concepts.
3) Educate/train divers, and help them obtain a scientific diving qualification, which will make them more aware of the scopes of the science projects and more skilful.

5. **What would you say to other people in order to motivate them to participate in this project?**

We dive for various reasons. Some of us because we love the underwater world, some others do it for the feeling of being surrounded by marine life. If we want to continue enjoying this magnificent world, we need to help our scientists carry out their research and contribute towards protecting the marine environment. Next time you see a citizen science call, go ahead and participate in order to give something back to our seas.

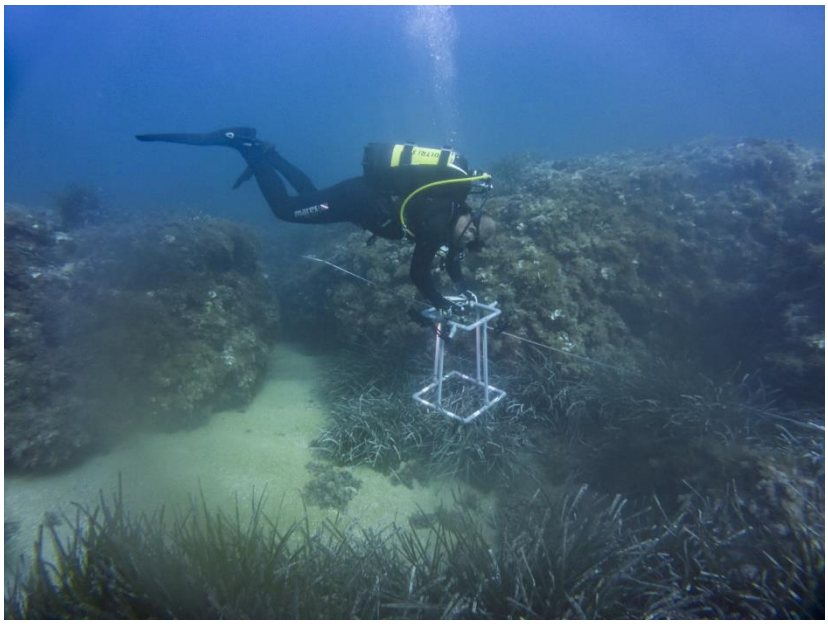


**Image 48:** Mr. Yiannos Mylonas recording marine life with a camera attached to a quadrat.

## Consent form for RECONNECT Citizen Science interview

The RECONNECT project (Regional cooperation for the transnational ecosystem sustainable development), is implemented under the framework of the transnational Cooperation Programme Interreg V-B Balkan Mediterranean 2014-2020, and is co-funded by the European Union and National Funds of the participating countries. RECONNECT project aims to develop a transnational cooperative network for sustainable management of Marine Protected Areas (MPAs) and Natura 2000 sites. The new transnational and holistic approach which will be developed, will change the current protection strategies in the Balkan-Mediterranean area, promoting more efficient and accurate management practices. The main outputs of the RECONNECT project will provide information concerning habitat attributes, as well as the essential biodiversity, socio-economic and cultural variables of the participating countries.

Taking into consideration your valuable participation in the Citizen Science activities, the partnership of project RECONNECT would like to express their gratitude, through dedicating a section of the project's newsletter to you, the model citizen scientists. This newsletter will be disseminated to a list of recipients who have already expressed interest in the project. Also, the partnership wishes to thank you through posting part of your replies, along with your photo, in the social media pages of the project in Facebook and Twitter.
***Respecting the European «GDPR» policy, for the protection of personal data.***

The General Data Protection Regulation (GDPR) which was applied on 25th May 2018, aims to protect the rights of natural persons regarding the processing of their personal data. Considering this policy, you are invited to provide us your consent in publishing your responses and your photo in the newsletter and the social media pages of the project.

Do you give your consent to the partnership of project RECONNECT in publishing your responses and your photo in the newsletter and the social media pages of the project?

YES/NO

Full Name: ……

Date: ……

Signature: ……

# References

Bonney, R., Cooper, C., Dickinson, J., Kelling, S., Phillips, T., & Rosenberg, K. a. (2009). *Citizen science: a developing tool for expanding science knowledge and scientific literacy.* BioScience, 59(11), pp.977-984.

Jennett, C., Kloetzer, L., Schneider, D., Iacovides, I., Cox, A., Gold, M., . . . Ajani, Z. a. (2016). *Motivations, learning and creativity in online citizen science.* Journal of Science Communication, 15(3).

Pocock, M., Chapman, D., & Sheppard, L. &. (2014). *Choosing and Using Citizen Science: a guide to when and how to use citizen science to monitor biodiversity and the environment.* Centre for Ecology & Hydrology.

# 3. APPENDIX 1: THE PRESENTATIONS PREPARED FOR THE TRAINING WORKSHOP, IN CAVO GRECO.

Interreg Balkan-Mediterranean RECONNECT

DEPARTMENT OF FISHERIES AND MARINE RESEARCH (DFMR)

**INTERREG V-B "Balkan-Mediterranean 2014-2020"**
Regional cooperation for the transnational ecosystem sustainable development

**Presenting the RECONNECT project**

***Regional cooperation for the transnational ecosystem sustainable development***

***Citizen Science Training Seminar***
***Cavo Greko 16/5/2019***

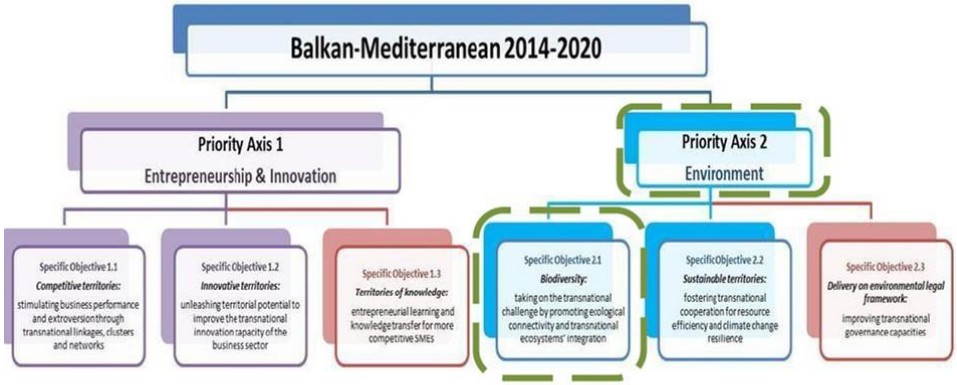
**Maria Rousou**
*BSc, MSc, Phd*
*Department of Fisheries and Marine Research*

Project co-funded by the European Regional Development Fund and the National Funds of the participating countries

Interreg Balkan-Mediterranean RECONNECT

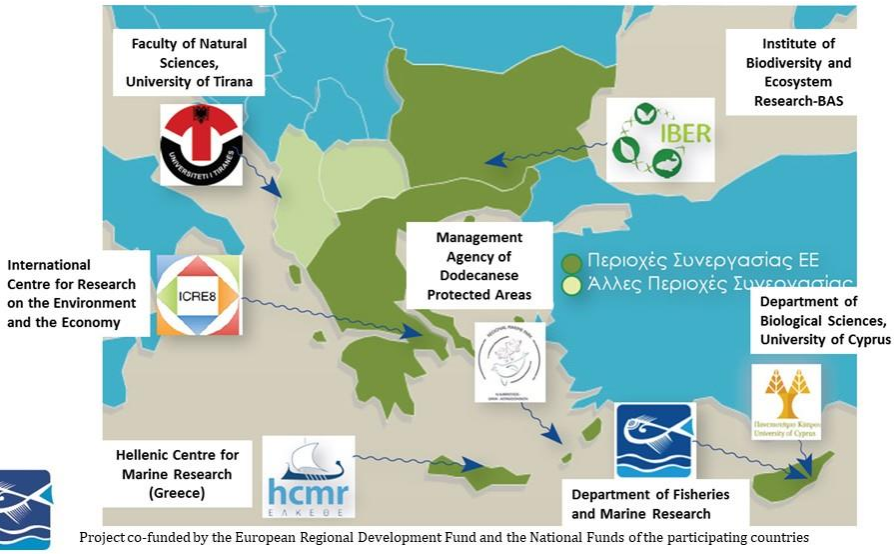
•**Funding :** Interreg 2014-2020, Balkan-Mediterranean

*Priority Axis 2: "Environment"*




Project co-funded by the European Regional Development Fund and the National Funds of the participating countries

•**15/9/17 – 15/9/2019** (~ 6-12 months extension)
•**7 partners/ 4 countries**




Project co-funded by the European Regional Development Fund and the National Funds of the participating countries

• **2 observer partners/ 2 countries**

Mediterranean Institute of marine and terrestrial Biodiversity and Ecology

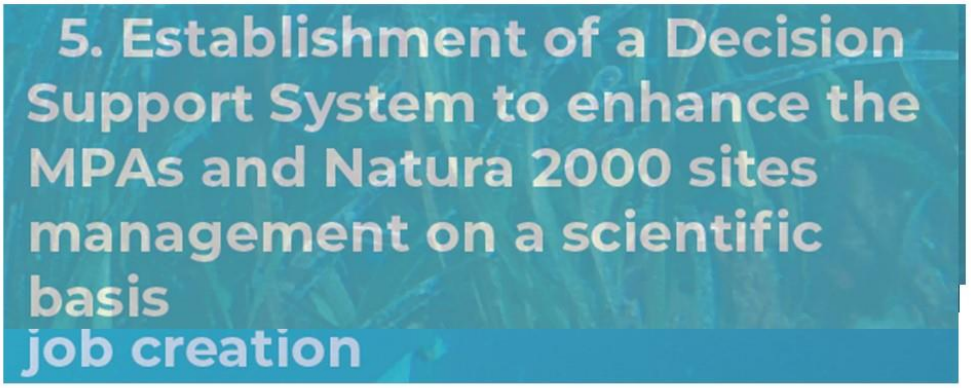
Department of Biological and Environmental Sciences and Technologies, University of Salento

Project co-funded by the European Regional Development Fund and the National Funds of the participating countries

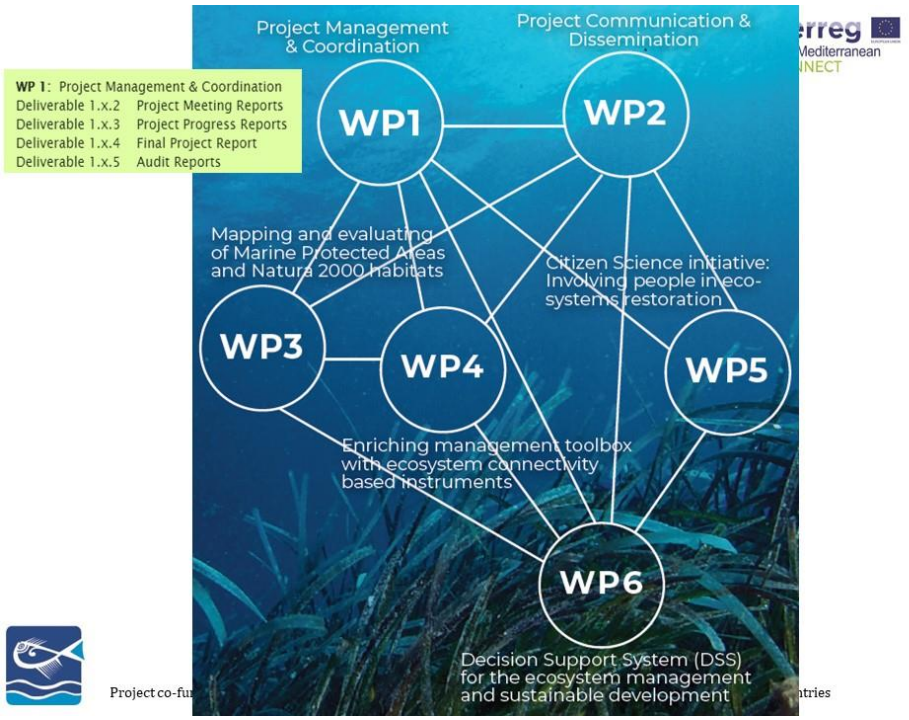

Interreg
Balkan-Mediterranean
RECONNECT
The RECONNECT project will:
3. Provide information for habitat
4. Enhance the competence of
local management authorities
and cultural variables
the Balkan-Mediterranean area


Project co-funded by the European Regional Development Fund and the National Funds of the participating countries


Objectives
Interreg
Balkan-Mediterranean
RECONNECT


5. Establishment of a Decision
Support System to enhance the
MPAs and Natura 2000 sites
management on a scientific
basis
job creation


Project co-funded by the European Regional Development Fund and the National Funds of the participating countries


Project Management & Coordination
Project Communication & Dissemination
WP 1: Project Management & Coordination
Deliverable 1.x.2 Project Meeting Reports
Deliverable 1.x.3 Project Progress Reports
Deliverable 1.x.4 Final Project Report
Deliverable 1.x.5 Audit Reports
WP1
WP2
Mapping and evaluating of Marine Protected Areas and Natura 2000 habitats
Citizen Science initiative: Involving people in eco-systems restoration
WP3
WP4
WP5
Enriching management toolbox with ecosystem connectivity based instruments
WP6
Decision Support System (DSS) for the ecosystem management and sustainable development

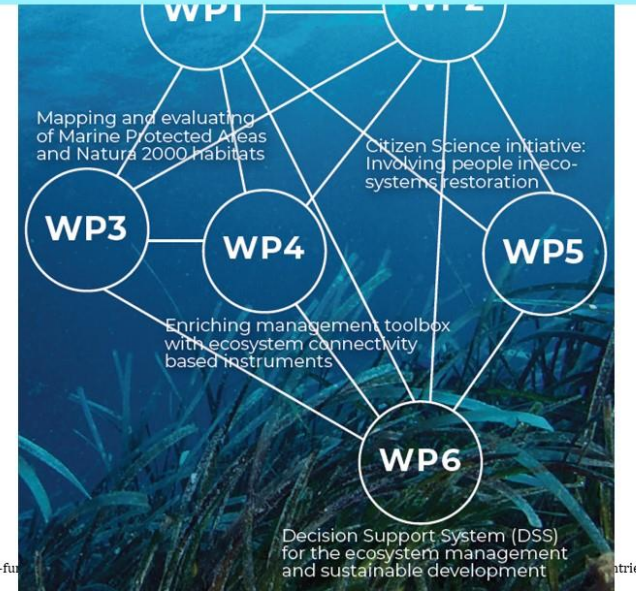

Project Management & Coordination
Project Communication & Dissemination
WP 2: Project Communication & Dissemination
Deliverable 2.x.1 Project identity set
Deliverable 2.x.2 Open days Activities
Deliverable 2.x.3 Workshops on the Decision Support System
Deliverable 2.x.4 Project's website and mobile/tablet application
Deliverable 2.x.5 Publications in scientific journals, participation in conferences
WP2
Regional cooperation for the transnational ecosystem sustainable development.
Open day activity event for the marine environment at the Environmental Centre of Cavo Greko
Agenda

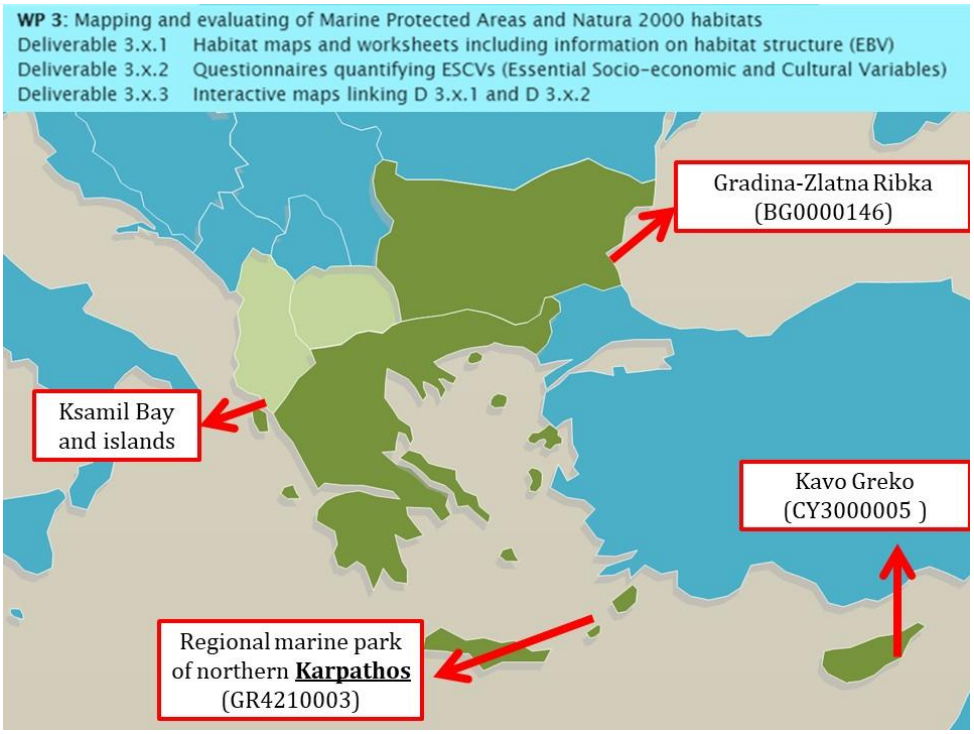



Project co-fu

Project co-fu

WP 3: Mapping and evaluating of Marine Protected Areas and Natura 2000 habitats
Deliverable 3.x.1 Habitat maps and worksheets including information on habitat structure (EBV)
Deliverable 3.x.2 Questionnaires quantifying ESCVs (Essential Socio-economic and Cultural Variables)
Deliverable 3.x.3 Interactive maps linking D 3.x.1 and D 3.x.2

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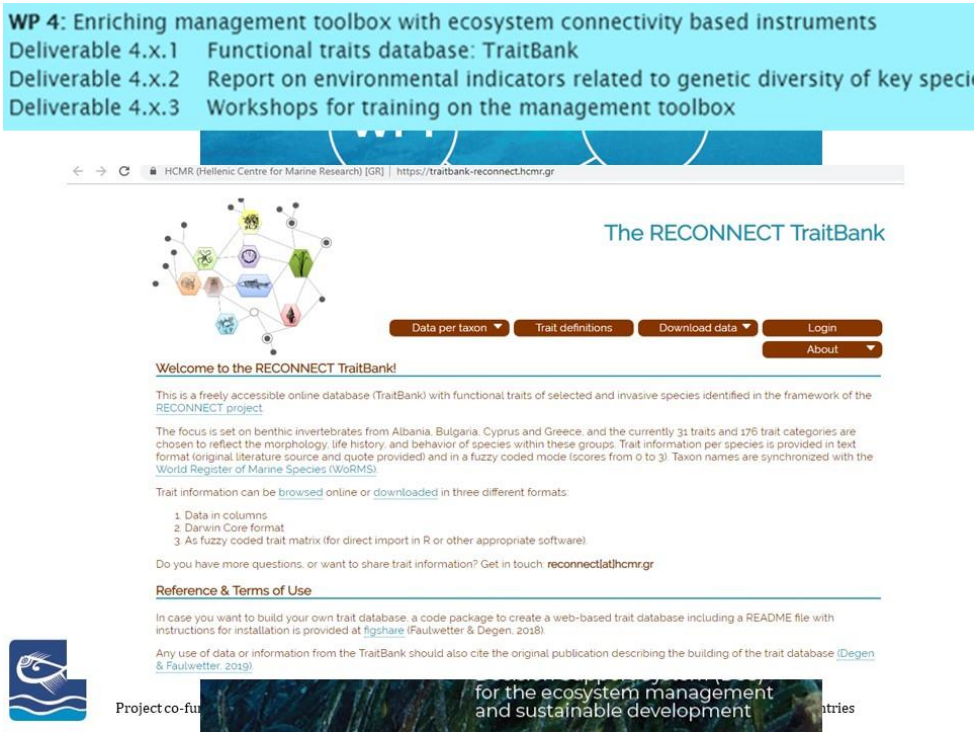
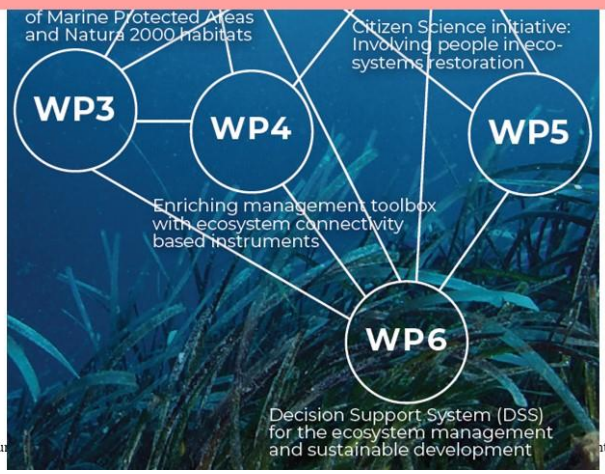
Deliverable 3.x.2 Questionnaires quantifying ESCVs (Essential Socio-economic and Cultural Variables)
Deliverable 3.x.3 Interactive maps linking D 3.x.1 and D 3.x.2
Gradina-Zlatna Ribka (BG0000146)
Ksamil Bay and islands
Kavo Greko (CY3000005 )
Regional marine park of northern Karpathos (GR4210003)


WP 4: Enriching management toolbox with ecosystem connectivity based instruments
Deliverable 4.x.1 Functional traits database: TraitBank
Deliverable 4.x.2 Report on environmental indicators related to genetic diversity of key speci
Deliverable 4.x.3 Workshops for training on the management toolbox
HCMR (Hellenic Centre for Marine Research) [GR] | https://traitbank-reconnect.hcmr.gr
The RECONNECT TraitBank
Data per taxon
Trait definitions
Download data
Login
About
Welcome to the RECONNECT TraitBank!
This is a freely accessible online database (TraitBank) with functional traits of selected and invasive species identified in the framework of the RECONNECT project
The focus is set on benthic invertebrates from Albania, Bulgaria, Cyprus and Greece, and the currently 31 traits and 176 trait categories are chosen to reflect the morphology, life history, and behavior of species within these groups. Trait information per species is provided in text format (original literature source and quote provided) and in a fuzzy coded mode (scores from 0 to 3). Taxon names are synchronized with the World Register of Marine Species (WoRMS).
Trait information can be browsed online or downloaded in three different formats:
1. Data in columns
2. Darwin Core format
3. As fuzzy coded trait matrix (for direct import in R or other appropriate software).
Do you have more questions, or want to share trait information? Get in touch: reconnectlat|hcmr.gr
Reference & Terms of Use
In case you want to build your own trait database, a code package to create a web-based trait database including a README file with instructions for installation is provided at figshare (Faulwetter & Degen, 2018).
Any use of data or information from the TraitBank should also cite the original publication describing the building of the trait database (Degen & Faulwetter, 2019).
Project co-fu
for the ecosystem management and sustainable development
atries

**WP 5**: Citizen Science initiative: Involving people in ecosystems restoration
Deliverable 5.x.1 Creation of best-practice-protocols of monitoring using citizens' activities
Deliverable 5.x.2 Training seminars for the citizen scientists prior to their involvement in the pilot project
Deliverable 5.x.3 Web-based platform and mobile/tablet application for the citizens generated data
Deliverable 5.x.4 Wiki page related to species information including information from D 4.x.1

**WP6**: Decision Support System (DSS) for the ecosystem management and sustainable development
Deliverable 6.x.1 Web-based platform for the Decision Support System
Deliverable 6.x.2 Handbook of management practices




Project co-fu atries

Regional cooperation for the transnational ecosystem sustainable development

Interreg Balkan-Mediterranean RECONNECT

## *Citizen Science Training*
# Agenda

| | |
|---|---|
| 15:00 –15:15 | **Registrations and Coffee Break** |
| 15:15– 15:30 | **Welcome speeches**<br>*Dr. Spyros Sfenthourakis, Professor of Department of Biological Sciences, University of Cyprus* |
| 15:30 – 15:45 | **Presenting the RECONNECT research project**<br>*Dr. Maria Rousou, Department of Fisheries and Marine Research* |
| 15:45 – 16:00 | **Information on the Cavo Greco protected area / Video**<br>*Mr. Chrysostomos Chrysostomou, Forestry Department* |
| 16:00 – 16:30 | **The marine environment of Cavo Greco (RECONNECT)**<br>*Dr. Demetris Kletou, DFMR's external expert*<br>*Marine and Environmental Research (MER) Lab Ltd* |
| 16:30 – 17:00 | **Citizen Science involvement in monitoring the marine environment of Cavo Greco (RECONNECT)**<br>*Mr. Antonis Petrou, UCY's external expert*<br>*AP Marine Environmental Consultancy Ltd* |
| 17:00 – 17:15 | **RELIONMED LIFE: Preventing a LIONfish invasion in the MEDiterranean through early response and targeted Removal**<br>*Mrs Yiota Lazarou, Department of Biological Sciences, University of Cyprus* |
| 17:15-17:30 | **Questionnaire completion and Discussion** |
| 17:30-18:00 | **End of event / Certificates**<br>**Light dinner** |

Project co-funded by the European Regional Development Fund and the National Funds of the participating countries


Project co-funded by the European Regional Development Fund and the National Funds of the participating countries

Interreg Balkan-Mediterranean RECONNECT

INTERREG V-B "Balkan-Mediterranean 2014-2020"
Regional cooperation for the transnational ecosystem sustainable development

# The marine environment of Cavo Greco

**Dr Demetris Kletou**

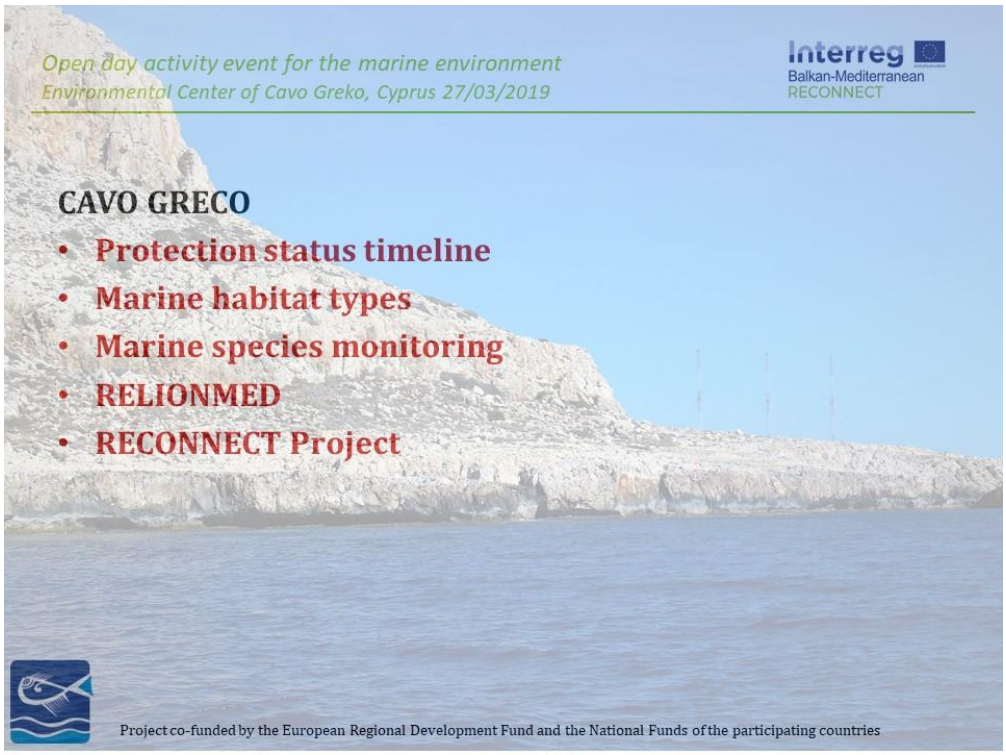
*Marine & Environmental Research (MER) Lab*

*Subcontracted by the*
*Department of Fisheries and Marine Research Cyprus*

DEPARTMENT OF FISHERIES AND MARINE RESEARCH (DFMR)

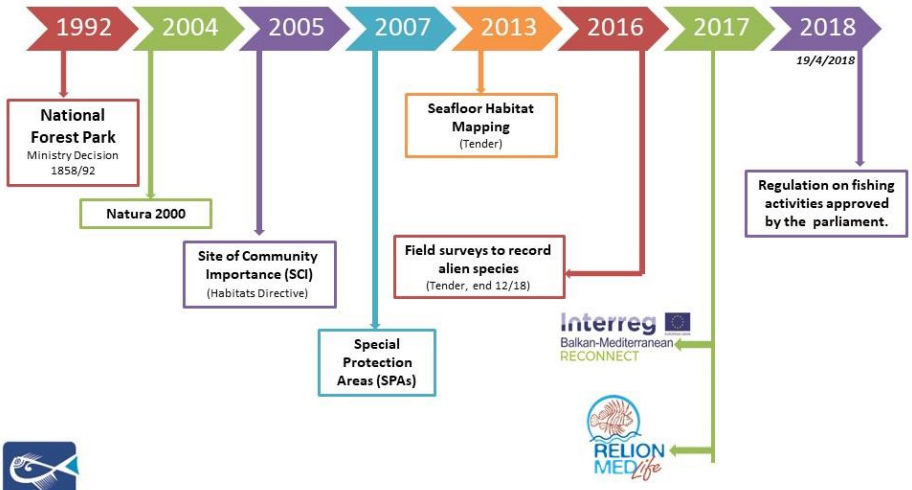
Mer Marine & Environmental Research Lab Ltd

Project co-funded by the European Regional Development Fund and the National Funds of the participating countries



*Open day activity event for the marine environment*
*Environmental Center of Cavo Greko, Cyprus 27/03/2019*

## Background information of Cavo Greco

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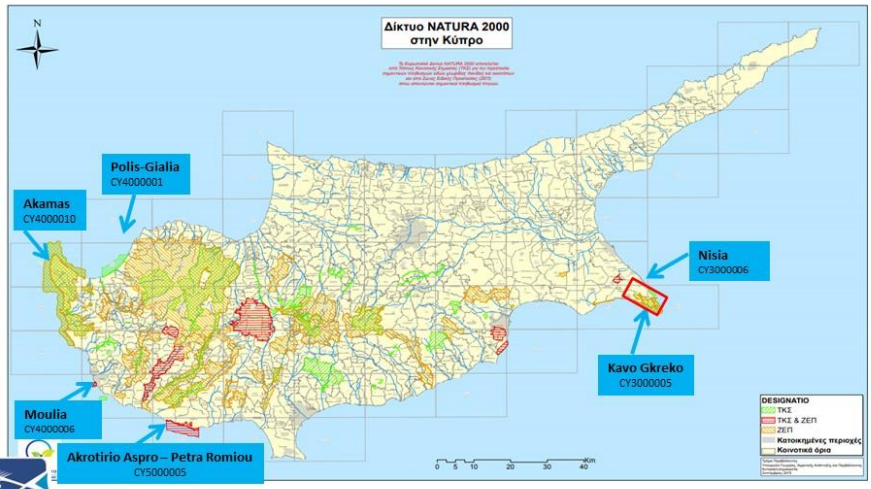
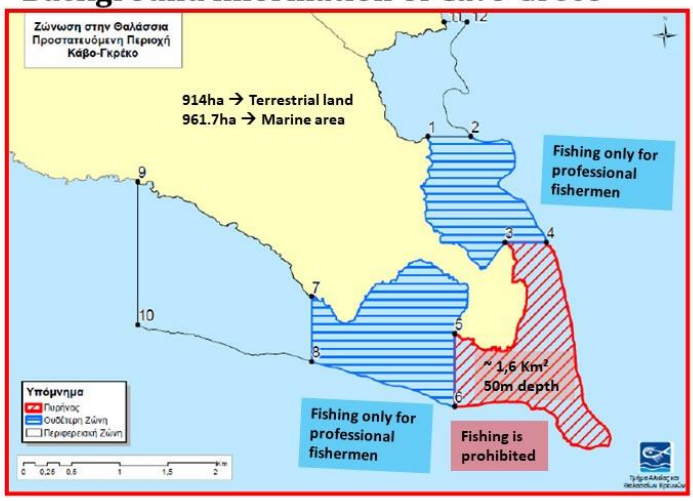
## Background information of Cavo Greco




Project co-funded by the European Regional Development Fund and the National Funds of the participating countries

## Background information of Cavo Greco

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*Open day activity event for the marine environment*
*Environmental Center of Cavo Greko, Cyprus 27/03/2019*
Interreg Balkan-Mediterranean RECONNECT

# Marine Habitats of Cavo Greco

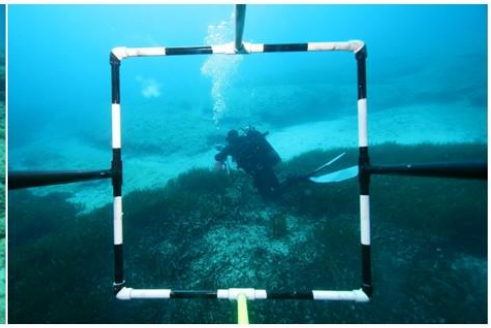
Project co-funded by the European Regional Development Fund and the National Funds of the participating countries

*Open day activity event for the marine environment*
*Environmental Center of Cavo Greko, Cyprus 27/03/2019*

Interreg Balkan-Mediterranean RECONNECT

## Marine habitat types Habitat Directive 92/43/EEC

- ✓ 1110 Sandbanks
- ✓ 1120 *Posidonia oceanica* meadows
- ✓ 1170 Reefs
- ✓ 8330 Submerged or partially submerged caves

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*Open day activity event for the marine environment*
*Environmental Center of Cavo Greko, Cyprus 27/03/2019*

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## Marine habitat types Habitat Directive 92/43/EEC

### 1110 Sandbanks


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*Open day activity event for the marine environment*
*Environmental Center of Cavo Greko, Cyprus 27/03/2019*

Interreg Balkan-Mediterranean RECONNECT

## Marine habitat types Habitat Directive 92/43/EEC

### 1120 *Posidonia oceanica* meadows

Project co-funded by the European Regional Development Fund and the National Funds of the participating countries

*Open day activity event for the marine environment*
*Environmental Center of Cavo Greko, Cyprus 27/03/2019*

Interreg Balkan-Mediterranean RECONNECT

## Priority habitat *P. oceanica* meadows

- One of the planet's most productive ecosystems exporting large amounts of organic matter and oxygen,
- Form complex ecosystems and biodiversity hotspots, supporting high level of biodiversity and trophic interactions,
- Areas of refuge, reproduction and nursery for fish and invertebrates also of commercial importance,
- Reduce sedimentation and stabilizes the seabed, absorb hydrodynamism, their banquettes reduce coastal erosion,
- Absorb nutrients helping improve water quality,
- Climate change role as C sink

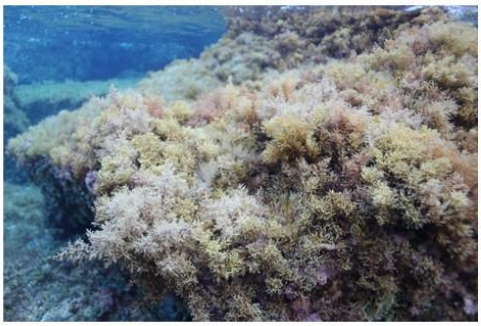
Project co-funded by the European Regional Development Fund and the National Funds of the participating countries

*Open day activity event for the marine environment*
*Environmental Center of Cavo Greko, Cyprus 27/03/2019*

Interreg Balkan-Mediterranean RECONNECT

## Marine habitat types Habitat Directive 92/43/EEC

### 1170 Reefs



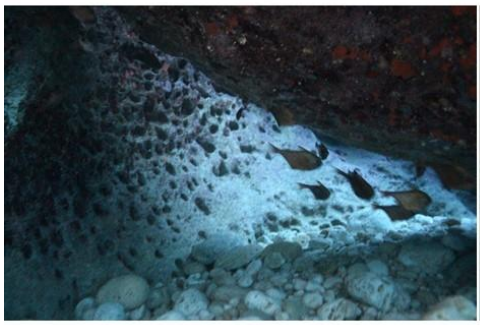

Project co-funded by the European Regional Development Fund and the National Funds of the participating countries

*Open day activity event for the marine environment*
*Environmental Center of Cavo Greko, Cyprus 27/03/2019*

Interreg Balkan-Mediterranean RECONNECT

## Marine habitat types Habitat Directive 92/43/EEC

### 8330 Submerged or partially submerged caves




Project co-funded by the European Regional Development Fund and the National Funds of the participating countries

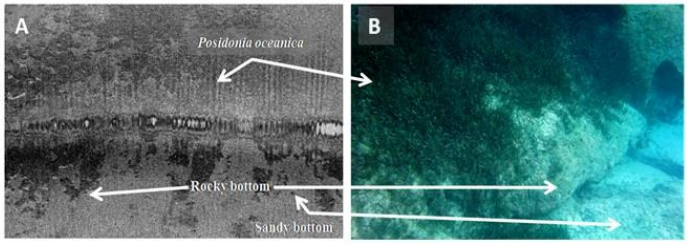
## Sampling surveys: Habitat mapping

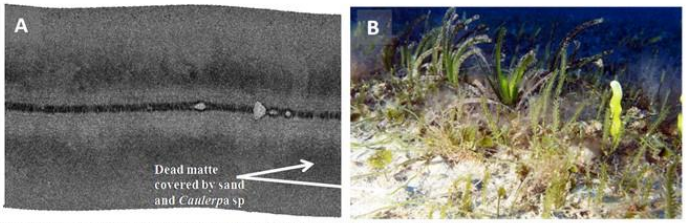
DFMR tender # 11.2010

*Funded by the Operational Fisheries Program 2007-2013, co-funded 50% from the European Fisheries Fund and 50% from national resources*

### 2013

- ✓ **Aerial photos**
- ✓ **Side Scan Sonar**
- ✓ **Multi-beam Sonar**
- ✓ **Ground truthing**
- ✓ **Data processing**
- ✓ **Map development**

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*Open day activity event for the marine environment*
*Environmental Center of Cavo Greko, Cyprus 27/03/2019*

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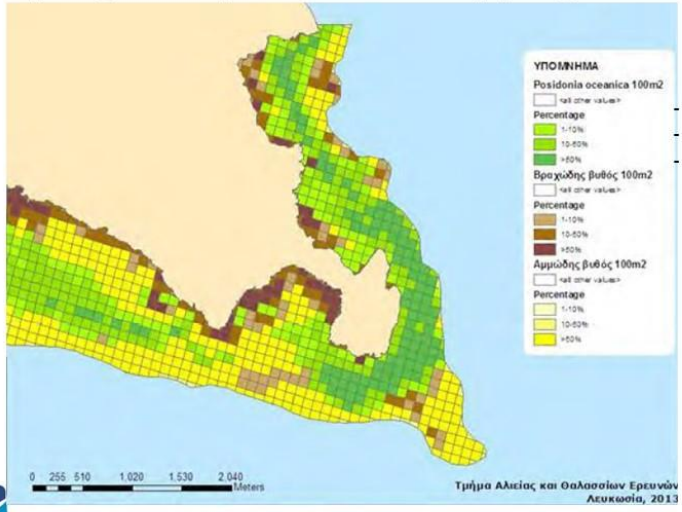
RECONNECT

## Sampling surveys: Habitat mapping




- Less than 10 %
- Between 10 and 50 %
- More than 50 %

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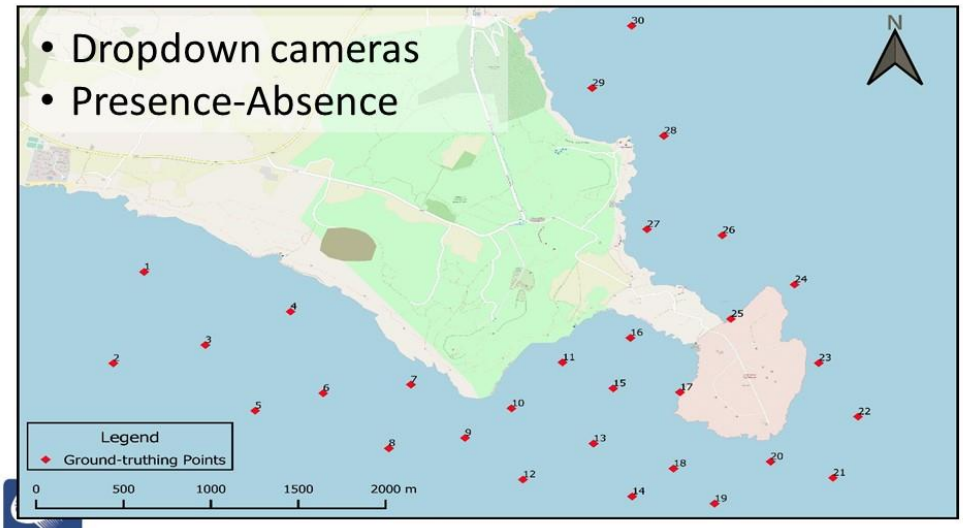
## Sampling surveys: Habitat mapping *(Reconnect)*

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## Sampling surveys: Habitat mapping *(Reconnect)*

| Diving Point | Longitude | Latitute | Depth | Posidonia Oceanica (Yes/No) | Comments | Groundtruthing Video |
|---|---|---|---|---|---|---|
| 1 | 34.06635046 | 34.95612481 | 14.4 | No | Sandy expanse | Point 1 |
| 2 | 34.06865977 | 34.95722616 | | Maybe | Some leaves visible but can not distinct if its live shoots or just dead leaves | Point 2 |
| 3 | 34.06490956 | 34.95899084 | 24 | Yes | Sand with Posidonia oceanica patcehs | Point 3 |
| 4 | 34.06318268 | 34.95863433 | 12 | No | Sand | Point 4 |
| 5 | 34.07302132 | 34.96217341 | 42.8 | No | Some dead Posidonia leaves forming stacks of dead leaves due to currents . Can be mistaken for live shoots, however due to depth limitations this can not be true. | Point 5 |
| 6 | 34.09212153 | 34.97211449 | 22.4 | Yes | Posidonia oceanica patches | Point 6 |
| 7 | 34.06865977 | 34.95722616 | 19.6 | yes | Sand with Posidonia oceanica nearby | Point 7 |
| 8 | 34.07638294 | 34.96301442 | 51.8 | No | Dead Posidonia ocenica leaves | Point 8 |
| 9 | 34.07638294 | 34.96301442 | 35 | No | Some dead Posidonia oceanica leaves | Point 9 |
| 10 | 34.07638294 | 34.96301442 | 24.3 | | | Point 10 |
| 11 | 34.07638294 | 34.96301442 | 15.8 | | Sand/Posidonia oceanica nearby | Point 11 |
| 12 | 34.07638294 | 34.96301442 | 51 | No | Some dead Posidonia oceanica leaves | Point 12 |
| 13 | 34.09497844 | 34.96469949 | 32.1 | Maybe | Sand with some Posidonia oceanica leaves.A small patch is visible, however can not tell if the shoots are alive or its just dead leaves. | Point 13 |
| 14 | 34.09004007 | 34.96574758 | 45.7 | No | No Posidonia visible | Point 14 |
| 15 | 34.09497844 | 34.96469949 | 18 | No | Sand | Point 15 |
| 16 | 34.09497844 | 34.96469949 | 8.8 | No | Sand with rocks nearby and some Posidonia oceanica leaves | Point 16 |
| 17 | 34.08647493 | 34.96338484 | 13 | No | Reef | Point 17 |
| 18 | 34.09212153 | 34.97211449 | 32 | Yes | Reefs with some Posidonia oceanica | Point 18 |
| 19 | 34.09212153 | 34.97211449 | 40.5 | No | Some Posidonia oceanica dead leaves | Point 19 |
| 20 | 34.09004007 | 34.96574758 | 17 | Yes | Posidonia oceanica meadow | Point 20 |
| 21 | 34.09004007 | 34.96574758 | 30.3 | Yes | Posidonia oceanica meadow with sand | Point 21 |
| 22 | 34.09004007 | 34.96574758 | 38.3 | | | Point 22 |
| 23 | 34.09004007 | 34.96574758 | 12.4 | No | Sand | Point 23 |
| 24 | 34.09004007 | 34.96574758 | | Yes | Posidonia oceanica on hard substrate | Point 24 |
| 25 | 34.09004007 | 34.96574758 | | No | No Posidonia/ Reef | Point 25 |
| 26 | 34.09212153 | 34.97211449 | | Yes | Posidonia oceanica with matte (lagocephalus attacking the camera) | Point 26 |
| 27 | 34.09004007 | 34.96574758 | 3.4 | No | Rock no Posidonia oceanica | Point 27 |
| 28 | 34.09004007 | 34.96574758 | | Maybe | Maybe some Posidonia shoots but mostly dead leaves (lagocephalus attacking the camera) | Point 28 |
| 29 | 34.09004007 | 34.96574758 | | No | Sand | Point 29 |
| 30 | 34.09004007 | 34.96574758 | | Yes | Posidonia oceanica | Point 30 |

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# Monitoring Biota

*Baseline survey and monitoring of non-indigenous species in Cavo Greco and Nisia Marine Protected Areas in Cyprus*
DFMR tender # 26.2016

*Project funded by ΘΑΛΑΣΣΑ 2014-2020, co-funded by the European Maritime & Fisheries Fund (75%) and national sources (25%)*

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# Monitoring Biota

- 2 year project (2017 – 2018)
- 27 sampling sites – stratified random sampling in two Marine Protected Areas.
- 3 habitats (*Posidonia oceanica* meadows, hard substrate and soft substrate)
- Different bathymetric zones (0-5 m, 5-15 m, 15-30 m, >30 m)
- Same methods repeated seasonally.

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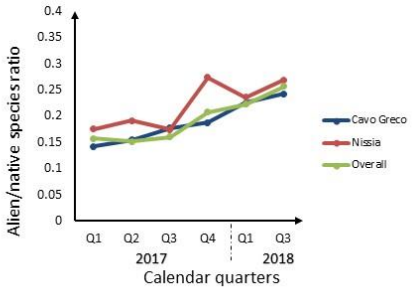
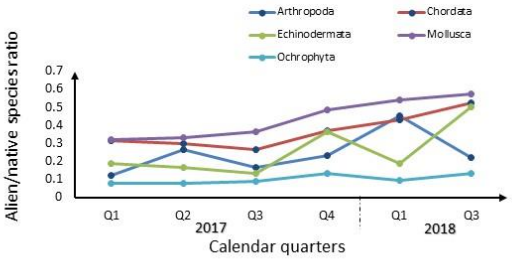
# Monitoring Biota

## Key findings

- 272 were characterised as native, 45 as alien, 2 as cryptogenic .
- Number of NIS is rising
- Mollusca and chordata are the taxa with most of the alien

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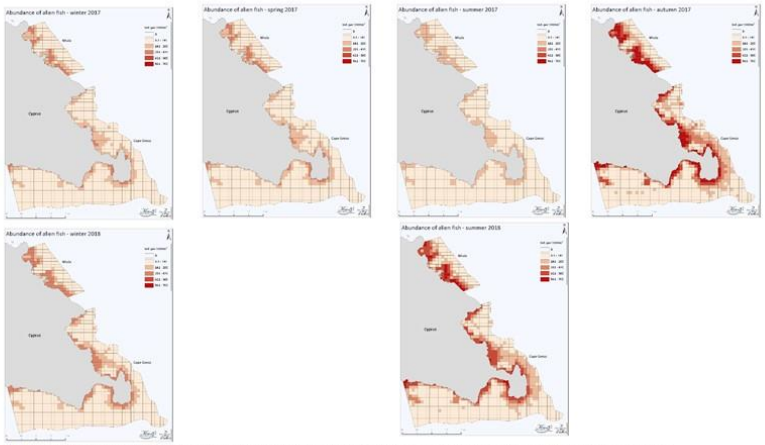
# Monitoring Biota

## Alien fish



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## Hotspot of alien species
## Importance of citizen science

- Through citizen science observations we recorded six new NIS from these areas in the past three years:
  - Sea slug *Plocamopherus ocellatus* Rüppell & Leuckart, 1828, *Haminoea cyanomarginata* Heller & Thompson, 1983, *Goniobranchus obsoletus* (Rüppell & Leuckart, 1830)
  - Crab *Atergatis roseus* (Rüppell, 1830)
  - Fish *Cheilodipterus novemstriatus* (Rüppell, 1838)
  - Sea urchin *Diadema setosum* (Leske, 1778)


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# RELIONMED LIFE Project

## Preventing a LIONfish invasion in the MEDiterranean through early response and targeted Removal

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# RELIONMED Project

A four year European project aiming to tackle the lionfish invasion and create the first line of defence in Cyprus

Project co-funded by the European Regional Development Fund and the National Funds of the participating countries

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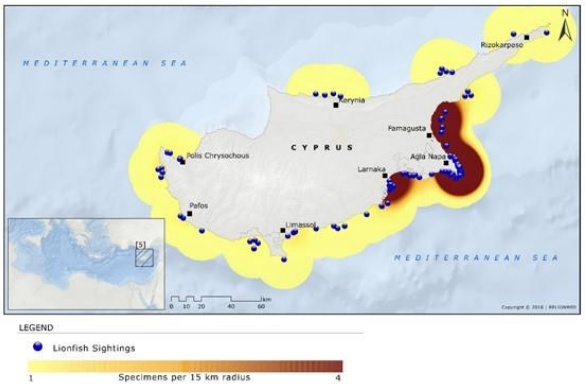
# RELIONMED Project

To improve citizen-capacity and participation

- Surveillance system
- Removal Action Teams
- Lionfish derbies

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# RECONNECT PROJECT

- **Biodiversity Assessment**
- **Marine Litter Assessment**
- ***Posidonia oceanica* demography**
- **Water, sediment, and macrofauna**
- **Genetic analyses**
- **Citizen science**

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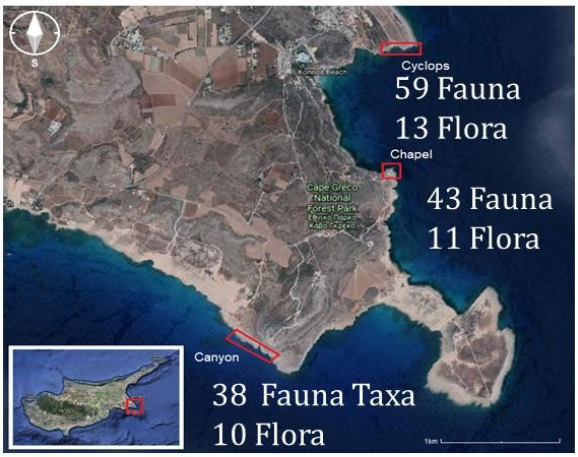
# 1. Biodiversity assessments

- 80 Fauna Taxa
- 15 NIS
- 16 Flora Taxa

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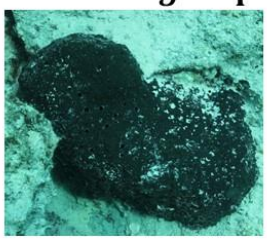
# 1. Biodiversity assessments

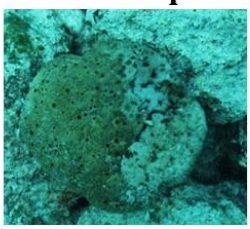
***Aurelia* sp.**

***Hermodice carunculata***

***Sarcotragus* sp.**

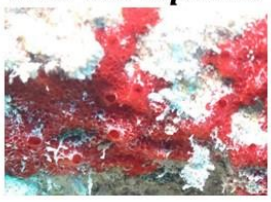


***Ircinia* sp.**



***Echinocardium* sp.**

***Phorbas topsenti***



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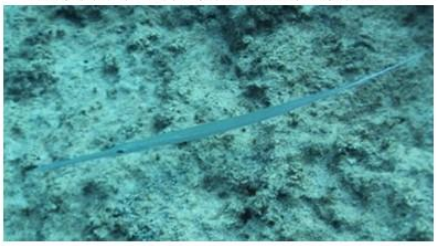
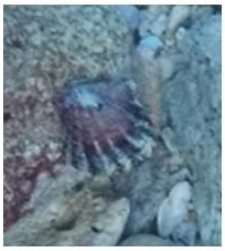
# 1. Biodiversity assessments

***Pterois miles***

***Fistularia commersonii***



***Pinctata radiata***



***Torquigener flavimaculosus***

***Synaptula reciprocans***

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# 2. Marine litter assessment (WP3)

- Underwater visual surveys

**5.4. Protocol for shallow sea-floor (< 20m)**

The most commonly used method to estimate marine litter density in shallow coastal areas is to conduct underwater visual surveys with SCUBA/snorkelling. These surveys are best based on line transect surveys of litter on the sea-floor, which is derived from UNEP (Cheshire, 2009). The protocol is actually in use for evaluation of benthic fauna. It requires SCUBA equipment and trained observers. Only litter items above 2.5 cm are considered, between 0 and 20 m (to 40 meters with skilled divers).

- Record & remove litter (> 2cm) along transects
- Categories litter (Master List)

JRC SCIENTIFIC AND POLICY REPORTS

Guidance on Monitoring of Marine Litter in European Seas

*A guidance document within the Common Implementation Strategy for the Marine Strategy Framework Directive*

MSFD Technical Subgroup on Marine Litter

2013

**Annex 8.1 - Master List of Categories of Litter Items**

**Master List of Categories of Litter Items**

| TSG ML General - Code | OSPAR - Code | UNEP - Code | General Name | Level 1 - Materials | Core | Beach | Seafloor | Floating | Biota | Micro |
|---|---|---|---|---|---|---|---|---|---|---|
| G1 | 1 | PL05 | 4/6-pack yokes, six-pack rings | Artificial polymer materials | x | x | | | | |
| G2 | | PL07 | Bags | Artificial polymer materials | x | | x | x | | |
| G3 | 2 | PL07 | Shopping Bags incl. pieces | Artificial polymer materials | | x | | | | |

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# 2. Marine litter assessment

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Regional cooperation for the transnational ecosystem sustainable development
*2nd Interim Meeting, Tirana, Albania, 25-27/02/2019*

# 2. Marine litter assessment (WP3)

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# 2. Marine litter assessment

| Site | Litter per $m^2$ |
|---|---|
| **Cyclop's Cave (Avg Depth 3.08 m)** | 0.0525 |
| **Cyclop's Cave (Avg Depth 5.26 m)** | 0.015 |
| **Cyclop's Cave (Avg Depth 12.48 m)** | 0.00875 |
| **Agioi Anargyroi (Avg Depth 5.3 m)** | 0.02375 |
| **Agioi Anargyroi (Avg Depth 11.56 m)** | 0.05 |
| **Agioi Anargyroi (Avg Depth 16.56 m)** | 0.015 |
| **Canyon (Avg Depth 13.22 m)** | 0.00625 |
| **Canyon (Avg Depth 15 m)** | 0.03 |
| **Canyon (Avg Depth 15.33 m)** | 0.01625 |

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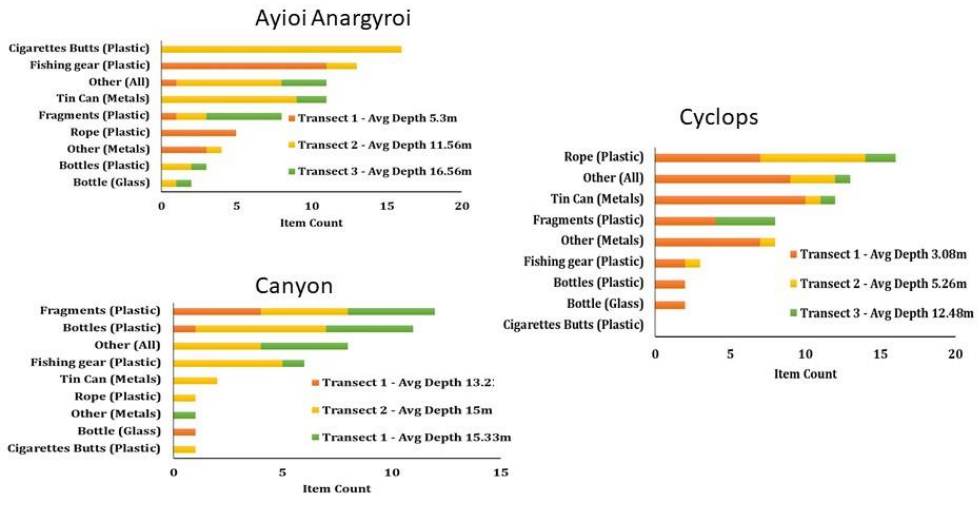


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# 2. Marine litter assessment

| Area | Depth (m) | Items/100m$^2$ | Source |
|---|---|---|---|
| Cavo Greco (Cyclop's caves) | 1-14 | 2.54 | Present study |
| Cavo Greco (Ayioi Anargyroi) | 4-18 | 2.96 | Present study |
| Cavo Greco (Canyon) | 11-16 | 1.75 | Present study |
| Adriatic Sea | 3-24 | 2.78 ± 3.35 | Vlachogianni et al., 2018 |
| Gulf of Aqaba, Red Sea | 0-10 | 280 | Abu-Hilal and Al-Najjar, 2009 |
| N. Hawaiian Island, Lisianski Island | 10 | 0.4*10-3 – 6.2*10-3 | Donohue et al., 2001 |
| Gray's Reef National Marine Sanctuary, USA | 16-20 | 0.52 ± 0.11 | Bauer et al., 2008 |
| Eastern Mediterranean Sea, Greece | 0-25 | 1.5 | Katsanevakis and Katsarou, 2004 |

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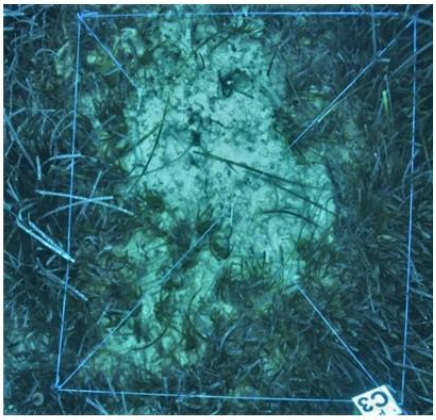
# 3. *P. oceanica* demography (WP3)

- 3 fixed plots per site, surface of 1m$^2$, divided in 4 triangles
- Shoot density of each triangular sub-quadrat
- Each quadrat was photographed from the top side → Photos processed with Photoquad software (Trygonis and Sini, 2012) to estimate the % coverage of the canopy.



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# 3. *P. oceanica* demography

| Site: | Cyclops Caves | | |
|---|---|---|---|
| Code: | P_A1 | P_A2 | P_A3 |
| Depth: | 12.8 | 12.1 | 19.7 |
| Layout of plot / Shoot Counts: | 60 / 35 35 / 97 | 39 / 29 126 / 125 | 76 / 2 92 / 51 |
| Shoot density (m$^2$) | 227 | 319 | 221 |
| Coverage (%) | 39 | 63 | 59 |
| Site: | Agioi Anargyroi | | |
| Code: | P_B1 | P_B2 | P_B3 |
| Depth: | 19 | 16.1 | 14 |
| Layout of plot / Shoot Counts: | 100 / 112 31 / 26 | 33 / 80 7 / 30 | 100 / 141 113 / 93 |
| Shoot density (m$^2$) | 269 | 150 | 447 |
| Coverage (%) | 50 | 22 | 78 |
| Site: | Canyon | | |
| Code: | P_C1 | P_C2 | P_C3 |
| Depth: | 13 | 12.5 | 9.9 |
| Layout of plot / Shoot Counts: | 67 / 48 73 / 58 | 125 / 146 195 / 74 | 53 / 119 204 / 143 |
| Shoot density (m$^2$) | 246 | 540 | 519 |
| Coverage (%) | 47 | 71 | 73 |

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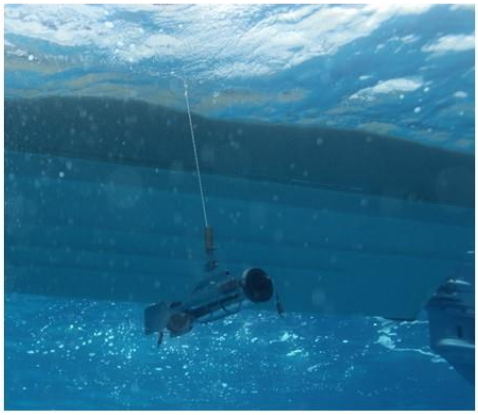
# 4. Water, sediment, macrofauna

## KC Denmark Van dorm sampler

- POC
- Chloroplast pigments
- Phosphate ion ($PO_4^{3-}$)
- Nitrate ion ($NO_3^-$)
- Nitrite ion ($NO_2$)
- Ammonium ion ($NH_4^+$)
- Silicon dioxide ($SiO_2$)



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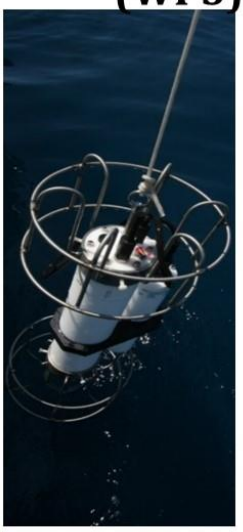
# 4. Water, sediment, macrofauna (WP3)

## Idronaut CTD

| Site | Quadrat Code | Date in 2018 | Max. Depth (m) | Temp (°C) | Cond. (mS/cm) | Sal. (‰) | $O_2$ (%) | $O_2$ (ppm) | pH | Eh (mV) |
|---|---|---|---|---|---|---|---|---|---|---|
| Cyclop's Cave | P-A1 | 08/12 | 12.8 | 20.83 | 54.59 | 39.74 | 90.41 | 6.39 | 8.61 | 129.11 |
| | P-A2 | 08/12 | 12.1 | 20.84 | 54.60 | 39.75 | 91.1 | 6.44 | 8.61 | 133.60 |
| | P-A3 | 08/12 | 19.7 | 20.83 | 54.59 | 39.75 | 90.78 | 6.41 | 8.61 | 128.35 |
| Agioi Anargyroi | P-B1 | 08/12 | 19.3 | 20.77 | 54.26 | 39.53 | 89.23 | 6.32 | 8.61 | 115.74 |
| | P-B2 | 08/12 | 16.1 | 20.78 | 54.48 | 39.71 | 89.62 | 6.34 | 8.61 | 113.78 |
| | P-B3 | 08/12 | 14 | 20.77 | 54.47 | 39.70 | 91.15 | 6.45 | 8.61 | 111.77 |
| Canyon | P-C1 | 29/10 | 13 | 25.11 | 59.66 | 39.85 | 90.9 | 5.96 | 8.49 | 139.40 |
| | P-C2 | 29/10 | 12.5 | 25.11 | 59.66 | 39.86 | 90.36 | 5.92 | 8.44 | 140.1 |
| | P-C3 | 29/10 | 9.9 | 25.16 | 59.75 | 39.87 | 93.45 | 6.12 | 8.50 | 149.32 |



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## 4. Water, sediment, macrofauna

- **Sediment**
  - 3 sites x 2 replicates x 3 stations
  - Analyses: pH, Redox, Particulate Organic Carbon (POC), chloroplast pigments concentrations (chlorophyll-a and phaeopigments), organic matter (loss on ignition), granulometry
- **Macrofauna**
  - 3 sites x 3 replicates x 3 stations
  - Core samplers with 10 cm diameter
  - Sieved 0.5 mm
  - Stored in 96% ethanol



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## Sampling surveys for genetic analysis

## *Key species 1: Posidonia oceanica*

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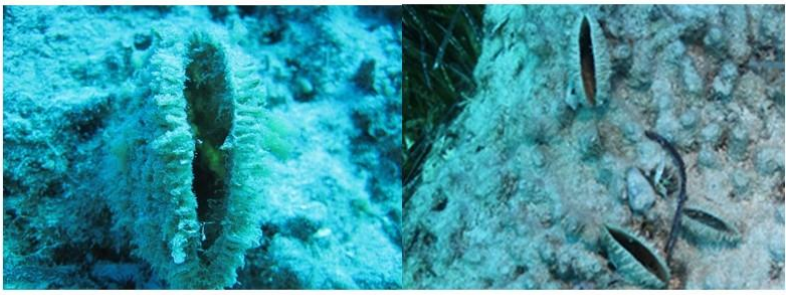
## Sampling surveys for genetic analysis

### *Key species 2: Pinna nobilis*

- Only dead *Pinna nobilis* were found
- No alive ones to collect samples
- Replacement of key species





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## Sampling surveys for genetic analysis

### *Key species 3: Vermetid reefs*


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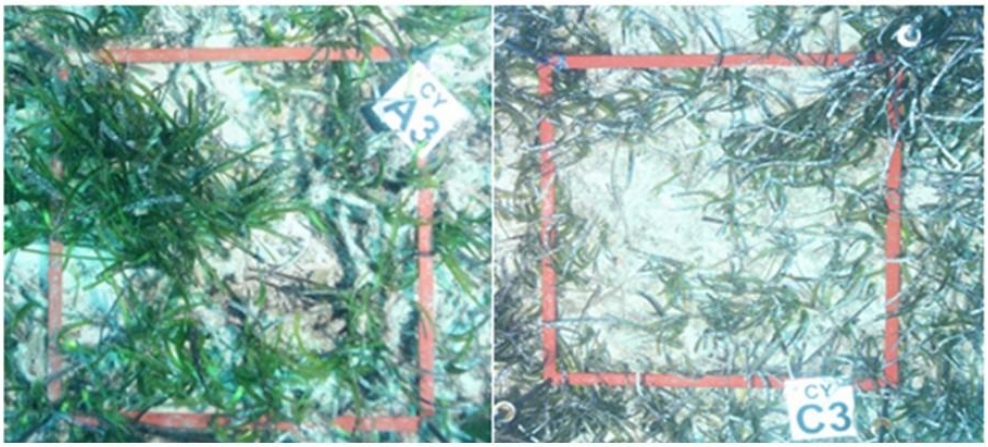
## Sampling surveys for Citizen Science

***Quadrats:*** 5 permanent sampling quadrat frames in *P. oceanica*




**Quadrats: 50 cm x 50 cm**

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## Sampling surveys for Citizens Science

***Quadrats (P. oceanica beds)***

| Site | Quadrat Code | Depth (m) | Seagrass Coverage (%) |
|---|---|---|---|
| Cyclop's Cave | CY_A1 | 10.6 | 100 |
| | CY_A2 | 11.4 | 73 |
| | CY_A3 | 11.1 | 65 |
| | CY_A4 | 16.1 | 69 |
| | CY_A5 | 18.9 | 67 |
| Agioi Anargyroi | CY_B1 | 20.4 | 41 |
| | CY_B2 | 20.4 | 29 |
| | CY_B3 | 19.1 | 65 |
| | CY_B4 | 17.5 | 9 |
| | CY_B5 | 13.7 | 18 |
| Canyon | CY_C1 | 12.9 | 71 |
| | CY_C2 | 12.2 | 59 |
| | CY_C3 | 12.3 | 39 |
| | CY_C4 | 9.2 | 35 |
| | CY_C5 | 9.8 | 81 |

***In the future, the same fixed plots will be photographed by the citizen scientists and change in % coverage over time will be documented.***

Project co-funded by the European Regional Development Fund and the National Funds of the participating countries

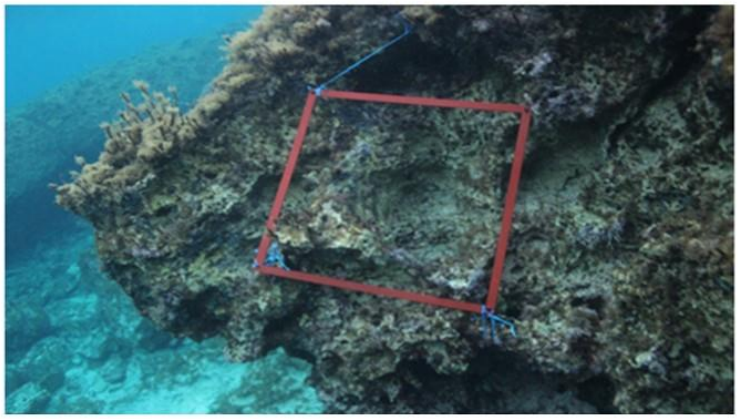
*Open day activity event for the marine environment*
*Environmental Center of Cavo Greko, Cyprus 27/03/2019*

Interreg Balkan-Mediterranean RECONNECT

## Sampling surveys for Citizens Science

***Quadrats (hard substratum)***

- Attached with ropes
- Searching for better alternatives



Project co-funded by the European Regional Development Fund and the National Funds of the participating countries

*Open day activity event for the marine environment*
*Environmental Center of Cavo Greko,, Cyprus 27/03/2019*

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University of Cyprus
Department of Biological Sciences

**RECONNECT**

INTERREG V-B "Balkan-Mediterranean 2014-2020"

Regional cooperation for the transnational ecosystem sustainable development

# Citizen Science involvement in monitoring the marine environment of Cavo Greco

**Training workshop, Cavo Greco, Cyprus, 16/05/2019**

Antonis Petrou
AP Marine Environmental Consultancy Ltd

**Project co-funded by the European Union and National Funds of the participating countries**



## Marine Environment and Society

- The marine environment supports a diverse range of sea life that is important for global biodiversity.
- A healthy marine environment supports our cultural and social well-being, and the ocean's resources contribute to our economy.
- The marine and coastal environment also plays a significant role in the economy and way of life.

**Project co-funded by the European Union and National Funds of the participating countries**

# What is Citizen Science?

As defined by European Commission in a White paper on Citizen Science:

*"Citizen Science refers to the general public engagement in scientific research activities when citizens actively contribute to science either with their intellectual effort or surrounding knowledge or with their tools and resources."*

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Regional cooperation for the transnational ecosystem sustainable development
*Training workshop, Cavo Greco, Cyprus, 16/05/2019*

# Benefits of Citizen Science

Citizen Science offers immediate benefits to the volunteers who participate in it.

- **Enjoyment:** Many volunteers find Citizen Science activities to be fun.
- **Social community:** Citizen Scientists receive the benefit of participating in the social community enabled by networking tools such as the forum and blog, and meetups in real life.
- **Ability to participate in real science:** Citizen Science allows volunteers to participate in real scientific projects, and to be recognized for this participation.

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## Benefits of Citizen Science

Citizen Science offers immediate benefits to the volunteers who participate in it.

- Education of the public in science.
- Better attitudes towards science.
- Improved scientific knowledge and literacy.
- Improved scientific thinking and the ability to use science to solve daily problems.
- Increased awareness and knowledge of various problems.

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*Training workshop, Cavo Greco, Cyprus, 16/05/2019*

## Benefits of Citizen Science

Citizen Science could also lead to major benefits to society.

- Closer connection between scientists and the public: The public often sees science and scientists as being different and distanced from everyday life.
- Increase in scientific understanding and habits by the public: The more the public is involved in any scientific effort, the more they are exposed to the concepts and vocabulary of the subject matter being studied.

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# Citizen Science projects

- Environmental monitoring using citizen science projects has increased worldwide over the past few years.
- These projects have been implemented in many ecosystems including marine and terrestrial environments.
- It not only serves the purpose of increasing knowledge and awareness about the environment, it also increases the amount of information and data that can be collected when funding is limited.

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# Marine Citizen Science RECONNECT project

One of the main goals of the project is for the public to be **engaged and involved** in the scientific research which is achieved through the citizen science programs.

Citizen science involves data collection by members of the public that in other cases would be difficult to collect.

Divers will enjoy their dive and at the same time will contribute in the scientific research collecting data.

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## Importance of divers in Marine Citizen Science

Scuba diving significantly increases the potential of Marine Citizen Science, thanks to the skills and behavioural properties of people who participate in the diving sport.

Engaging scuba divers in marine citizen science plays a crucial role in promoting the acceptance of management decisions.

Divers may receive **personal benefits** such as: increased knowledge or improved skills, a sense of fulfilment or pride, strengthened social bonds, and increased wellbeing in terms of better physical and mental health.

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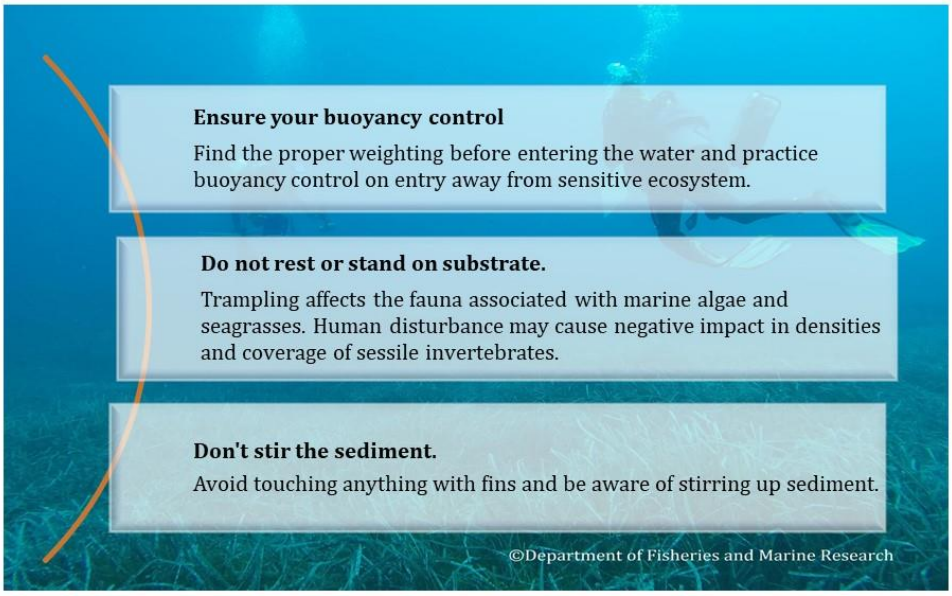


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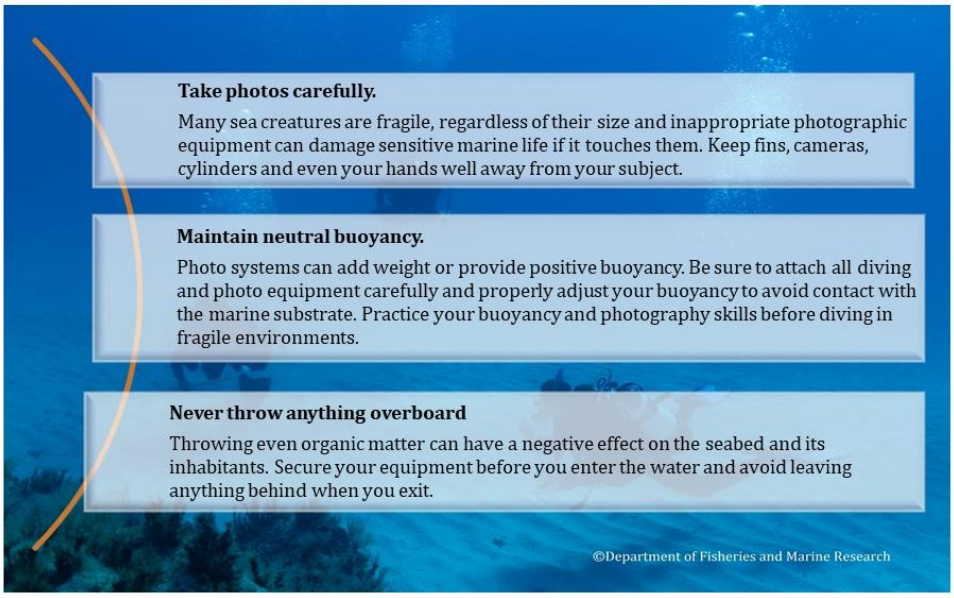


Project co-funded by the European Union and National Funds of the participating countries

## RECONNECT project

The **main outputs** of the RECONNECT project will be to provide information:

- concerning habitat attributes,
- the essential biodiversity,
- socio-economic and cultural variables.

The **overall goal** of the **data collection** is the:

- identification of marine species found in the quadrats,
- monitoring of changes in biodiversity over time.

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## RECONNECT Project Workshop

The aims of this training for the divers are:

- to learn about the RECONNECT project,
- to become familiar with the Citizen Science,
- to acknowledge the importance of their contribution and
- to familiarize with the appropriate methodology as well as with the biodiversity of the pilot areas.

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## Study area


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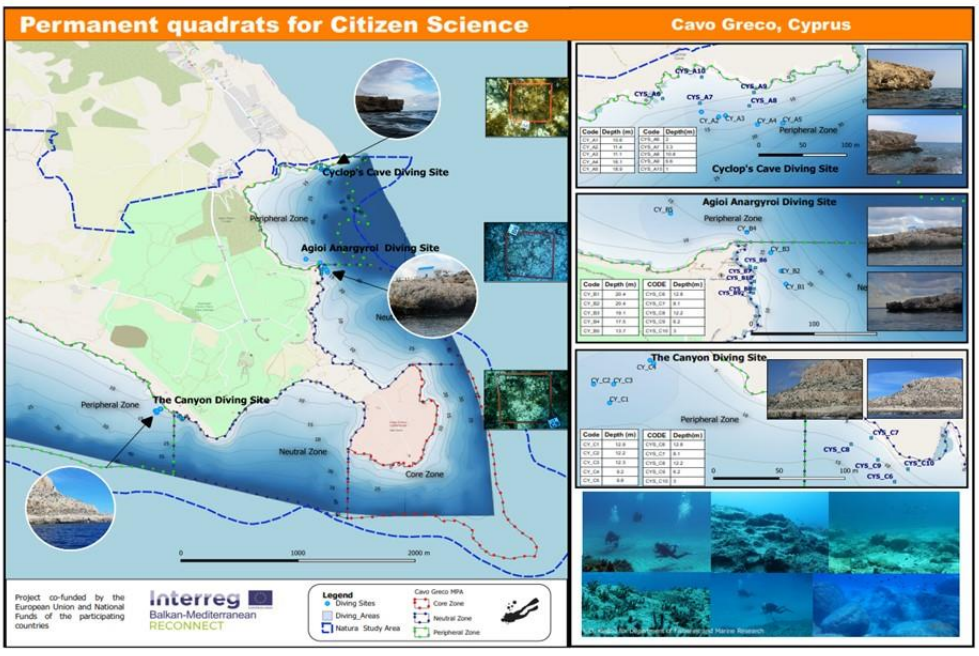

## Study area

In Cavo Greco area (Cyprus), 3 pilot stations were chosen, where permanent quadrats have been placed in *Posidonia oceanica* meadows and on hard substrates.

**Ag. Anargyroi (Chapel):**

- The site is located near Cavo Greco, just in front of the chapel of Ag. Anargyroi.
- The depths are between 0-30 meters.
- The substrate is mostly rocky, it alternates with large meadows of *Posidonia oceanica*.

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*Training workshop, Cavo Greco, Cyprus, 16/05/2019*

## Study area

**Ag. Anargyroi (Chapel):**

- Entering the water (with caution because in some places there are rough and slippery rocks), depths starts at 7 meters.

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## Study area

**Cyclopes cave:**

- The area is accessible both by land and sea.
- The depths of the route are between 0-25 meters.
- The substrate is mostly rocky.
- Entering the water, the substrate is initially rocky for about 50 meters (southeast), reaching 5 meters depth, having the land on our left.

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## Study area

**Canyon:**

- Situated at the south side of Cape Greco just under the cliffs, access is from the shore.
- Maximum depth is 18 meters.

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## Study area

Each site has:

- 5 permanent quadrats in *Posidonia oceanica* meadows.
- 5 permanent quadrats on hard substrates.

Submerged buoys have been attached to the quadrat, rising 1-2 m from the seafloor to mark the quadrats locations, as well as identification labels.


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Regional cooperation for the transnational ecosystem sustainable development
*Training workshop, Cavo Greco, Cyprus, 16/05/2019*

**"You can help! Become a citizen scientist"**

## Methodology

### Step 1: Dive the site

A website where citizens scientists will be able to find GPS coordinates and information regarding the pilot sites has been developed.
https://cs-reconnect.hcmr.gr.

All citizen scientists should familiarize themselves with the local area of the 3 pilot stations before diving.

**RE-CONNECT the lines to protect marine life.**

Project co-funded by the European Union and National Funds of the participating countries

**"You can help! Become a citizen scientist"**

## Methodology

**Step 1: Dive the site** (continue)

Familiarize yourself with the local area. This can be done by:

- Visiting the project website https://cs-reconnect.hcmr.gr. and find the coordinates for each quadrat for the dives sites.
- If you have never dived these sites, consider going with someone who is familiarize with the locations (i.e a friend or with a dive center).

**Step 2: Search for the quadrats**

For each quadrat, a code name was given.



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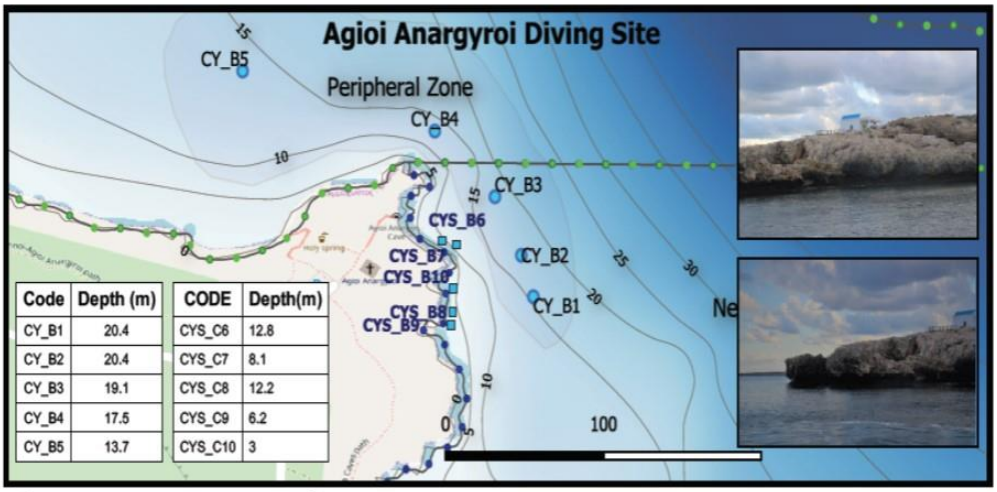
*Training workshop, Cavo Greco, Cyprus, 16/05/2019*

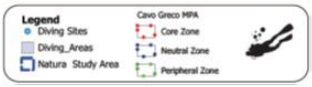
**"You can help! Become a citizen scientist"**

## Methodology




| Code | Depth (m) |
|---|---|
| CY_B1 | 20.4 |
| CY_B2 | 20.4 |
| CY_B3 | 19.1 |
| CY_B4 | 17.5 |
| CY_B5 | 13.7 |

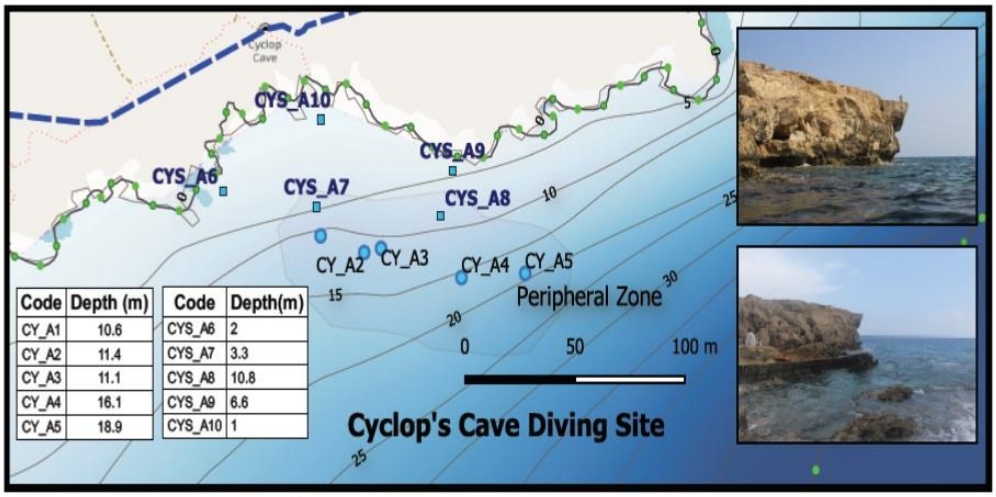
| CODE | Depth(m) |
|---|---|
| CYS_C6 | 12.8 |
| CYS_C7 | 8.1 |
| CYS_C8 | 12.2 |
| CYS_C9 | 6.2 |
| CYS_C10 | 3 |




**RE-CONNECT the lines to protect marine life.**
Project co-funded by the European Union and National Funds of the participating countries

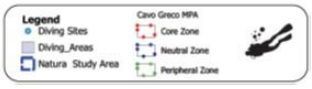
**"You can help! Become a citizen scientist"**

## Methodology




| Code | Depth (m) |
|---|---|
| CY_A1 | 10.6 |
| CY_A2 | 11.4 |
| CY_A3 | 11.1 |
| CY_A4 | 16.1 |
| CY_A5 | 18.9 |

| Code | Depth(m) |
|---|---|
| CYS_A6 | 2 |
| CYS_A7 | 3.3 |
| CYS_A8 | 10.8 |
| CYS_A9 | 6.6 |
| CYS_A10 | 1 |

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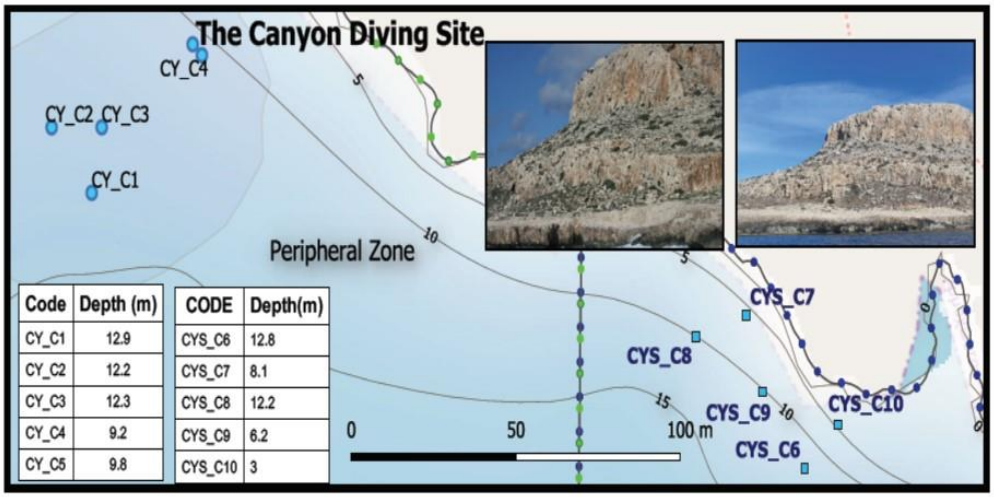
*Training workshop, Cavo Greco, Cyprus, 16/05/2019*
Interreg Balkan-Mediterranean RECONNECT

**"You can help! Become a citizen scientist"**

## Methodology




| Code | Depth (m) |
|---|---|
| CY_C1 | 12.9 |
| CY_C2 | 12.2 |
| CY_C3 | 12.3 |
| CY_C4 | 9.2 |
| CY_C5 | 9.8 |

| CODE | Depth(m) |
|---|---|
| CYS_C6 | 12.8 |
| CYS_C7 | 8.1 |
| CYS_C8 | 12.2 |
| CYS_C9 | 6.2 |
| CYS_C10 | 3 |


**RE-CONNECT the lines to protect marine life.**
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**"You can help! Become a citizen scientist"**

## Methodology

### Step 3: Take your photo

- Make sure the whole quadrat and its label is in the picture.
- Don't forget to double-check your photo to make sure it's in focus.
- Make sure that the lighting settings is adjusted to the environmental conditions, e.g. cloud coverages and visibility.



Regional cooperation for the transnational ecosystem sustainable development
*Training workshop, Cavo Greco, Cyprus, 16/05/2019*

**"You can help! Become a citizen scientist"**

## Methodology

### Step 4:Report what's important

Apart from taking pictures of the quadrats you can report anything you think it's important. You can take pictures:

- of marine litter,
- any marine organism that may found interesting or you are curious about,
- abandoned fishing gears etc.

**RE-CONNECT the lines to protect marine life.**
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**"You can help! Become a citizen scientist"**

# Methodology

## Step 5:Upload your photo

Upload your **data** and your **photographs** to the website:

**https://cs-reconnect.hcmr.gr.**

**RE-CONNECT the lines to protect marine life.**

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Thank you for your attention

Any questions??

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RELION MED Life

# 'Preventing a LIONfish invasion in the MEDiterranean through early response and targeted REmoval'

## The RELIONMED EU-LIFE project: Public and stakeholder awareness of invasive lionfish in Europe

«Preventing a lionfish invasion in the Mediterranean through early response and targeted removal (LIFE16 NAT/CY/000832). With the contribution of the LIFE financial instrument of the European Union / www.ec.europa.eu/life»

Yiota Lazarou, University of Cyprus



## Biological features of lionfish, *Pterois miles* (Bennett, 1828)

RELION MED Life

- Belongs to the Scorpaenidae family
- Inhabits both shallow and deep waters (0-300 m)
- Prefers hard substrata and artificial structures
- Long lived species (>10 yrs)
- Sharp venomous spines along dorsal and anal fins
- Daily consumption of prey 2.5-6% of their body weight
- Generalist predators
- Can grow up to 43 cm and 1.1 kg
- Sexually mature in less than a year
- Females can lay over 2 million eggs per year
- Nocturnal hunters

«Preventing a lionfish invasion in the Mediterranean through early response and targeted removal (LIFE16 NAT/CY/000832). With the contribution of the LIFE financial instrument of the European Union / www.ec.europa.eu/life»

RECONNECT Citizen Science Training Seminar, Cavo Greco, 16th May 2019

## Background & Facts

- Displayed one of the most ecologically harmful marine fish invasions to date
- Factors that contribute: Unhabituated potential predators, early and rapid reproduction, wide niche, high versatility, climate change…
- Lionfish population in Europe is expanding rapidly.
- Evidence from the coasts of Cyprus indicates that the invasion 'hotspot' is at our door step, particularly at the eastern side of the island in/near *Natura 2000* sites and MPAs, where lionfish form groups and reproduce.



## Potential threats to biodiversity

- Lionfish invasion could strengthen the impacts on foundation species and ecosystem engineers, by acting synergistically with other anthropogenic stressors
- Compete with the native mesopredators for prey
- Lionfish have been found to cause significant reductions in native fishes

«Preventing a lionfish invasion in the Mediterranean through early response and targeted removal (LIFE16 NAT/CY/000832). With the contribution of the LIFE financial instrument of the European Union / www.ec.europa.eu/life»
RECONNECT Citizen Science Training Seminar, Cavo Greco, 16th May 2019

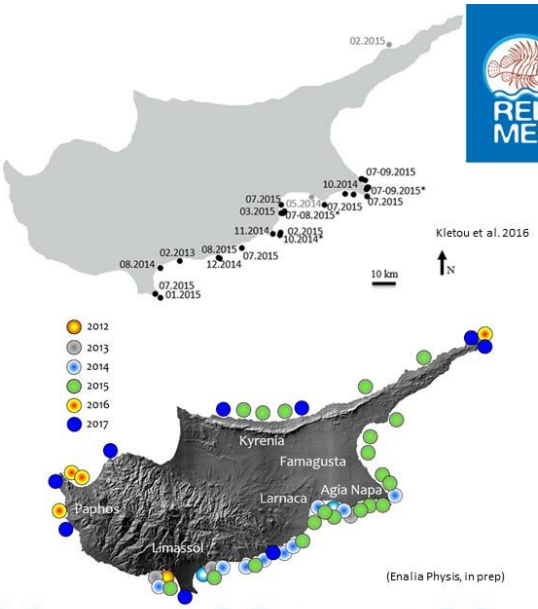
## Potential socio-economic impacts

- Decrease in abundance of commercially important species
- Degradation of important habitats
- Public health threat due to its venomous spines
- Deter diving tourism and bathers



## Lionfish in the Mediterranean

- First recorded in the Mediterranean in 1992 from Israel and after two decades of silence recorded again off Lebanon in 2012
- Since 2014, its population expanded significantly in Cyprus




«Preventing a lionfish invasion in the Mediterranean through early response and targeted removal (LIFE16 NAT/CY/000832). With the contribution of the LIFE financial instrument of the European Union / www.ec.europa.eu/life»
RECONNECT Citizen Science Training Seminar, Cavo Greco, 16th May 2019

## Lionfish in the Mediterranean

- By 2015-2016 the lionfish reached the coasts of central Mediterranean (Tunisia and Italy)


Azzuro *et al.* 2017, *BioInvasions Records*



## RELIONMED overview

**Partners:**

**2 Universities** (University of Cyprus - coordinator, University of Plymouth)

**1 SME** (Marine & Environmental Research (MER) Lab Ltd)

**1 NGO** (Enalia Physis Environmental Research Center)

**1 Governmental body** (Department of Fisheries and Marine Research)

**Duration**:

01/09/2017 - 01/09/2021 (4 years)

University of Cyprus Department of Biological Sciences
PIONEER WITH PLYMOUTH UNIVERSITY MARINE INSTITUTE
Mer Marine & Environmental Research Lab Ltd
ENALIA PHYSIS ENVIRONMENTAL RESEARCH CENTRE

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RECONNECT Citizen Science Training Seminar, Cavo Greco, 16th May 2019

## Which are RELIONMED's targets

- Assess the risks, increase awareness and create social capital;
- Create a surveillance and early detection system;
- Develop RATs (Removal Action Teams) and demonstrate coordinated and opportunistic removals of lionfish around Cyprus, guided by the surveillance system;
- Focus on priority habitats (including Natura 2000, MPAs);
- Explore potential small local market niches that would make future removals economically sustainable (consumption, jewellery);
- Develop tools for managers (models/guides) so that the built capacity can be transferred and replicated in other countries of the Mediterranean.



## RELIONMED Fifteen Actions

Three Preparatory actions (A);

Four Conservation actions (C);

Three Monitoring of the impact of the project actions(D);

Four Public awareness and dissemination of results (E);

Project management (F).

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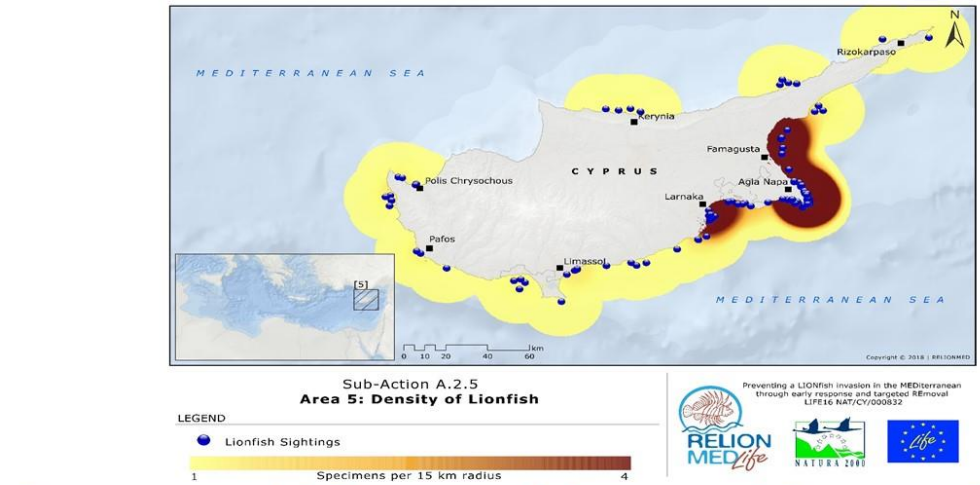
## First Round of Stakeholder Consultations (Action A1)

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## What is coming up?

In RELIONMED project the next step is to activate the sighting portal, training and equipping divers that will form the members of RATs.

Your technical expertise is vital to the researchers of RELIONMED project since your advanced diving skills will allow removals in deeper waters and/or longer dive times.



## DIVERS contribution to the project

We need your support !!!

- 100 divers will be selected
- Express interest here:

https://form.jotform.me/91113240364445?fbclid=IwAR2fkgLL2aQo0OWFoO1pFAn4P_aJUFVWCHSYIgq6V7wQFznOOO7cEF5U0Go

- Report lionfish sightings through the surveillance system that will be created
- Take part in removal actions
- Spread the word

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## DIVERS contribution to the project

- A special license will be given to the participants, by DFMR for the removal of lionfish within the REMIONMED project.
- Only RATs' members will have this license.
- The license will stand until the end of the project.
- During removal events, the participants will be monitored by the organizers.
- No removals will occur during the night (from the sunset to the sunrise)
- The participants will need to use the RELIONMED's toolkit. Only hawaiian sling shot will be allowed.
- All results will be reported to DFMR. DFMR will be also informed prior to each event.



## What is coming up?

Information to be collected by citizen-divers

**Date**
**Time** of the day
Dive **duration**
Bottom **temperature**
**Size** and **location** for each lionfish individual (record all lionfish in the nearest cm, use 5 cm intervals)
**Size** and **location** for each grouper species (record all grouper species in the nearest cm, use 5 cm intervals)
**Depth**

*Record all the information in dive slate and send your information at info@merresearch.com or dedicated Facebook Group that created by MER.*

## What is coming up?

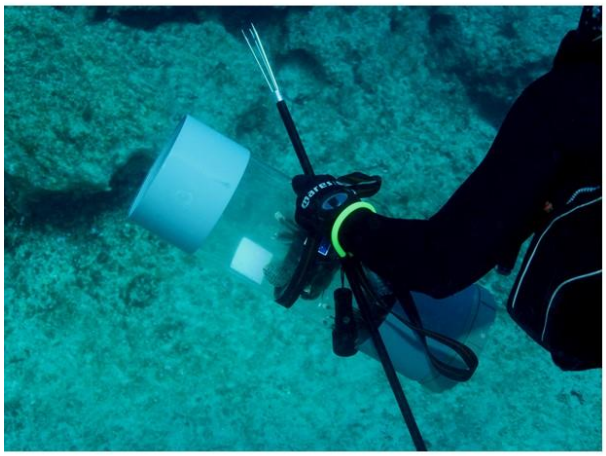
- Two (2) training seminars (Limassol and Cavo Greco)
- Four (4) removal events (derbies).
  One every two months (May, July, September, November)

*Upcoming derby on 26th of May

- Cyclops cave
- Will start at 8:00 am, and will last until 12:00 pm
- Organization base: Ayioi Anargyroi chapel
- Activities: Lionfish removal and size measuring, Cooking
- Certificates will be awarded



## DIVERS contribution to the project

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Thank you!
http://www.relionmed.eu/
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MEDLife
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