

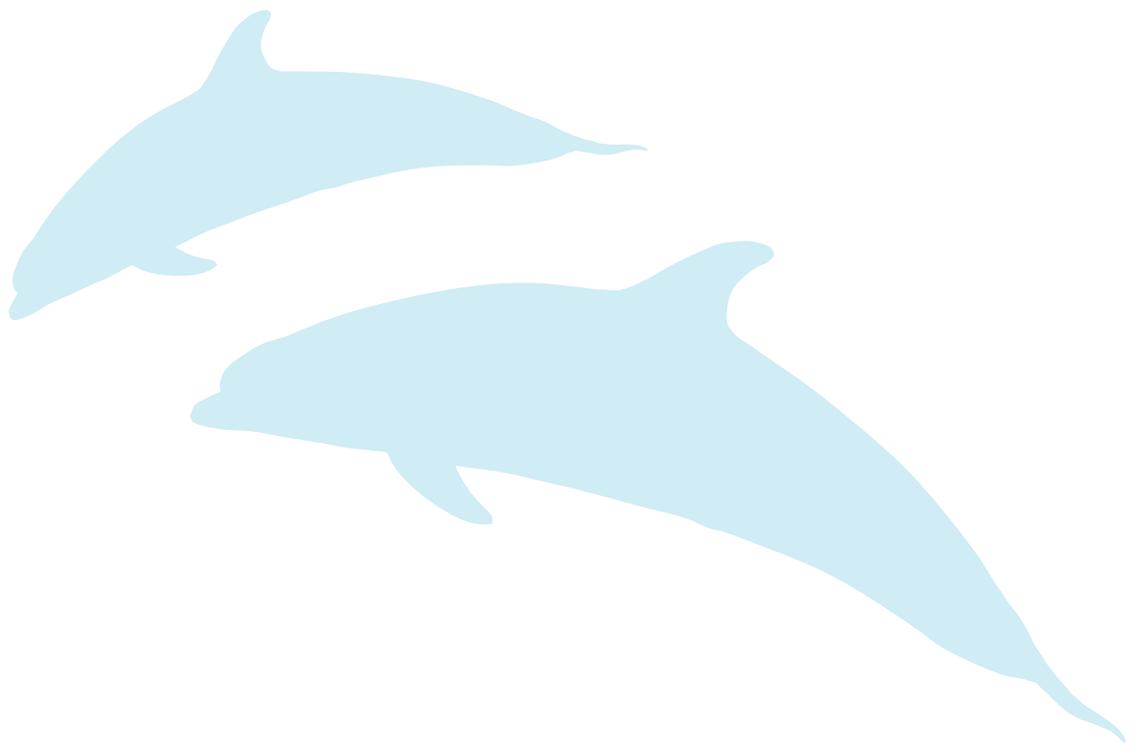


NATURA 2000 SECTORIAL WORKSHOPS

(Malta, 26/09/2014 - 03/10/2014)

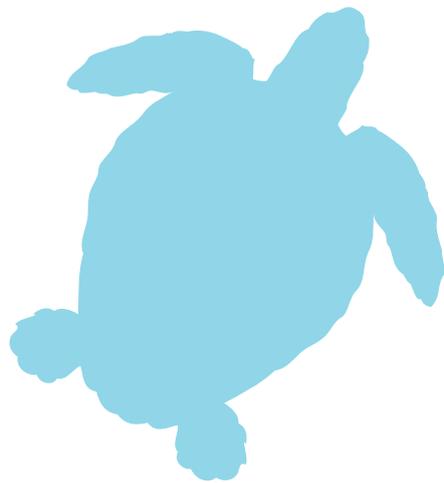
Workshop Report

LIFE+ MIGRATE
**Conservation Status and potential Sites of
Community Interest for *Tursiops
truncatus* and *Caretta caretta* in Malta**
(LIFE 11 NAT/MT/1070)



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0. EXECUTIVE SUMMARY

On September 26th and from September 29th to October 3rd of 2014, six workshops were held in Buggiba (Malta), under the venue of the Malta National Aquarium, and, in the last day, on the Nature Trust Headquarters at Marsaxlokk. KAI Marine Services convened these workshops, with the support of the Malta Environment and Planning Authority (MEPA) in the context of the Project LIFE + Migrate: Conservation Status and potential sites of community interest for *Tursiops truncatus* and *Caretta caretta* in Malta (LIFE 11 NAT/MT/1070).

These sectorial workshops were the final phase of two years of stakeholder communications under action E13 of LIFE+ MIGRATE, moving from stakeholder mapping to one to one meetings and small thematic workshops, mainly with the fisheries and tourism sectors. The sectorial workshops were also an opportunity to open this process to the public showing the procedure that has been used based on the best practice examples of previous LIFE Nature projects and the OSPAR Convention. It must be highlighted that although a day was assigned for the fisheries sector, given the logistical challenge of convening fishers from Gozo and Malta on a good weather day for fishing, the functional workshops of this sector were held a week before with the fishing associations of both islands.

The aim of the workshops was to bring together several sectors that may contribute as active stakeholders and be involved in the conservation of marine species, namely Bottlenose dolphins and Loggerhead turtles in the waters of Malta.

A diversified group of speakers brought their perspectives on the broad themes of conservation, cooperation in the Mediterranean context, maritime transport, pollution (oil spills), the role of the Armed Forces of Malta in conservation, fisheries and aquaculture, technological tools for science and conservation, tourism in Malta, education for sustainable development, etc.

From such an encompassing range of subjects, the main outlook was that besides all the risks (to cetacean and to turtle conservation) associated with the different sectors (transport, energy, defence, fisheries, tourism, science), there was much potential to fulfil through cooperation and shared responsibilities.

These workshops succeeded in putting the main issues arising from the interaction between the target species of LIFE+MIGRATE and the surrounding human activities on the discussion table. However, it must be highlighted that within the process of the development of the Natura 2000 Guidelines, and the stakeholder communication strategy guided by action D1 of LIFE+ MIGRATE, the workshops are only the visible part of the iceberg, given that the consultation

process was kept open to those unable to assist for a period of approximately one month beyond the workshops.

This process, has created a background to the design of the Natura 2000 Guidelines for the conservation of cetaceans and marine turtles in the waters of Malta. Throughout the workshops, it was communicated that anyone interested in contributing to these guidelines would have subsequent access to the draft document. Email feedback to KAI Marine Services would be welcome during a one-month period.

This report describes in a summarized manner all the presentations given at these workshops using their chronological order, as well as the comments and suggestions given by all the participants. The structure of the document reflects the workshop organization, as each day focused on a particular sector, and therefore each day is treated in its own section in the present report. The speakers are presented in ANNEX 1.

1. OPENING OF THE WORKSHOPS

1.1 Official opening and introduction

Purificació Canals (chairwoman and keynote speaker, MEDPAN) opened the session and proceeded to present the rest of the panellists at this workshop regarding the role of Natura 2000 and the flag species (bottlenose dolphins and loggerhead turtles).

Carmen Mifsud (Malta Environment and Planning Authority) started by presenting the objectives of LIFE+ MIGRATE: assessing the status in Malta of two populations of protected animals mentioned above, as well as identifying potential sites of importance for these species.

Further, she identified all the partners of the project (Malta Environment and Planning Authority, which coordinated the project; Ministry for Sustainable Development, Environment and Climate Change; Kai Marine Services and the Bank of Valletta), having highlighted also that KAI Marine Services were a strategic partner, because of their previous experience in achieving the same goals in other Mediterranean areas, namely SE Spain.

Other points addressed were the budget allocated to the project, co-financed by the LIFE+ funding programme of the European Union, and all the predefined project actions. A special emphasis was given to the communication and project outreach actions, which reached several sectors of Maltese society.

Luke Young (Ministry for Sustainable Development, Environment and Climate Change) explained the Natura 2000 network, its aim and how it is connected with loggerhead turtles and bottlenose dolphins' conservation. He highlighted that management of Natura 2000 sites should be sustainable both ecologically and economically.

Having detailed that in Malta there are 28 sites of community interest and 13 SPA, he went further to explain why *Posidonia* seagrass meadows are important habitats to be protected in Malta, and how the two target species are important not only in Malta, but at an European level.

This speaker stressed that setting up Marine Protected Areas and Natura 2000 sites is fundamental for the future of Maltese species.

Stephanie Agius started by stating that no institution can look away from the environment. In that order of ideas, the BOV (Bank of Valletta) assumes a responsibility in dedicating funding, time and people to conservation projects e.g. preserving 3 million litres of water per year, planting 1600 trees and winning awards along the way for their funding and actions.

Conserving the Bottlenose dolphin and Loggerhead turtles helps conserving the identity of Malta, which adds to why the BOV is onboard the project.

Ricardo Sagarminaga started by thanking the project partners and started the

more technical part of the workshops, specifying as the Natura 2000 is about making development and biodiversity conservation compatible, a point made previously also by Mr. Young.

After starting by organizing closed 1 on 1 meetings with particular stakeholder groups, finally, at the present workshop, KAI Marine Services is opening the discussion to all stakeholders, with the global goal to ensure coherent and efficient Natura 2000 management.

KAI Marine Services used the same tools throughout the Mediterranean sea to gather coherent datasets across the area, and Ricardo gave examples of measures taken both in the areas fisheries and maritime transport to find win—win solutions and compromises to help conservation of target species.

He provided several figures about the amount of work and investment in the project, explaining the need for long term monitoring before one can find any significant trends.

He presented a list of methodologies, like *Soundtrap* recording stations and plastic debris sampling, just to name a few.

He explained the stakeholder involvement strategy, which aims to ensure that everyone involved understands and accepts future measures of conservation, this being an essential part of the project and the *leit motif* of the workshops.

Special challenges in this project were the mobility of turtles and dolphins, which travel through broad areas. Therefore, management needs to consider global conservation objectives before establishing baselines and selecting the actions to be implemented. Ricardo specified every step in the process, laid out the types of actions that need implementing, and showed the different levels of priorities being dealt with.

Mark Pace (Malta National Aquarium) presented the institution harbouring these workshops, going beyond the commercial nature of the infrastructures, by trying to collaborate with NGO's like KAI Marine Services, SharkLab and Birdlife. He welcomed everyone to the aquarium.

Ricardo Sagarminaga added that this institution conformed to the ethical needs of KAI's partners and future stakeholders in conservation, complimenting the MNA for not promoting events of dolphin captivity and contact with dolphins as other less ethical aquaria around the world.

1.2 Presentation of the project results

Presentation of the A3 &E13 project actions and project preliminary results

Ricardo Sagarminaga (KAI Marine Services) presented the A3 &E13 project actions and project preliminary results. GOBIUS Communication and Science were presented as organizers of the technical workshop, having Ricardo clarified the intention behind every sectorial poster (a set of seven was prepared by the

project), which is to make conservation from an all-inclusive approach, regarding stakeholders as stewards of conservation.

1.3 Panel I: Introducing Natura 2000

Adriana Vella (Conservation Biology Research Group, University of Malta) gave a global perspective of marine life and using the target species of the LIFE+ MIGRATE, whose distribution areas cover a wide geographic context, hence protecting these groups one can protect several ecosystems. She addressed the work of her home institution and pointed out several important issues throughout her presentation. She appointed the need to convert sectors as e.g. fishermen to accept turtles and dolphins as coexistent users of the marine environment, by setting up durable collaborations. “*Long term*” was an often-used expression, either regarding the length of collaborations with stakeholders, the need to gather high quality scientific data over a stretch of time, or to define the longevity of the target species. Proficuous collaborations were mentioned and the importance of communication, also to the scientific community, was re-addressed.

Questions & comments

Ricardo Sagarminaga thanked Ms. **Adriana Vella** and took the chance to reinforce the need of gathering detailed data like e.g. pollutants (opposite to just very visual threats like petrol tankers).

Natura 2000 Sites, What Does It Involve?

Ana Tejedor (KAI Marine Services) presented succinctly the Marine Natura 2000 site selection rationale, upholding the importance of not so recent directives like the Bird Directive and the Habitat Directive. She also referred to some legal details, like the similar value of inland and marine sites under these laws, or the responsibility of EU countries in determining and enforcing the protection of Natura 2000 sites within their respective EEZ.

Over 5000 Special Protection Areas have been created until 2013, around 10% of which are marine areas, 65000 km of marine area were covered and over 20 000 Sites of Community Interest have been created until this point. **Ana Tejedor** made clear that coastal Natura 2000 sites predominate when compared to offshore sites, and the work is still incomplete regarding the creation of these areas all over Europe and also within Maltese waters. Annexes on these laws should be adapted to the present knowledge, and new impacts e.g. underwater noise should be addressed in the near future.

Risk Mitigation: Presenting The Natura 2000 Guidelines Of Life+ Migrate

Ricardo Sagarmínaga analysed the risks, but also the many potentials inside each one of the sectors of maritime activity: Maritime Transport, Energy, Research and Conservation, Tourism and Fisheries. These potentials are to be cultivated and are a focal point in the present workshops.

The Spanish Experience Through The Life+ Indemares Project

Victor Gutierrez (LIFE+ INDEMARES, Fundación Biodiversidad MAGRAMA) briefly presented the background of this wide project, which covers 10 different main areas from deep-sea habitats to pelagic species and bird species. Again in these workshops, the need to involve the remaining of society outside the scientific community was mentioned, and therefore socio-economic studies of the fisheries sector were developed, in order to be able to promote management and monitoring guidelines within the sector. To promote the awareness of the general public was also a priority.

This speaker did not fail to mention every one of the many partners in the project and the overall budget. This factor is of importance, especially when dealing with offshore and deep-water studies, which require vessels and special equipment. Some of the figures presented were: 8 million ha covered, 120 oceanographic campaigns, 50 new species for science or for Spain, 3 new habitats were proposed to the Natura 2000, 10.000 species inventoried, individual sector impact assessment studies among several other studies.

Scientific and social consensus was achieved through Natura 2000 habitat descriptions, and management plans. The most impressive result of the project was a sharp increase in the marine area under protection within Spanish waters, now 8%.

Closing his presentation, **Victor** outlined that biodiversity as well as nature resources should be preserved.

Questions & Comments

Carmen Mifsud asked if any of the Macaronesian sites were protected because of cetaceans/turtles, and the answer was positive, as the Canary Islands are to be one of the most important cetacean occurrence areas even at a global level.

Another question was if the new habitats have been proposed or have been accepted, and **Victor** clarified that the habitats have only been proposed, and that the EU commission has showed some precaution towards their acceptance for the moment.

Carmen Mifsud read a EU statement of a press release done in Nov 2012 naming Malta as the foremost contributor to Natura 2000 marine areas (compared to its area). These MPA's protect over 85% of the *Posidonia* seagrass meadows.

1.4 Panel II: Natura 2000 in the Mediterranean Context.

Networking In The Mediterranean: The 2012 MPA Status Report And The Roadmap For 2020

Purificació Canals (Network Of Marine Protected Area Managers In The Mediterranean, MEDPAN) started by addressing the status of MPA's in the Mediterranean. Around 4,56% of the Mediterranean surface is included under some kind of protection. Only 1,08% is however protected outside the Pelagos sanctuary in the Ligurian Sea. That is far from the threshold of 10% established by the convention on biological diversity.

There are 170 designated MPA's, and 507 Natura 2000 sites, 4 fisheries restricted area (GFCM), and also zones of deep-sea trawling ban (everything below 1000m depth). It's quite interesting that 55 new Marine Protected Areas are taking their way to implementation, mostly in areas with little protection.

There is an uneven distribution of Marine Protected Areas, as most are on the northern basin and the big majority are coastal, not offshore, and there is also a weak representativity of habitats and species.

On another hand, present management is not considered sufficient, especially outside the EU countries. Enforcement regulations are restricted to 25% of the considered MPA's. There are weak financial resources to cover recurring costs.

There is also the need for capacity building and economic studies.

Ms. **Canals** portrayed an example of networking promoted by MEDPAN. The Mediterranean MPA Forum was held in 2012, in Antalya, attended by 300 people, and was organized in some months only, showing that collaborations and exchange of information can be achieved. Its main objective was to bridge the gap between field actions/political commitments/science. It has been a unique opportunity for dialogue among stakeholders, contributing to better-informed decisions and efficient implementation of urgent action towards International, regional and European commitments by 2020.

A roadmap is being prepared in this regard, that aims to define steps that Mediterranean states and relevant organizations could undertake to achieve the Aichi targets, addressing all levels of stakeholders (local, national, European, Mediterranean and internationals), favouring communication either inside and outside countries.

The history of MEDPAN was addressed, referring to its *bottom up approach*, as a project with common actions that were implemented by several partners. The governance of the network was developed in the meanwhile. Nowadays, it is a permanent and legally independent structure, representing over 80 MPA's, having 50 members (having started with 8), 32 partners, all from a total of 18 countries. This network is being financially supported by donor organizations, which were enumerated. Several strategic partners, which are of major importance, as long as synergies avoid overlap and competition. Finally, the MEDPAN was characterized in its strategic axis and intervention areas.

Questions & Comments

Ricardo Sagarminaga commented that MPA's are one of many tools, but we need management at larger scales. ACCOBAMS is one of the initiatives that is trying to accomplish this.

Protecting Cetaceans In The Mediterranean Sea

Cèlia le Ravallec started by describing ACCOBAMS, (Agreement on the Conservation of Cetaceans in the Black Sea Mediterranean Sea and Contiguous Atlantic Area) is a cooperative tool for the conservation of marine biodiversity in the Mediterranean and Black Seas, which was adopted in 1996 and entered into force in 2001. It was established under the aegis of the UNEP/CMS convention on Migratory species, and its purpose is to reduce threats to cetaceans. The ACCOBAMS area extends from the Portuguese and Spanish EEZ's on the West to the Levant Sea and Black Sea in the East and it involves 23 contracting parties. The main threats to cetaceans were summarized, after which the ACCOBAMS conservation plan, which requires its Member States to implement it in order to achieve and maintain a favourable conservation status for Cetaceans, was explained. Further measures, addressing the impact of anthropogenic noise, or mitigating the impacts of fishing activities, were also explained. Finally, **Cèlia le Ravallec** talked about the ACCOBAMS survey initiative, which started about 10-12 years ago, aiming to survey the whole area in a short span of time, in order to adapt the conservation programs to the actual status of the species of cetaceans. This project is to be implemented by the member countries.

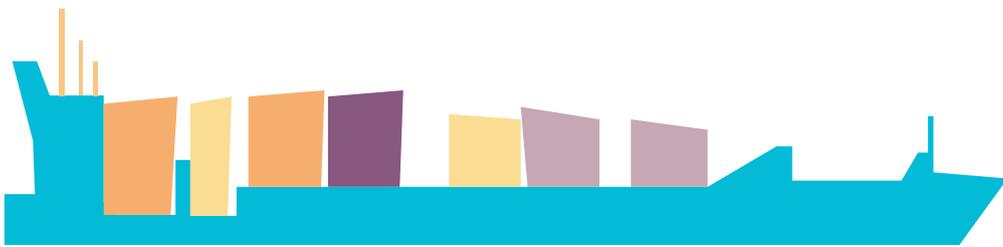
Towards A Comprehensive Network Of Mpa's In The Mediterranean

Souha Elasmi (RAC/SPA Programme Officer) presented key statistics regarding the Mediterranean compared to the world. Next, she mentioned the MAPAMED database with qualitative and quantitative data available online, and went on to talk about an assessment of the current MPA system of the Mediterranean. Again, regarding the ecological coherence of the MPA's, some of the asymmetries already spoken of during the day were noted. A visual analysis is enough to reveal uneven distribution of MPA's, weak representativity of habitats and species and weak connectivity (as derived from models). The Barcelona convention includes 32 SPAMI's (Specially Protected Areas Of Mediterranean Importance) that are mostly located North and West within the region. Showing the Mediterranean marine ecoregions, the lack of representativity of the habitats in the present AMP's becomes obvious. Furthermore, most protect the infralitoral leaving the deep and benthic habitats out. The coralligenous habitats (5% protected within AMP's), the canyons (3%) and seamounts (3,5%) are also underrepresented. 90% of the species are represented in the MPA's, (leaving 14 out of 146 out). Connectivity between MPA's should be higher (25-30 km between MPA's ensures good connectivity). Towards developing the MPA network in the Mediterranean, a regional working programme for the coastal and marine protected areas is being put in place, RAC/

SPA has been producing efforts to set up new MPA's: in the next few years 5-9 new declarations of MPA's are expected, and a dedicated set of guidelines has been developed to reach this goal. Finally, **Souha Elasm**i also praised the good efforts of regional conventions and agreements that have been established in the last few years, naming them in detail.

Questions & comments

Ricardo Sagarminaga mentioned the auspicious developments in cooperation between bodies and institutions, using the action plan to the conservation of the common dolphins as an example of synergies.



2. SECTORIAL WORKSHOP – TRANSPORT AND ENERGY

2.1 Official opening and introduction

Session began with **Ricardo Sagarminaga** presenting Mr. **Miguel Palomares**.

Introducing The Life+ Migrate Sectorial Workshop On Transport And Energy

Miguel Palomares (Former Director of MEPC-IMO) put the LIFE+ programme, the LIFE+ MIGRATE project and KAI Marine Services in context, and addressed the responsibility of all sectors of society regarding conservation. He stated the goal of the workshop and gave the floor to **Ricardo**.

Life+ Migrate Natura 2000 Guidelines – The Process

Ricardo Sagarminaga introduced the workshops as a part of a process beginning in a set of survey and stakeholder meetings, continuing into closed workshops with the stakeholders, and culminating in these sectorial workshops.

The Natura 2000 and the Habitats directive were described as interesting and powerful tools working towards conservation.

KAI has implemented a set of methodologies before in Spain towards the same objectives and, within the assumption that these should be repeated throughout the Mediterranean zone in order to have regional coherence in results, the organization declares its suitability to develop these methods in Maltese waters. A very important part of the process was KAI's effort to develop a stakeholder involvement strategy, empowering stakeholders having the advantage of shared responsibility (ownership) to ensure protection of the environment.

Ricardo detailed the project's actions, the stakeholder involvement strategy, the Natura 2000 guidelines proposal. He presented *risks* and *potentials* within each sector, a baseline to all discussions throughout these workshops.

Finally, the issue of using Natura 2000 sites to protect highly mobile species was approached, and while these areas might become essential feeding, breeding and migration habitats of these species, they are not enough by themselves, and other measures of conservation are thus required.

2.2 Framework and Case-studies

Finding Synergies Between Natura 2000 And The IMO

Ana Tejedor presented a case study, giving an example of the pragmatic approach that led to reconfiguration of maritime traffic around the Alboran Sea Natura 2000 Sites, where very high collision risks existed (70% of the world maritime traffic). It was overall a quick process, and since then similar initiatives took place in the USA and Canada. This process resulted in a paper in the Journal of Marine Policy in 2012.

Questions & Comments

Carmen Mifsud asked how strong was the scientific evidence to be able to move the maritime traffic?

Ana Tejedor replied that after 20 years monitoring cetaceans in the area, there was strong scientific evidence, as a posterior presentation would show.

Ricardo added that working from the perspective of the shipping companies helped in finding win-win solutions, and, as a matter of fact, calculations of change in fuel consumption predicted a small reduction, as well as the new route actually simplified the navigation.

Marco Portugese (Strategic Fleet) asked how far does Natura 2000 go in conservation, because animals move and maybe the mobility of the species might demand spatial shifts in Natura 2000 sites (adapting the present protection).

In reply, **Ricardo** gave the example of the USA, which are spending c. 1 million in conservation plus 1 million in cooperation in order to ensure protection outside their waters. He also said that some areas have been planned big in order to cover all the potential sites and that might be an appropriate approach when possible.

Carmen Mifsud added that Maltese Natura 2000 sites protect mostly habitats (reefs, *Posidonia* meadows) and do not focus on mobile species.

Ricardo mentioned that studies have to complement site protection in finding scientific data for species conservation.

Ricardo presented *Whale Alert* as global tool, as needed for safeguarding sea turtles and cetaceans from navigation collisions.

Whale Alert – Conservation In The Cloud

Virgil Zetterlind (Conserve iO) presented his mobile application, *Whale Alert*, released 18 months earlier, running in Apple™ tablets and iPhone™, targeted because these are the most commonly available computing devices in the world. He went on to present some examples of the implementations and advantages of *Whale Alert*. Presently it is implemented in the East coast of the USA and Canada. users can report whales and collect opportunistic data in a live manner. The application redirects users to relevant information towards actions to be made (and restrictions), shows geographic info (tapping the areas will display regulations and restrictions and additional information e.g how to approach any whale).

The *Whale Alert* framework was developed at a global scale although presently its functionalities are still geographically restricted. He also presented another

application: the *Spotter Pro* app, which targets advanced users (trained scientists). It has several interesting potentials, like e.g. sending email alerts with turtle sightings. All data from observers is received in a single server, easily available for data queries.

Questions & Comments

Natacha Aguilar asked where and who is storing the data. “What about if researchers want to extract the data”, she asked.

Virgil Zeterlind answered that I/O Conserve owns the server and is able to define shared agreements with all the existing partners about who can see and receive data (especially on the *Spotter* app, *Whale Alert* is more open). Some data is made available freely to the public.

Natacha Aguilar went further to inquire if entities which request data are given access to all the database, and posed the problem of public access to data which could allow unregulated ships to pursue cetaceans (causing disturbance).

Virgil Zeterlind detailed that access rules are still under evaluation, and suggested that delaying access to cetacean locations could easily safeguard the animals wellbeing, by allowing them to move beyond the sighting location, while still maintaining the data public.

Ricardo Sagarminaga asked if *Ocean Alert* app goes beyond *Whale Alert*.

Virgil Zeterlind then clarified that the *Ocean Alert* app regards all species and sorts of marine hazards. *Whale Alert* is a starting point for *Ocean Alert*, allowing for user selection of more relevant issues to be shown on the application.

Ana Tejedor inquired if there was a differentiated data access protocol for specific sectors (i.e. if certain users access specific data only).

Virgil Zeterlind said that at server level, there are multilevel permissions that could be set at will.

Carmen Mifsud asked if I/O Conserce has already initiated any protocols with e.g. ACCOBAMS and other entities that already work at regional levels.

Virgil Zeterlind answered that not yet.

Gabino González inquired if there was any contact with ACCOBAMS or UNEP to define strategies and discuss details, and **Virgil** confirmed that they had.

Cetaceans And Sea Turtles In Maltese Water: Potential Impacts Derived From Shipping. The Risks Of Ship Strikes, Noise Pollution And Invasive Species

Ana Tejedor characterized the maritime traffic sector and its impacts on biodiversity. From there, she talked about the regulatory framework: SOLAS and ISM, MARPOL, STCW, Ballast water regulations, antifouling regulations, etc. She pointed out that major oil spills have been reduced in the last 40 years, but still the annual average for spill are estimated at 700 ton. The IMO resolutions A.893(21) November 1999 and the A.25/res. 999 January 2008 were highlighted. Then, the mitigation of shipping impacts on Natura 2000 was addressed, by talking about the experience through the LIFE+ INDEMARES project in dealing with many specific issues: noise, ship strikes, *Particularly Sensitive Sea Area & Special areas (PSSA & SA)*, alien species and marine litter. She highlighted that, as pragmatic solutions are being searched for, it is fundamental to understand the tools within the sector that are useful to address a certain problem.

Questions & Comments

Gabino González asked how was the comparison between the effect of PSSA & SA on different types of pollution, and **Ana Tejedor** answered that before and after PSSA & SA implementation, there was a bibliographic review and consideration of data from the captains and from the PSSA & SA Towers.

Carmen Mifsud inquired what were the objectives. Ana Tejedor then clarified that INDEMARES did not aim to propose PSSA or SA but to develop Natura 2000 sites, but because sea traffic was an important factor to Natura 2000, so the PSSA & SA were tools to assess some variables in the areas where Natura 2000 sites were to exist.

Miguel Palomares commented that for innocent passing of maritime traffic Natura 2000 sites are not enough to protect from the impacts of the sector, and the definition of PSSA & SA is needed.

The Risks Of Oil Spills In Maltese Waters And The Posow Project

Mr. Vincent Attard started by addressing the high sensitivity of the Mediterranean to oil spills, due to the high density of ships travelling through its waters (25% of all maritime traffic worldwide). On the other hand, offshore drilling in Mediterranean is very popular, and therefore, an oil spill would affect cetaceans, turtles and other wildlife around the Maltese islands. He pointed out that many turtles which are recovered by NGO's usually have oil, and went on to describe how to some animals are likely to be affected by spills. In a Maltese context, spills on the southern coast are challenging to clean due to the inaccessible rugged coastline, while spills reaching the northern coast are prone to affect tourism. No doubt, international help would be indispensable to tackle any event. He presented the POSOW project, a volunteer-based approach to help

tackle oil spill events together with the civil protection department, providing trainers and national volunteers training courses, management of volunteers, oil shoreline assessment, wildlife response operations, as well as managing a database of volunteers, who will work under the guidance of the relevant authorities. The talk mentioned the POSOW partners are institutions from the European countries around the Mediterranean coast, whose responsibilities and capabilities were described.

Questions & Comments

Ana Tejedor asked if, within the knowledge of the speaker, Malta is prepared to attend these threats within natural reserves and Natura 2000 sites. His reply was that Malta is not completely prepared at the national scale, as there is still some coordination lacking between NGO's and the companies, for instances, but there is training addressing certain Natura 2000 habitats (e.g. sand dunes).

Tackling Oil Spill Emergencies In The Malta Channel

Aldo Drago (University of Malta) presented the Physical Oceanography Unit from the University of Malta, and reinforced the notion of the risks of an oil spill within Maltese waters, due to the intense maritime traffic in the Mediterranean, including oil transport. He made note of the strong currents around the Malta channel, but clarified that tests using drifter buoys show that these can circulate and stay in the area for several days. In fact, this suggests a spill could hit the island repeatedly, and the risk is increased by the fact that a spill in Sicily or southeast of Malta could reach Maltese waters. Mr. Drago mentioned the contributions of the Physical Oceanographic Unit in forecasting (information on a spill regarding the several variables that act together) to determine if it hits Malta, and upheld the importance of very reliable weather forecasts and oceanographic forecasts, especially because Malta, being at the edge of the shelf, is subject to particular phenomena and therefore has complex currents, which are very irregular in direction.

To address all these concerns, the CALYPSO project provides data around the clock automatically and independently, using HF radars. One of its tools is the MEDSLIK three-dimensional oil spill model, which is able to predict fate and transportation of an oil spill within subregions of the Mediterranean.

In order to improve mitigation, a current project, the MEDESS4MS service, aims at aiding prevention of maritime risks at a Mediterranean scale, integrating multi model oil spill prediction capabilities. The talk went on to detail many of the characteristics of these tools.

Questions & Comments

Natacha Aguilar made notice of how impressive the modelling behind these tools was, and asked how many oil spills have existed in Malta in the past. The answer was that no spills have been recorded in the last five years (since project

CALYPSO started). Additionally, **Aldo Drago** mentioned transport Malta simulation exercises are run every year as well as tests to the efficiency of the models and simulations.

Natacha Aguilar also inquired if there was any use of the models towards prediction of accumulation of marine debris, and the answer was that there are exercises using floating materials to predict the routes of such debris.

Gabino González added that the high reliability of these models have been shown in a previous spill, as predictions fitted reality very closely.

Natacha Aguilar commented that these models are also useful for connectivity studies of populations through larval dispersion.

The Risks Of Oil & Gas Exploration And Exploitation

Natacha Aguilar started by addressing the importance of holistic evaluation (giving examples of global and local level types of evaluation usually performed) and addressed the impact on cetaceans of processes working from the global (e.g. climate change) to the local scale (e.g. acoustic and chemical pollution). She went on to speak about the phases of oil-gas extraction projects and detailed the sorts of impacts these projects have on cetaceans, using study results as examples. Low frequency noises, as well seismic activities, were shown to have diverse effects on animals (not just cetaceans, but also ecologically related species like giant squids, fish larvae and other mammals, like humans) and natural resources (fisheries). Further details were given on the impacts of drilling, some of which might be hidden from plain view like deep water spills, and the issue of who pays for the economic costs of accidents involving these activities was raised.

Questions & Comments

Ricardo Sagarminaga commented that some companies working in countries with good legal framework can develop a “cleaner” exploitation (e.g. New Zealand) while in countries with less regulations (e.g. Nigeria) the activity is much more dangerous. The necessity to work with the best technology and resources available was highlighted.

Natacha Aguilar added that mitigation is important and stakeholders should know the risks and work together, keeping an eye open for technical developments in the area.

Risk Mitigation And Management Measures. REMPEC Actions

Gabino Gonzalez made an introduction of the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC), an entity

working within the framework of the Barcelona convention, and described the institutional and legal framework. He also described REMPECs activities in some detail.

These include the prevention of illicit discharges from ships (and even prosecution of offenders), the improvements of maritime organizations set-up, fighting invasive species (a threat to biodiversity, and a global issue), national and sub-regional contingency plans to respond to oil spills, training and exercises to test plans, dissemination of information (in french and english, through regional information systems), maritime traffic risk assessment in the Mediterranean region, developing environmental and socio-economic sensitivity maps, addressing “special area for cetaceans”, preparing an action plan for the implementation of Barcelona convention offshore protocol in the Mediterranean, and others.

Questions & Comments

Natacha Aguilar mentioned that recently there are many efforts to reduce noise levels from shipping, and asked if REMPEC is having a part in these efforts?

Gabino González answered that not yet, because REMPEC has a very small team but made a point of saying it will be considered in the new strategy, as well other issues like gas emissions from ships.

Miguel Palomares took the chance to praise the amazing work of the REMPEC before giving the floor to the next talk.

Risk mitigation and management measures. ACCOBAMS and MSFD work

There are a number of guidelines all over the world, some are discussed, some are restricted and others are available for the public. **Claudio Fossati** and his team have been working on guidelines for more than 10 years and also applying guidelines for the US government. In their work, they have been conjugating the scientific point of view together with the practical implementations. The talk focused on some of the practical aspects of preparing guidelines. Some aspects (like the effects of noise on marine life) are not fully understood, hence these guidelines must have in mind that people work under those guidelines. **Claudio** highlighted the need to focus on the grey areas to avoid mistakes and misjudgments, to specify regarding mitigation or management point of view. For example, it was said that to use a precautionary approach leads to grey areas, which creates confrontations. Since contexts are varied, each with its own peculiarity, and guidelines must specify according to the application area, avoiding philosophically and scientifically contentious points was also deemed important when developing guidelines. Applying the laws and effectively applying mitigation measures are two different things, the latter being most important.

Questions & Comments

Carmen Mifsud, regarding the latest guidelines by ACCOBAMS, which put forward many mitigation measures, asked if **Claudio** could tell if any of these had implemented successfully in the Mediterranean.

Claudio Fossati said the Italian government is being pushed to adopt its own guidelines instead of NATO guidelines, which are probably implemented more effectively by most of the governments in the Mediterranean.

Mitigation Measures To Reduce Ship Strikes Worldwide: An Overview

Jérôme Couvat talked about the increase in ships strikes in the world and also the Mediterranean, something which carries ecological, economic and human consequences. He made a very comprehensive description of technological, educational and regulatory solutions to the problem. Afterwards, Jérôme presented a Mediterranean initiative called REPCET, a programme which provides real time plots of cetacean occurrences to ships. This collaboration software has been installed in 13 ships within the Mediterranean, plus 3 land stations.

It is analogous to *Whale Alert* (presented earlier in the same day) with some differences. Just to point out a couple of singularities in REPCET, it includes signalling of floating threats to navigation, and it defines danger areas that take into account the swimming speed of animals. This programme also provides training to crews to identify the whales. Concluding the presentation, it was highlighted that although there are many alternative and complimentary measures, no perfect solution exists among them, but combination of technology, education and regulation can go a long way if taken in close collaboration with the shipping industry and other marine sectors.

2.2 Discussion of the Natura 2000 Guidelines

Natura 2000 Guidelines Drafting

Ricardo Sagarminaga opened the discussion on this topic (Session 3) by reinforcing the risks and potentials of the maritime transport sector regarding mammals. For instance, he made note that because mariners already use tools to address marine traffic safety, and using safety as an justification to implement measures that would help avoid ship strikes with cetaceans maybe counterproductive. He addressed the peculiarities of the sector, considering the transport sector easy to work. So far the workshop focused on the risks, but there is the need to look at the opportunities... Some shipping companies are platforms for opportunities, which are interested in working with scientists because these also work at sea and look at the biological perspective. Regarding

the technological tools presented during th day (*Whale Alert* and REPCET), he said technology is increasingly effective and evolving fast, and costs can be pushed down when presenting developers a potential market.

Ricardo presented the Natura 2000 guidelines drafting process. The present guidelines are to be seen as a working document and there is the need for suggestions and remarks from the participants in the workshop.

Natacha Aguilar praised the MEPA for producing good efforts and supporting documents to continue improving the protection the Maltese waters. Hopefully, she said, people will be proactive and will give comments and suggestions.

Ana Tejedor conveyed her hope that the present guidelines document could supply the necessary information.

Carmen Mifsud proceeded to ask to use an editable document format (e.g. WORD) instead of a PDF, and went on to suggest several changes and issues to be addresses in the document. These were:

- page 56: one should specify the source of data when stating a “high risk of collisions” and other statements e.g. “dolphin collisions are unknown”, “damage to turtles is occasional”; Is it an assumption regarding the high boat traffic in the area or statistical evidence?;
- Other problematic statements should be clarified as “no harassments were registered”;
- The mention of measures like using fish instead of squid to minimize turtle bycatch on surface longlines needs readjustment, as virtually all longlines in Malta already use fish, which is cheaper.

Natacha Aguilar reinforced the need of people with doubts to present them following the previous example, in order to make the session more dynamic. She has also suggested MEPA should implement a system not only to record strandings but sightings.

Carmen Mifsud first mentioned the collaboration of volunteers, even the Armed Forces of Malta, which provide sighting data to MEPA already. Regarding the guidelines, she posed the question that if these guidelines should regard specific spatial areas or not.

Ana Tejedor clarified that all guidelines are to be implemented in general areas, as the Natura 2000 site identification must be made just on scientific premisses, and management concerns must be taken into account at a posterior level. Ana Tejedor urged the participants to submit further doubts and suggestions electronically through email in the following month or so, if not at the session.

Carmen Mifsud inquired what would be the time limit to submit any suggestions

and questions, and the reply was that the KAI team would give feedback on this issue by email to make sure all details are taken into account. The ideal period to receive feedback on the guideline document would be within 2-3 weeks, so that a final product can be obtained by December.

Natacha Aguilar asked how is the Malta government approaching IMO regarding noise, and **Miguel Palomares** said that individual countries will have a great effect on the IMO resolutions (Spain, Malta, etc), and it takes the preparation of the full documents (for which these guidelines are a good departure point) to be presented to the IMO in a formal way. He also stated that informal requests for attention usually do not go a long way.

Carmen Mifsud mentioned the inconvenience that MEPA has little capability to reply to IMO, an entity which should be addressed by Transport Malta officials only.

Miguel Palomares gave the example of Spain, where the interlocutor of the Spanish government with IMO is the Spanish Transport Minister. When anything emanates regarding the environment, there is a document sent to the Spanish Transport Ministry to relay it to the IMO.

Ana Tejedor highlighted the importance of relaying a very focused message (with sharply defined key points) so that the responsible authority pays attention.

Miguel Palomares warned that if the intentions are proposing a mandatory measure, then it should be difficult to have a reply; if it is not mandatory, then it should be more easily received by the IMO.

Carmen Mifsud inquired if the LIFE+ MIGRATE has any hard scientific evidence capable of putting forward any measures on maritime traffic (e.g. as it happened in the Alborán Sea).

Ana Tejedor said that until then no data seemed to demand a mandatory measure by the part of IMO.

Natacha Aguilar defended that very concrete evidence towards the need to implement measures is the amount of boat traffic in Malta. She backed it up with the fact that it was very difficult for her, during her fieldwork, to record any underwater sounds without background noise due to shipping. She addressed the concept of “acoustic fog” (an analogy coming from the use of sound by cetaceans to see underwater) to define the sort of problem created by shipping noise to marine mammals. She also spoke about the responsibility of countries with dense boat traffic to push a little bit further in these issues, as noise can affect even fish (including during its larval stages).

Gabino González asked if there is enough scientific evidence to backup any global changes in maritime traffic (regarding noise levels).

Claudio Fossati talked about the problem of having studies comparing the impact of today's increased noise levels vs. natural noise levels because shipping is global, and finding case studies to back up changes is very difficult, perhaps almost impossible. Having that impossibility in mind, he suggested that it maybe useful to bring data from other areas.

Natacha Aguilar exemplified that in North Atlantic, Canada implementation of lower shipping noise immediately reduced stress hormones levels, benefiting the health of whales from local populations. On the other hand, spermwhale dives monitored in Italy (where the underwater noise levels are higher) showed a very reduced number um prey capture attempts compared to regular dives. She suggested that maybe collaboration between Italy an Malta might get data presently to compare with a potentially more silent future. She added an IFA report suggests that since the larger vessels produce much more noise than the rest, so reducing the noise from these boats might contribute largely to reducing total background noise.

Claudio Fossati warned that these views are obvious for scientists but create grey areas for stakeholders and lead to endless discussion, if precautionary measures are taken with no further studies. He mentioned a study done by his institution, where a fixed station on land compiled a list of noisy vessels, ranking them in terms of noise emissions, and subsequently provided this list to companies, also aiming to give to give a “green label” to silent vessels, or alter regulation to reduce speed of loud vessels.

Miguel Palomares warned about the fact that propellers are what produces noise in ships, and because of their expensive nature it might be impossible to convince ship owners to re-equip their vessels. Discussion should focus instead on fitting brand new vessels with more efficient/less loud systems.

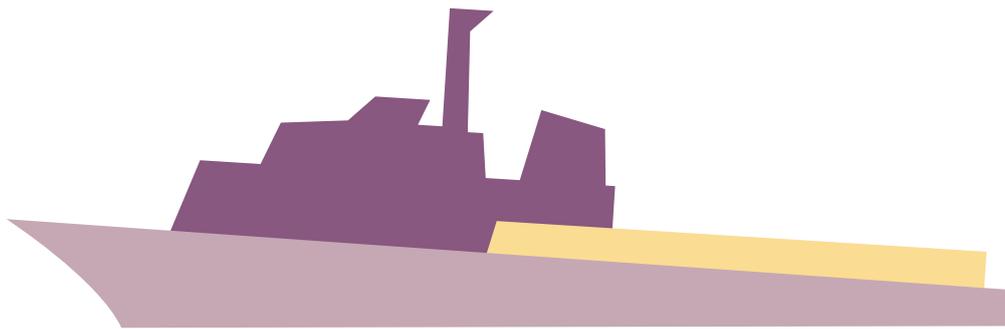
Emanuel (Civil Protection) added that technology is changing and new ships need to be more efficient in every way, therefore less noisy, as part of the technological evolution of shipping.

Miguel Palomares agreed, but asked what to do with the many years until the old ships all leave the seas? It was reinforced that, in the meantime, it is virtually impossible to convert the present ships, repeating the idea that change can only come from a pragmatic approach, while **Natacha Aguilar** warned that inertia in industry is always present, but the evolution process must start at some point, and reinforced her view that pressure must be made through the IMO to change the state of the industry in what regards underground noise.

Day 2

Ana Tejedor stated the importance of having IMO taking the lead with their guidelines regarding maritime noise, just before Miguel Palomares thanked everyone for the fruitful discussion and closed the session.





3. SECTORIAL WORKSHOP – SECURITY AND SAFETY

3.1 Official opening and introduction

Natacha Aguilar opened the workshop and introduced the speakers, together with the agenda for the first session. She said that people usually think it is impossible to reconcile sectors like industry and others with the conservation of nature, but KAI Marine Services has been able to put all the stakeholders in dialog to improve the way things are done, because we have to share the world with different animals, not only because of ethics or beautiful but also because our ecological relation with other species.

Natacha Aguilar thanked the Armed Forces of Malta for participating in something unexpected, but that also makes sense from the perspective that the role of the Armed Forces is to defend the country, but that it includes the natural environment as well.

The Roles Of The Armed Forces Of Malta In Protecting Marine Life

Major James Grixti (Armed Forces of Malta) presented himself, and following described the organization of the Armed Forces of Malta, which is a combined service force, without a separate navy or army, for instances, but naval, terrestrial components and others. He also described their primary defence roles, as well as the peculiarity of the Armed forces also being assigned the powers of customs or Malta Police force at sea. The Major spoke about the Maritime Squadron and its strategic missions, as well as its zonation (areas of different responsibility and legislation). Further details were given about the fleet (which includes 15 vessels of various dimensions) and other maritime operational abilities, and then the Maltese air operational abilities (which derive from 4 planes and 4 helicopters) were addressed too, both in terms of response speed and range. The main point of the presentation was describing AFM roles in the protection of marine life in Malta and beyond, protecting marine conservation areas around the archipelago and enforcing laws of several types everywhere but also around specific reserves (as Fifla islet) and wrecks. Sighting reports of several animals, from jellyfish to turtles and cetaceans, including several variables regarding the sighting (time, location, species, etc.) are gathered and compiled. The Armed Forces also rescue injured and entangled sea turtles, passing them on to MEPA. The Maritime Squadron does not have any naval sonars, nor do the forces use underwater explosions, so it is quite environmentally friendly. Operational statistics were also specified. Interesting numbers include 250 inspections on board of vessels controlling overfishing *per anum*. Some interesting results were mentioned: since 2007, Blue Fin Tuna infringements decreased by 60% and there was also a decrease of 65% of illegal fishing by fishermen, while there is a 40% increase in illegal fishing from recreational/sport vessels.

Questions & Comments

Claudio Fossati asked if the AFM have a database with marine life data, and if it is open, and the Major replied the AFM might share their internal database with any organizations that request this information.

Natacha Aguilar departing from an example in Spain, where bycatch of turtles by trawlers apparently created “decompression disease” in 40% of turtles captured, asked if there were any records of the same condition in turtles recovered in Maltese waters by the AFM.

Carmen Misfud informed that no significant bycatch from trawlers is known except from isolated cases some years ago, mostly because trawlers operate in deep sandy areas not suitable for turtles. **Major James Grixti** clarified that usually when the Armed Forces encounter a turtle at sea it is handed over to MEPA to identify the cause and take care of it. Most often when a turtle is seen it is at the surface, being obviously dry and static.

Ricardo Sagarminaga talked a little more about the subject, describing that comatosis in bycatch by trawling has been known, but it only happens in certain circumstances. He also said that Malta does not have much trawling. And he added that turtles that are not able to dive are not necessarily sick, but could be just resting at the surface and they might not be able to dive (due to natural processes).

Natacha Aguilar mentioned that fisherman that feared punishment and did not declare turtle bycatch, increased their bycatch reports when approached in a positive manner (rewarding reports with e.g. a hat) and a potential problem was identified, allowing for mitigation measures to be put in place. She proceeded to suggest that the Maltese Armed Forces could have a similar positive approach with fisherman in order to optimize their reporting.

Major James Grixti said they have been collaborating often with MEPA, and that the AFM are trying to increase awareness and to provide training and guidance to officials on how to handle turtles and other species.

Mrs. Louise Tanti also mentioned some of the distributable materials (in this case, a booklet about fisheries and turtles in Maltese) distributed by MEPA, regarding Natacha’s suggestion on using a positive approach to motivate fishermen to hand bycatch data to the authorities.

Carmen Misfud acknowledged this example. Next, she congratulated the AFM for enforcing laws e.g. around *Posidonia* “meadows”, and conveyed her expectations there would be space for further collaboration regarding other species, since standing collaborations protocols are so good. She clarified, regarding Natacha

previous suggestion, that some legislation states that a fisherman who catches a turtle accidentally may land the turtle and request for reimbursement for the lost fishing crafts, so in a manner this is a potential compensation for landing bycatch turtles (within some limits, as there is no interest in having fishermen capturing turtles).

Surveillance And Mitigation Of Natura 2000 Values With Respect To Naval Exercises. NATO (NURC) Guidelines To Protect Cetaceans In The Mediterranean Sea.

Claudio Fossati started by talking about the absence, within the shipping and industry sectors, of a universally accepted link between airguns and damage to animals. Within the navy sector there is a strong evidence of an established link between sonar and death of sea animal (e.g. mass stranding of beaked whales in Greece). He presented a document of mitigation procedures created by the NATO Undersea Research Centre (NURC) (which is the only publicly available protocol regarding this issue.) He talked about the advantages and disadvantages of the NATO collaboration in this regard.

While there is terrific support in beaked whales knowledge, as the North American Navy puts an enormous amount of money in research; working with the best equipment available (vessels, facilities, supercomputers, acoustic equipment, etc); on the other hand, NATO research involves secret tools which are not allowed to be seen by civilians; it is not possible for a regular scientist to implement mitigation procedures, just allowing for military personnel; during real navy's exercises is impossible to monitor everything, and there is no room for civilians, with the additional backside of not having specifically trained personnel doing the research tasks. He outlined the highlights of these NATO guidelines. He also addressed the fact that in the two previous years, the NATO exercises caused deaths to beaked whales, and suggested hypothetical reasons why NATO would ignore their own guidelines: 1) disconnection/ lack of communication between departments or 2) low priority given to conservation of cetaceans compared to testing sonars. He also referred to the European situation regarding the issue of impact of military sonar on marine mammals: every navy has its own policy, which is usually not available to the public.

Regarding the recent developments in the relation between the scientific sector and the Defence sector, **Claudio Fossati** mentioned the Undersea Defence Technology Workshop, where commercial companies sell material to the defence sector, and some scientists were invited to be part of it, suggesting something is changing. Another topic was that European militaries are developing cooperation efforts to avoid overlap and one of the projects was focused on marine mammal protection. The speaker spoke about how his team provided a tool / database with the main cetacean areas to be avoided with the European defence bodies through the Italian navy - the PoMM initiative.

Questions & Comments

Carmen Mifsud asked if there was possible to obtain dates of military exercises performed by the Italian Navy in the Strait of Sicily, as there might be overlap with previous cetacean strandings (3 and 8 years earlier).

Claudio Fossati informed that the dates are public as exercises have consequences, e.g. restrictions to navigation. Some other data is sometimes available, (e.g. types of vessel). On the other hand, he said dates are known in advance allowing for preparation from the conservation authorities.

Carmen Mifsud inquired if it is possible to ask for alterations in the exercises.

Claudio Fossati conveyed how difficult this process might prove to be (in a country like Italy), at least for universities and NGO's. It may take months to pass on recommendations to the navy or to NATO. Nonetheless, a government organization might have different channels to get the information to the right interlocutor.

Natacha Aguilar advocated that the international scope of Malta, due to its strategic position, allows the maltese government to receive information on activities by other navies. Maybe that will allow for recommendations to be made so that the best available protocols are followed in exercises that might affect animals within the wide area of Maltese influence, especially because Malta does not use sonars and does not perform tests of the sort.

Impacts Of Acoustic Pollution Derived From Naval Exercises On Marine Fauna

Natacha Aguilar introduced her talk by addressing the point that Naval exercises take place all around the world, using sonar and live fire, and added the fact that mass strandings of beaked whales also take place globally. This diverse family of cetaceans is the most sensitive group to acoustic sources like sonar. In the Mediterranean, while numerous tests coincide with strandings of beaked whales (dates are mentioned in the ACCOBAMS report), one must consider also that some offshore tests may not allow for affected animals to reach the shore and the impacts of tests to be detected. She considers that there is an obvious need to take actions and avoid tests within beaked whale areas, unless extreme situations (war) demand for the use of sonar. She detailed that beaked whales are not protected except for the HABITATS directive, (and Canadian law), so there is no way to assess their need for protection. Furthermore, knowledge is extremely scarce (some wide ranging species were known until recently only by bones). She highlighted that the same piece of sonar equipment has been used in all the strandings of beaked whales. One example is the Cuvier's beaked whale capacity of reaching down to 2000 meters depth, at the limit of their physiological

capabilities, so any stress response (e.g. to extreme sound) might go beyond their physiological threshold to resist to depth, hence causing decompression disease. Groups of beaked whales are very cohesive using sound (Natacha explained the sort of clicks and whistles) to coordinate feeding underwater, even if they are still silent near the surface, possibly avoiding detection by killer whales (predators). Since they have a low metabolic rate in their deep long dives implies they cannot escape threats fast. She showed how beaked and pilot whales use different dives, with pilot whales doing shorter dives (20 minutes vs. 1 hour and a half) and with less prey capture attempts. Also, the ascents profiles of beaked whales are shallower (possibly avoiding predation by orcas as they go up silent for almost 1km since their deepest). Since sonar sounds are similar to killer whale sounds, beaked whales might have a very strong stress response to sonar because of that, and perhaps that is why they're sensitive.

Questions & Comments

Claudio Fossati added that the point is that for other mammals, the sound level exposure can cause barotrauma (related with physiology apparatus), while in beaked whales the level that triggers the reaction (and causes damage) is a behavioural one instead of a physiological one. That is one of the reasons why he considers difficult to pin down the relation between beaked whales and sound. Also, he referred data of an article soon to be published, where beaked whales have been recently shown to also vocalize at the surface.

Carmen Mifsud suggested that the dive profiles of beaked whales could also account for decompression of nitrogen on the ascent.

Natacha Aguilar explained decompression theory and how the lungs of cetaceans collapse and after that no more nitrogen flux is possible between lungs and tissues. Referring the dive profiles seen in the presentation, she explained that perhaps a step during in the ascent (shown in the graphs) will allow for nitrogen to be released, and after the lungs are not collapsed anymore (as it usually happens in cetacean dives).

Opportunistic Monitoring Training & Tools – Spotter

Virgil Zetterling started the presentation by addressing the potential of mobile phones and tablets has a platform for conservation tools. He spoke about several of the tools Conserve iO has been developing . Then he presented a potential tool to mitigate ship strikes and other threats by ships, and to report sightings of marine animals (specifically whales) directly to a central server, where conditional access to data can be defined at several levels, even depending of data providers specifications. The *Spotter* app is already available for free on the Apple app store, while the *Spotter Pro* is for trained people.

Questions & Comments

Natacha Aguilar asked if the Armed Forces of Malta would consider using the *Spotter* app?

Major James Grixti said that the AFM might be interested in the *Whale Alert* app which is free and accessible, and requested details that were promptly given by **Virgil Zetterlind**. According to the speaker, Conserve iO would be able to include the buffer zones, trawling areas, no take zones, etc. He added the app is able to function while offline, as long as the map has been downloaded previously.

The Moratorium To The Use Of Naval Sonar In The Canary Islands And The Proposal Of Accobams For The Declaration Of Areas Of Special Concern For Beaked Whales In The Mediterranean Sea.

Natacha Aguilar started by addressing the diversity of mass stranding events in e.g. Italy, Greece, Bahamas, Canary Is., etc., where the symptoms detected in stranded animals were similar between events. The speaker mentioned the Spanish fleet use of sonar and submarines, even if it is not so extensive as in other navies, and by saying that little was known about their impact on cetaceans. One of the reasons for this, according to the speaker, is the need for military secrecy: the Spanish navy has retained information regarding British and Spanish joint Navy tests that related to beaked whales mass strandings with them for a year. While the need for military secret is obvious, it makes difficult to establish strong evidence regarding links between sonar and whale deaths. However, the common symptoms detected in animals reinforce contextual evidence (fat and gas embolic syndrome), but a focusing event (stranding) needed to reach the public to be translated into governmental decisions.

In the case of the Canary Islands, NATO vessels were in front of the beaches where the beaked whales stranded locally, which had a large impact on public opinion. The European cetacean society put together a report, the European Union recommended the adoption of a moratorium and restriction measures in the use of active sonar in naval exercises and declared the need to develop alternative technologies.

In practice the moratorium became active since 2004 (date of last mass strandings in the Canary islands, among a total 7 events since 1085 to 2004), even if it was only formalized later in 2007. A 50 n.m. buffer was defined to safeguard whales from tests, covering medium to high density of beaked whales, and there have been no strandings since that date showing that spatial mitigation works.

Natacha Aguilar described the Mediterranean context: it was within this region that mass strandings of beaked whales were documented for the first time in the world. While shallow waters surround Malta, and beaked whales feed in deep waters, there is still evidence for movements of these whales along Maltese waters, together with sperm whales. The deep waters in the south of Malta seem to relate with some sperm whales sightings, and the possibility of having a migratory

corridor in the deeper corridor at the south of Maltese waters is quite interesting. ACCOBAMS acknowledges the need to gather info on this subject, and is developing an effort on progress.

The locations of strandings were mapped, regardless of the motive of death and a 50 n.m. buffer was defined around the locations.

Beaked whales are not common within the waters of Malta but this buffer includes Malta, which is a limitation of the procedure.

A meeting of the ACCOBAMS parties rejected the proposed maps for restriction implementation and so another model still needs to be developed. Nevertheless, it has been stated that the use of naval sonar to be avoided when possible other intense sound sources should be subject to a strong environmental impact assessment. Presently, the scientific community is providing a tool to navies (based on NATO guidelines) to avoid impacts and contribute to conservation.

Conservation Of Turtles And Cetaceans

Carmen Mifsud started by presenting the objectives of LIFE+ MIGRATE: assessing the status in Malta of two populations of protected animals mentioned above, as well as identifying potential sites of importance for these species. Further, she identified all the partners of the project (Malta Environment and Planning Authority, which coordinated the project; Ministry for Sustainable Development, Environment and Climate Change; Kai Marine Services and the Bank of Valletta), having highlighted also that KAI Marine Services were a strategic partner, because of their previous experience in achieving the same goals in other Mediterranean areas, namely SE Spain.

Other points addressed were the budget allocated to the project, co-financed by the LIFE+ funding programme of the European Union, and all the predefined project actions. A special emphasis was given to the communication and project outreach actions, which reached several sectors of Maltese society.

Questions & Comments

Emanuel Bonnici (Civil Protection) suggested MEPA should involve diving clubs more often in these initiatives.

Carmen Mifsud agreed and revealed MEPA is currently striving for that and is presently still contacting more clubs. This ongoing effort extends to fisheries department, associations, clubs, etc.

Discussion on the Natura 2000 Guidelines

Avenues Of Enhanced Collaboration Between The Ministry Of Defence And The Ministry Of Environment

Natacha Aguilar opened the session saying how pleased she was to see so many different faces at the workshop of people who are willing to participate. She

opened the discussion by addressing **Major James Grixti**, from the AFM, about how is the process when turtles (and other animals) are found sick or entangled at sea. He answered that it always depends on the situation, sea condition, etc. Regarding turtle rescue, usually a small boat is deployed, disentangles it, and if it looks healthy it is released on location, otherwise it is delivered to the MEPA.

Natacha Aguilar took the opportunity to ask if KAI would like to suggest any difference in the rescue process.

Ricardo Sagarminaga invited the representative of the AFM to be present at the fisheries workshops, and then advanced to suggest another way the AFM could collaborate in order to defend the well being of turtles and cetaceans. He mentioned that many of the turtles collected here might be entangled or hooked by foreign fishing activities, not necessarily local activities. Ricardo suggested it would be interesting if the AFM could record other variables that might relate the event of a hooked/entangled turtle with the threats. One of the issues that causes a great deal of problems to turtles are driftnets, and therefore the EU has spent a large amount of money in eliminating driftnets from Morocco until 2012. However, Moroccan fishermen apparently passed their nets onto other fishermen (Algerian, Italian, Syrian), and the problem remains. Apparently there are no tools to stop the import of fish from foreign countries which use illegal fishing crafts, and the Maltese Armed Forces could work in order to identify these threats if they're happening under Malta's jurisdiction, playing a critical role in the resolution of this problem.

Major James Grixti revealed the AFM receive several informations e.g. of driftnets being used at beaches, so they are aware and will make the effort to address the problem, even if they have limitations regarding the logistic demands of the task.

Natacha Aguilar asked **Carmen Mifsud** if MEPA keeps track only of sightings, or if dead and injured animals are also in their database. The representative of MEPA detailed that there is national protocol regarding cetacean strandings, stating that protected species stranding are the property of the Director of Environment, and our authority tries to coordinate everything to handle the situation and the data, with the cooperation of the AFM too. There are just a few strandings, which can be quite random, and there hasn't been any significant stranding (except in 1990 when a stranding of a small sperm whale took place).

A recent stranding of a Cuvier's beaked whale was potentially interesting, but MEPA could not retrieve the animal (due to difficulties with cranes, which might have destroyed the corpse and polluted the beaches, forcing the authorities to close the beaches during summer) nor to perform a necropsy (as adequate laboratories were not available). But the protocol was put in place and MEPA representatives know what to do. Data has been gathered in a database and has to be delivered to the proper international/regional entities soon.

Natacha Aguilar considered of utter importance to recover any possible data from stranded cetacean corpses for their ecological and natural history interest.

Addressing a different subject, she asked the Major if the AFM finds many cases of ship that do not comply with the International Convention for the Prevention of Pollution from Ships (MARPOL. **Major James Grixti** acknowledged navy detects (oil) pollution frequently in the Strait of Sicily as it is very busy, but since the AFM does not have the responsibility, the procedure is to transfer that information to the Transport Ministry. We lack the technology to detect oil spots but we record any opportunistic detection, both by air and sea. He also said that there has been a clear evolution (for the better) in water quality around the Maltese islands in the last 5 years.

Carmen Mifsud supported the AFM declarations, and mentioned the POSOW project, presented in the previous sectorial workshop, the day before.

Natacha Aguilar raised the question of what should happen if an oil spill takes place on a drilling platform. **Carmen Mifsud** revealed that the jurisdiction would be from the Continental Shelf Department, part of the Malta Prime Ministers office. Most of the exploration falls outside the jurisdiction of the Environmental department, and even though Environmental Impact Assessments have been performed, most data is confidential.

Natacha Aguilar also addressed the issue of foreign sonar exercises or live fire tests within Maltese marine territory. The representative the Armed Forces of Malta transmitted that, to his knowledge, all exercises are performed out of territorial waters and the AFM does not have any jurisdiction whether they use sonar.

Natacha Aguilar referred to one of the cases of strandings in Almeria, Spain, where the sonar that caused the animals to strand was turned on as a military vessel was passing by. She inquired if the Maltese navy has any control over ships passing through that might have sonar, and the **Major** reinforced the idea that ships beyond the territorial water distance limit have their own jurisdiction and we are not able to acquire any information.

Ricardo Sagarminaga reminded that in an international crisis, areas devoid of any sonar activity would be easy to become a potential focus of terrorist/foe activity.

Carmen Mifsud mentioned the possibility of further collaborations with the Armed Forces to make sure people do not collect other protected species e.g. algae from the genus *Cystoseira*.

Another topic raised by **Carmen Mifsud** regarded explosives, since here are 2-3 explosive areas, where explosives were dumped, and inquired what happens when

the AFM need to detonate something out at sea. **Major James Gixti** admitted never having experienced such situations of detonating explosives, and added that explosives are deposited in appropriate sites.

Natacha Aguilar posed also the question of trawlers crossing those areas, but the representative of the AFM clarified that fishing activities, specifically trawling, have designated areas while explosive areas are identified on charts, without any overlap. Furthermore, Malta does not have any radioactive waste and bombs are diffused before thrown.

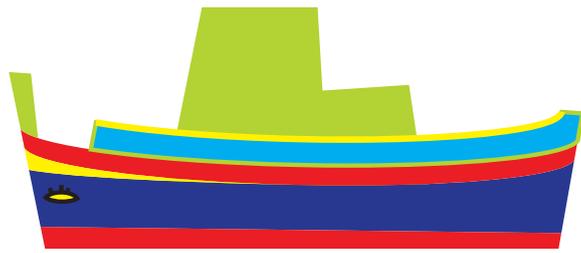
Carmen Mifsud added an interesting fact, that inert dumping areas have been recorded to be colonized by gorgonian corals which usually do not appear in other Maltese areas.

Natacha Aguilar finished her participation with a reminder that communication is a crucial part of the conservation (as in other issues that involve synergies between parts). She thanked the AFM and MEPA for their valuable participation.

Major James Gixti also thanked in the name of the Armed Forces for the opportunity and considered this workshop was very informative, and hoped the present cooperation between part can be maintained.

Ana Tejedor closed the session.





4. SECTORIAL WORKSHOP – FISHERIES

4.1 Official opening and introduction

A video opened the day's workshop under the theme "LIFE+ MIGRATE and fisheries of Malta", consisting of a compilation of footage of artisanal fisheries and the LIFE+ MIGRATE surveys. The video was produced by **KAI Marine Services**.

Ricardo Sagarminaga mentioned the absence of some of the fishermen invited as the weather opened an opportunity for fishing after a long period of bad weather, which forced them to stay away from the sea. Ricardo went on to describe the agenda for the day. He explained the process of involving stakeholders previously started (in individual meetings), something that should culminate in a set of guidelines (that will take into account any contributions from the public, after an approximate 1 month long process of consultation) to which all the maritime sectors hopefully accept and abide to, as owners of the document themselves. Also, he listed the survey methods used throughout the project. The preliminary results seem to confirm the importance of the waters of Malta for both bottlenose dolphin and loggerhead turtle.

Overview Of Fisheries Of The Maltese Islands

Randall Caruana (Director of Fisheries, Dpt. Fisheries and Aquaculture) described the main characteristics of the Maltese fisheries and aquaculture. He also detailed aspects of the fleet and fishing crafts, of which the *luzzu* and *kajjik* are traditional boats which use mostly small longlines, while modern vessels focus on swordfish and tuna as their main targets. The fisheries management zone covers 25 nm off the archipelago, and fisheries restricted areas have been created, while e.g. trawling can only be used in strictly delimited areas. Conservation areas, including Marine Protected Areas, are another type of management tools for the sector. *Posidonia* Seagrass and *Maerl* beds have their own restrictions too.

Service To Fishermen, Stewards Of Natura 2000

Françoise Claro (Groupe Tortues Marins France) started by addressing the rationale and objectives behind the present project: building and reinforcing the bridges between fishermen, scientists and fisheries managers; supporting responsible fishermen to strengthen the competitiveness of regulated fisheries; empower the positive leaders in fishing fleets; integrate fishers in the international sustainability strategies; capacity development of fishermen. Then, the speaker outlined the project actions, including some interesting examples: there is a video available for fishermen using mobile phones that may read the QR code available in the project flyers (at the GTMF website) showing fishermen how to rescue a turtle from nets; the Global Ocean Observing System (GOOS); an exhibition about the fishermen themselves and the fisheries cultures.

Questions & Comments

Ricardo Sagarminaga added that more should be done to preserve the importance of cultural heritage within fisheries, and that Maltese fisheries must have a huge cultural inheritance.

Success Stories Of Fishermen As Stewards Of Natura 2000

Ramón Aguado (CARBOPESCA) presented himself, a fisherman from Carbonera, Cabo de Gata, Spain. He told how he has been collaborating for years with scientist groups (Instituto Español de Oceanografía, Greenpeace, Alnitak, etc.) declaring 100% of their bycatch. He owns a surface longline vessel (from a fleet of around 100 vessels) fishing for tuna from the sea of Alboran to Italy, Malta and Sardinia. He has been involved in environmental struggles since 1987, when he participated in movement against the use of driftnets, which he considers to disrespect the ocean and therefore should not interest any fishermen. He told the audience about the hidden use of driftnets e.g. in France, under a different name. **Ricardo Sagarminaga** added how the European drift nets were passed on to countries like Algeria and Tunisia, and other countries are using them again since Europeans buy fish captured by these nets.

Ramón Aguado declared “ if turtles disappear, fish disappears”. He explained how turtles tend to congregate small fish, which feed larger fish, creating bait balls. He worked together with science to reduce accidental captures and therefore increase the concentration of fish in the ocean.

He spoke of the uninformed reaction against Spanish longliners, who contribute with honest bycatch data, while other fleets do the same sort of captures and bycatch but withhold the same type of information. The changes in longline practices were described (switching bait from squid to fish, lowering the devices a few hundred meters), which allowed to eliminate captures of small swordfish, increased captures of larger swordfish and eliminated accidental captures of any turtles any even other bycatch.

Ramón Aguado also spoke about how all the fleet is being directed to swordfish, even if the bluefin tuna stock has recovered significantly. He added that the traditional fleet and the commercial fleet have opposite approaches and proposed that they should perhaps have different quotas (as artisanal fisheries are more sustainable). While the traditional fishermen (100barcos) land around 900 tonnes, a mere 6 commercial purse-seine vessels can land 1300 tonnes of blue fin tuna. In close collaboration with scientists, following his own interest in preserving his livelihood, he has been using plastic bait for six years with excellent results, preserving the natural stocks of horse mackerel. **Ricardo Sagarminaga** added that this could tackle the problem of predation by rough-toothed dolphin *Steno bredanensis*. **Ramón Aguado** supported that comment, saying that fishermen that use the water between Malta and Libya commonly have that problem with dolphin depredation.

He also addressed the problem of ill-defined biological stops, and exemplified how switching those stops from Oct-Nov to Mar-May could prevent seabirds from being captured accidentally in longlines while feeding their young.

His personal history of collaborating with science and conservation of the environment also include: a symbolic appreciation of his work in turtle conservation by the United States government (which actually took **Ramón** to see the Florida beaches where the turtles he saves go back to lay eggs); the habit of recycling plastic and landing any oil used at sea (waste management).

Ramón finished his contribution to the workshop by talking about a network of ecologist fishermen, which may sound like a paradox, but not from the perspective of fishermen who are the most interested in the conservation of the sea, with its turtles and cetaceans.

KAI Marine Services presented a video about the *lampuki* (*Coryphaena hippurus*) fisheries in Malta.

Aquaculture In Malta - An Overview

Robert Vassallo Agius (Malta Aquaculture Research Centre) described the important sector of Aquaculture in Malta, more important than local fisheries in terms of fish produced, and which should be steered towards sustainability. This reflects the Maltese government national aquaculture strategy towards sustainability (2014-2025). There is potential for growth working with new species, and also in using new offshore areas, and with improved environmental measures. This strategy will try to harness competitiveness through innovation (of products and species).

He also told the history, which started in 1990 with sea bass/ bream production from fingerlings brought from France, Italy and Spain, and detailed the species grown (seabream, seabass, meagre, amberjack, blue fin tuna) and other aspects. An example of diversification is the Amberjack project, which was described.

The market characteristics of blue fin tuna were also shown, obviously referring to the outstanding Japanese demand (4million euros for a 222 kg fish, usually 30-40 euros per kg), which peaked in 2007, but dropped until 2009/10. This was a major factor in the ongoing history of the domestication of the blue fin tuna.

Robert Agius talked about the project managed to induce spawning (by injecting an inducer), to collect eggs (which is immensely laborious and time consuming), to get eggs fertilised (artificially) and to get juveniles surviving in cages (at the time, 2,5year old, c. 21 kg). Recently, Turkish entities delivered 10 000 blue fin fingerlings into the sea, in an industry path that strives for sustainability.

Questions & Comments

Ricardo Sagarminaga commented that the bluefin crisis has pushed a lot of research, like the aquacultural development shown in the presentation. Another

example is how Spanish fishermen use different methods to kill tuna more quickly. This was presented as a good indication of how fishermen search for quality over quantity and that more humane methods are being used.

Sports Fishing In Malta

Pierre Poulton (secretary of the National Federation Of Sport Angling Malta) spoke about the international opportunities for sport anglers and presented the federation. It includes 4 affiliated clubs, which organize sport-fishing competitions on a regular basis. Their main concern is the fact that it is not easy to have local anglers to release back the fish, even with strict guidelines from European federation. The need for education was addressed, improving habits of Maltese sports fishermen, so that the activity can be considered a sport instead of a hobby. A sport takes into account several dimensions around the activity: conservation, education, improving techniques, merging ideas and experiences, while hobbyists do not necessarily respect those principles. The speaker considers Malta has a large potential for this sport, even regarding sports tourism. He mentioned the need for negotiation with local authorities, since a lot of organisations around the world are attracted to Malta just for the sport fishing, meaning it can become an important touristic resource.

Electronic Monitoring Systems To Monitor Bycatch Of Porpoises And New Fishing Technologies To Avoid Seal Depredation In Gillnets

Lotte Kindt-Larsen (University of Aarhus) talked about the implementation CCTV cameras onboard fishing vessels, in return of increased quotas for all the fish landed. The systems consist of cameras installed at the side and are usually paid by fishermen themselves. After starting there was an increase in small fish being landed, representing a more intense use of the resources, but the bycatch of porpoise and seabirds were effectively monitored. The capability of saving entangled animals was also an important factor and was deemed effective. The speaker considered a great benefit to have fishermen participating in return for their data. Another advantage of this method is the ability to get more adjusted conservation measures. A model was built departing from effort data x bycatch, producing a set of high risk (seasonal) maps. This management scheme was presently following 12 smaller boats (gillnets) and around 20 larger vessels. The fragilities of this system were addressed: the fear of “big brother” (which should be perceived instead as a new opportunity for effective fisheries management), the possibility of cheating (which exists). Both are compensated by the fact that fishermen are really changing their mentalities and feeling like they are scientists too, active participants in the management process. Another topic covered by **Lotte Kindt-Larsen** was seal depredation in the Baltic coastal fisheries. This problem led to the development of seal safe cod-pots. The results are still recent, and show that large cods can be caught still, even against the fishermen expectations of the tested gears. This system is not intended just to reduce

depredation but also to increase captures..

Pam, Telemetric Tags & Pingers Management Tools For Natura 2000 Sites

Jeppe Dalgaard Balle (University of Aarhus) spoke about mitigating the interactions with cetaceans, because of depredation in fish farms and fisheries, exploring some technological measures to address bycatch and depredation problems. He explained how in cetaceans sounds are used for several purposes, like echolocation. Since in natural conditions, their own sound at sea surpasses natural background noise, it is important to be careful while introducing sound into the environment as mitigation measure. The speaker has experimented with exposing bow riding cetaceans to several types of sound to get animal reactions. He presented a video that showed habituation under certain circumstances, but in the English Channel some pingers were useful to avoid bycatch of dolphins by trawlers. He also addressed the use of telemetric tags with seals and harbour porpoises, performing behavioural tests at windfarms. He suggested that management of Natura 2000 sites must include permanent monitoring (e.g. passive acoustic monitoring). Nonetheless, there is the need to test if using many marine mammal deterrent devices will have an effect on the wild animals. In the Maltese case specifically, a potential solution to fisheries depredation by bottlenose dolphins needs a prior assessment, and if a system is installed it needs to be monitored.

Ricardo Sagarminaga introduced the following topic. He mentioned the Global Ocean Observing System (GOOS), which requires top level pelagic tracking to be calibrated. Therefore, he referred the need for setting a platform of communication, the topic of the next presentation.

Reporting And Logging Tools For Fishermen Stewards

Virgil Zetterlind presented a range of mobile applications, *Whale Alert*, *Spotter*, etc., which run on Apple™ tablets and iPhone™, targeted because these are the most commonly available computing devices in the world. He showed some examples of the implementations and advantages of these applications. Users can report animal sightings and collect opportunistic data in a live manner. The application are able to redirects users to relevant information towards actions to be made (and restrictions), shows geographic info (tapping the areas will display regulations and restrictions and additional information e.g. how to approach any whale), sends email alerts with sighting data. All data from observers is received in a single server, easily available for data queries. These applications run on a framework that was developed at a global scale although presently its functionalities are still geographically restricted.

Virgil Zetterlind explained that e.g. reporting data regarding *lampuki* fisheries or jellyfish sightings is something programmable in the apps, and that his goal at the

workshop is to add additional info with regards to Malta.

Questions & Comments

Carmen Mifsud commented, regarding the information given in **Ramón Aguado's** presentation, that rough toothed dolphin depredation off Malta is not well known.

Ricardo Sagarminaga explained that Maltese fishermen going outside the 25 n.m. into the Ionian sea off Libya, often have problems of depredation by rough toothed dolphins, which feed on bait from longlines. It's hard to find solutions to deceive such intelligent species.

Carmen Mifsud then inquired about evidence of connectivity with the Atlantic population of loggerhead turtle, as recent genetic studies show that some Maltese turtles are coming from Turkey. Another question was if there is any use for Turtle Excluding Devices (TED).

Ricardo Sagarminaga clarified that there is satellite tag data showing that many turtles are coming in from the Atlantic, plus there is a oceanographic feature in the mouth of the Mediterranean that tends to deflect them from routes towards the West (i.e. out of the Mediterranean). Since turtles are especially concentrated around Malta there is some likelihood that some animals are indeed native from the Atlantic basin.

Regarding the use of excluding devices, **Ricardo** defended that in any case any devices introduced should to be tested first. Excluding devices might work better for sea lions too, for example.

Carmen Mifsud asked about trawling bycatch of porpoises and bottlenose dolphins. **Jeppe Dalgaard Balle** replied that there are several methods but apparently dolphins can enter and leave the trawling net so there is no need for excluding devices.

Ricardo Sagarminaga added that fishermen should come out and point out potential problems with conservation. It might just bring external investment in assessing and solving that problem together with the fisheries sector.

Lotte Kindt-Larsen clarified that in her case study porpoises are not generally entangled in trawling nets, but mainly in gillnets.

4.2 Discussion of the NATURA 2000 Guidelines

Ricardo Sagarminaga approached several risks and issues regarding the guideline proposal and invited the public to actively participate in the making of the document. He proceeded to address the issue of *ghost fishing* by Fish aggregation

Devices (FAD). In traditional Maltese fisheries, these FAD's are usually tied to a weight on the bottom of the sea. As many as 10% of turtles surveyed were entangled in the orange cables used to moor the FAD's, which are left behind by the habit of cutting away just the top of the FAD instead of recovering the whole of the fishing gear once it is used.

Driftnets were also mentioned in the presentations as a large problem in the Mediterranean, prone to become more worrisome as Europe was unable to avoid the consumption and market of fish captured by illegal driftnets.

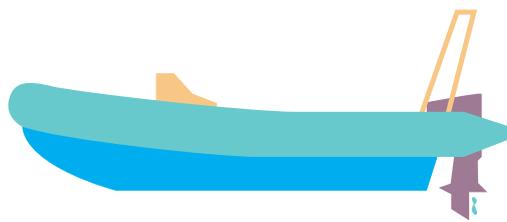
A set of other themes were addressed briefly by **Ricardo** as topics for further discussion: the issue of discards of bluefin tuna (to avoid lower prices of lower quality fishes), the opportunistic feeding of dolphins around the fish farms, the need to report bycatch, noise pollution, debris and toxic pollution and depredation by cetaceans on fisheries were some of the highlights.

Carmen Mifsud the possibility of identifying risk zones for turtle through mapping bycatch from fishermen, and then crossing that information with turtle locations from satellite tracking plus oceanographic data (to get explaining variables). According to **Ricardo**, it implies a permanent need to receive data from satellite tags and to maintain a close relation with the fishermen, in order to ensure the reception of bycatch data. He added that presently longlines have been lowered into deeper waters, however if turtles decide to go deeper for food this might be another problem. He considered that there is still a definitive need for further studies.

Carmen Mifsud asked if it is possible identify the geographical origin of hooks and lines that harm and entangle sea turtles rescued.

Ricardo Sagarminaga turned the question to **Ramón Aguado**, as fishermen are experts on fishing gear. His answer was that perhaps in the past the types of hooks used might have reflected their origin. Nowadays it is difficult to identify from where these hooks / lines are coming from, because of the global market.

Ricardo further explained that in 2005, line cutters were used by the fishermen working with KAI Marine Services. If the problem is just the hook the turtle has over 90% of survival. Nonetheless, he left the warning that the removal of hooks should be tried exclusively by veterinarians, at the risk of the animals' survival.



5. SECTORIAL WORKSHOP – TOURISM

5.1 Official opening and introduction

The Sector Of Tourism In Malta

Mark Pace opened the workshop, presenting the venue for most of the days of the workshop, the Malta National Aquarium, as well as its history in brief terms. He talked about their goals of showing both the historical and the biological aspects of Malta, including the activity of diving. Apart from being a tourist attraction, the Aquarium tries to support the work of local NGO's and involve them in their activities. An example is the initiative to recover sharks from eggs found in the market and delivering them back to sea, together with SharkLab. They also support Nature Trust Malta in activities regarding sweet water fish. This is a differentiation that tourists appreciate and that the Aquarium pursues, as well as developing all sorts of educational activities inside the Aquarium, trying to include their activities in the national school curriculum.

Questions & Comments

Ana Tejedor commented that one of the shortcomings of scientists is that usually scientific results do not go “very far” in the community, and that aquaria own a marvelous window to show the importance of the marine realm. She asked how many visits the MNA gets per year, and **Mark Pace** answered 150-180 000 visits besides schools (school visits daily 100-200 students /visit).

Emanuel Bonnici (Civil Protection) asked if the Aquarium makes educational chapters available on their on your website.

Mark Pace said that teachers can ask for a password and download all the educational units we give in our educational activities and also have a previous study plan for their day here.

Ana Tejedor inquired if the MNA would you be open to receive Natura 2000 materials for their *curricula*, and the MNA representative confirmed that it “would be a pleasure”.

Plastic Pollution

Sylvia Frey (Oceancare) talked about the nature of marine debris, of which 4/5 is plastic, and 80% of it land-based plastic debris brought by wind, rivers and water disposal facilities. She revealed that the production rates of plastic have increased in the last few decades and that 1/3 of all plastic production per year ends up in the environment. Most is wasted even though it is non renewable, but there is

still a huge potential for plastic recycling. **Sylvia Frey** warned that estimates of plastic in the ocean are colossal and that the Mediterranean Sea alone may have 800 million plastic items. And because it is meant to be durable, which is also a big problem: through entanglement and ingestion by marine animals (1 million dead seabirds /year), as a source of toxic chemicals, as a vector for persistent contaminants (more dangerous if plastic enters food chains), and even as a vector for invasive species (rafting possibilities have doubles with marine debris). The economic costs are also relevant, as UNEP causes damages in the amount of 13 billion USD/year. A study in Sweden calculates an income loss 1-5% because of marine litter. But how to counteract it? **Sylvia Frey** showed a video about plastic debris which is shown in flights of a Swiss airline. One of the highlights was that single use plastic has to be phased out in the near future because e.g. plastic bags comprise 1/3 of all plastic items in the ocean and, out of 1 trillion plastic bags produced per year, less than 30% is actually reused. The speaker also referred some preventive measures: selling plastic bag at a symbolic value (0,15€) induced a 80% reduction in use in a study, introducing a plastic bag tax or even a plastic bag ban are also alternatives. **Sylvia Frey** presented some present initiatives: the new EU plastic directive, a market base initiative consisting of a responsible snack bar certification in Spain, the mitigation/awareness project AWARE Foundation: “Dive Against Debris” running since 2011, the Waste Free Oceans Foundation (working since 2011), beach cleanings and even some projects compensating fishermen to go fishing for debris. Another topic covered was the problem of microplastic particles, inferior to 5 mm, which are added deliberately in cosmetic products (toothpaste, etc). There are an estimated 250 billion microparticles in the Mediterranean, which raises a huge concern regarding the ingestion of microplastics by microplankton, putting at risk the marine food chains which help support life on earth. However, there are a few preventive measures regarding microplastics taking place: the U.S.A. microbead free water act, and other countries are also banning microbeads in products. This presentation left the audience with the following keywords: REDUCE - REMOVE - RECYCLE.

Questions & Comments

Ana Tejedor commented on the great potential for tourism activities in the field of education awareness, using the theme of the previous presentation to develop activities with tourists, for instance.

Emanuel Bonnici asked if microplastics could cause cancer. The speaker answered that it is likely since these plastic particles can end up in our food, but it is a very complex subject, which requires a lot of research.

Emanuel Bonnici suggested as preventive measures against plastic pollution the reuse of plastic bags, and remuneration for returning plastic bottles. He also adverted to the problem of plastic fumes in land-based fire.

Ana Tejedor stated that, if the dimension of the problem is that relevant, a change in the public is not sufficient, there should be demand for a change coming from the authorities.

Carmen Mifsud congratulated **Sylvia** for her work and for the wonderful video, which is very useful to share with younger audiences/children. Regarding the presentation, where the speaker showed how to calculate a very simple estimate of microplastic quantities from a single transect, Carmen suggested that the methodology could be shared with MEPA for future monitoring of marine microplastics in Malta. Carmen also informed that until some years ago, Malta used only glass bottles, but the market had to be opened to plastic, unfortunately. Legislation once stated that only recyclable plastics could be used, but it was altered after a few years. Presently, another preventive measure was implemented: plastic bags are sold instead of being offered. Nevertheless, some shops went around the system. Regarding turtle plastic ingestion, figures also include nylon lines from fisheries. The veterinary services only detected one situation where plastic excluding nylon lines was ingested by the turtles.

Sylvia Frey clarified that estimates that refer to marine animals in general are very rough, so nylon lines were included. Furthermore, besides ingestion, entanglement in plastic is also a problem. Regarding plastic bottles, **Sylvia** also suggested that, since tap water in Malta is not drinkable, maybe one preventive measure could be to improve tap water quality for it to be an alternative to PET bottles. In Switzerland, the recycling rate of PET bottles is 90%, which is another measure to reduce use of plastics. As for bags, a ban is not to be excluded from the horizon of possibilities and a set of measures maybe used simultaneously.

Carmen Mifsud asked regarding cosmetics, how can the public know which products are plasticbead free. **Sylvia Frey** mentioned the UNEP initiative “Beat the microbead” which is an app for consumers to recognize products with microbeads (from the barcode, so Malta would have to change its own barcode system to identify these products).

Cetaceans And Sea Turtles In Maltese Waters

Ricardo Sagarminaga spoke about the opportunities from cetaceans and turtles to the tourism sector. These are related to public awareness, because of the fascinating lives of these animals. **Ricardo** described the habits of the species that can be seen around Malta, and highlighted the bottlenose dolphins. This species feeds mainly on demersal fish but has a very strong culture of taking advantage of fishing gear (unfortunately, this might be a ground for conflicts), but there isn't a very high density of animals in Maltese waters. On the other hand, large groups have been confirming the importance of the area. The speaker considered it is very interesting when tourism takes cetaceans as emblematic/flagship species, raising public awareness. Whale watching might not have a

very large potential for tourism in Malta, with the use of specific legislation to avoid problems, there might be potential in seeing some bottlenose dolphins which are often attracted to the fish farms. Using the case of the Canary Is. as an example, it was possible to see how whale watching laws have changed, facing an already profitable but unregulated industry, and in the end it worked fine and whale watching companies are active and beneficial stakeholders, quickly responding to problems like pollution that may affect their activities. Regarding the case of sea turtles, loggerhead being the commonest of several species, these present a possible resource for the tourism sector, allowing for an increase in public awareness, since they use mostly coastal waters. Most loggerhead turtles in the Atlantic-Mediterranean area come from Florida, USA, and some can even get to the Maltese waters. The effects of conservation have taken decades to show, but a recovery of this species has been seen. **Ricardo Sagarminaga** also enumerated several threats that might arise from unregulated or mismanaged practices. Because of this, training sessions are important for the tourism sector. Nonetheless, the Tourism sector has a huge potential, as long it is kept sustainable as long as the responsible authorities understand the importance of regulation being defined prior to the implementation of the touristic exploitation of resources, such as dolphin or turtle watching.

Yachting, Diving And Nature Tours And Biodiversity

Godwin Zammit (Royal Malta Yacht Club) expressed the club greatest enthusiasm towards the environment. He went on to describe the significant growth of the yachting industry. The demand rose from 150 berths in 1990, to around 1500 berths in 2013. Therefore, he conveyed the notion that a more rational strategy might be to recover existing ports instead of changing the coastal areas any further. Most boats are local and sailing instead of motorboats, which is positive since sailing is environmentally friendly. The representative of the RMYC also noted the special relationship between sailors and dolphins, demonstrating the potential of preserving these creatures to promote public awareness towards environmental issues. There was a description of the Yacht Club's activities, which concern the organization of racing activities, but not only. In these events, the club requests reports of cetacean sightings and videos of any encounters with these creatures, inclusively giving prizes to the best sightings. The speaker spoke of one of their most important events, the Rolex Middle sea race, which is a economically significant event to Malta, where racers have the time to gather sighting reports and closed his presentation with a very interesting promotional video about that event.

Questions & Comments

Carmen Mifsud thanked the support of the Yacht Club to the activities of the 4th of July. There are already collaborations - racers already report sightings but

MEPA would like to ask report for the LIFE+ MIGRATE to return the favour by offering some deliverables. **Godwin Zammit** said the RMYC is always available to receive that kind of activities, and conveyed the appreciation of their members to receive a lecture, for example. **Carmen Mifsud** suggested that it would be interesting to give the training session of cetacean and turtle identification.

5.2 Presentation on the Natura 2000 Guidelines

Tourism as a risk or as a potential

Anna Gureva (Gaia Foundation) came in representation of an environmental nonprofit organization that manages coastal areas part of Natura 2000 in Malta and Gozo. These sites include beaches (blue flag certificates), where Gaia does nature conservation, by propagating native Maltese plants and removing exotic plants, by stopping erosion using native plants. Their activities also include public awareness campaigns (beach cleaning, boat trips and children activities) and the management of a tree nursery (which is also used for environmental education actions with schools). These sites have board signs available but **Anna Gureva** was not sure if cetaceans or turtles are included in the information regarding the sites. It was acknowledged that marine information could be interesting to become available at the beach sites. In regards to beach management, it was asked if there are any potential threats to cetaceans or turtles, and the answer was positive: speedboats present a risk to these species.

Bruno Claro (KAI Marine Services) asked if there was any expectation on the part of the Gaia foundation to become part of marine conservation, and the answer was that for the time being, the interest was limited to the projects at hand.

Jacqueline, a Maltese volunteer in the LIFE+ MIGRATE, talked about her expectations that environmental education would start at a young age, with children, so that the population will be able to realize in time that the sea and the environment need more attention and caring, towards a sustainable future.

Ricardo Sagarminaga asked **Jacqueline** what was her perception of the Maltese attitudes regarding these issues. She answered that the population of Malta is very little informed. She considered that it would be very good if more information (like some of the videos shown at these workshops, e.g. the Ocean Care foundation video about plastic pollution) could be made available to the public during the evening news, at schools etc. The volunteer talked about her own initiative to buy natural cleaning products using recycled containers (available locally at a special shop), or to produce her own products. She hopes more people might become aware of the importance of these issues.

Ricardo Sagarminaga asked: what is the view of the Maltese on the tourism industries?; Are there any people interested in nature?; Why do visitors come to Malta?

Emanuel Bonnici (Civil Protection) clarified that most people come for the historical sites, and many come for diving.

Ricardo Sagarminaga inquired how would the audience approach the tourists right now, as they do not know anything about the environmental issues of Malta nor its natural riches?

Emanuel Bonnici stated that most people around do not care about pollution or biodiversity. He considered the intervention of the media is fundamental to change perceptions. Several examples of misbehaviours were given (e.g. dockyards/shipyards are very polluted in Malta) as well as examples of corrective behaviours in a Maltese context e.g. buying a reverse osmosis machine to retrieve water from the sea and reusing PET bottles; using a solar energy system.

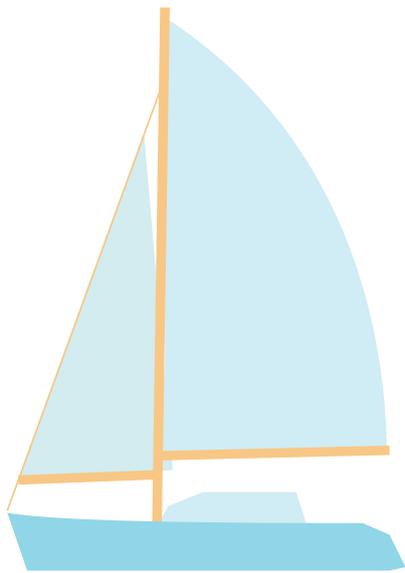
João Tavares (GOBIUS Communication and Science) talked about the importance of continued environmental education and the need to educate also touristic service providers to demand better tourists, while providing a higher standard of services, along with environmental information that use the natural patrimony to add value to the country.

Bruno Claro added, concerning the potential of dolphinwatching in Malta, that there is a wrong notion that any dolphinwatch trip operation needs a 100% success rate. His own study in Portugal showed that tourists get a high degree of satisfaction with just a proper trip to the marine environment, even if dolphins do not appear, and are also willing to pay an extra fee (up to 5euros) for conservation projects.

Carmen Mifsud gave some other information regarding the tourist profile in Malta. Tourists come to Malta because of student trips and English courses (especially in the summer, and also older people). Divers come for cleaner and warmer waters and cheaper courses, either for historical or natural dives. Very few tourists come here for nature (although there is a category of usually German tourists, mostly interested in orchids). Additionally, Malta receives older British people that come to rest or even retire. Only a few NGO's do nature walks. Tourist travel to Malta was further characterized in terms of transportation: many come in cruises (perhaps with some potential to receive video awareness campaigns, while others come flying, using low cost airlines (potential to target air Malta with videos or advertising on the monthly magazine, plus posters and banners in the arrivals area). Others come sailing. Malta depends totally on tourism so maybe taxing the touristic sector (even if for nature conservancy) might challenge the country's competitiveness.

Ricardo Sagarminaga thinks that the use of the natural patrimony of Malta would strengthen the touristic sector. Dolphinwatching is “sexy”, from the point of view of the tourists, he said.

Anna Gureva gave her portrait of how sensitive Maltese are towards the environment. According to her perceptions, most people does not care about the environment. Nonetheless, she believes that the e.g. the garbage problem is made worse by the inability of local management to create opportunities for garbage disposal. Also according to the participant, providing info at airports might not be effective enough, as many studies have shown. **Anna** suggested that the English courses texts could be written to transmit knowledge regarding the environment and the natural richness of Malta.



6. SECTORIAL WORKSHOP – RESEARCH, EDUCATION AND CONSERVATION

6.1 Official opening and introduction

Ana Tejedor presented the objectives of this workshop, and the speakers from the opening session of the day. Thanks were given to Nature Trust Malta for allowing the use of their premises at Marsaxlokk.

Action A3: Survey

Ricardo Sagarminaga presented the stakeholder involvement strategy, and the global goal: to achieve a coherent and efficient Natura 2000 management focusing on International EU and Regional coherent networking. To gain expertise and obtain an Active Stakeholder involvement again, the scientific community was urged to get together with fishermen, Maritime transport, energy, defence and tourism representatives and other sectors of society which may be stakeholders in the areas to be protected. Regarding the specific goals of LIFE+ MIGRATE, a premise is that studying cetaceans and turtles requires long term monitoring, and Malta fortunately has long term monitoring of turtles and cetaceans by Adrianna Vella and great oceanographic data from Aldo Drago, both from the Malta University. **Ricardo** then described the work effort through figures and summarized the methods utilized. His opening presentation addressed the guidelines design process, which will involve public participation to get to a comprehensive set of guidelines that safeguard the biodiversity of the area in a sustainable way.

Luke Young (Ministry for Sustainable Development, Environment and Climate Change) thanked all the speakers, some of which travelled a long distance to attend the workshops, which shows their expertise, commitment to conservation and enthusiasm, and also thanked the participants in general. **Luke Young** also stated that, on a personal level, it has been interesting, and a enriching experience, getting to know more about the richness of the Maltese marine wildlife. He considers LIFE+ MIGRATE to be both important and necessary, posing challenges and questions, not only to the environment but also to the Maltese nation as a whole.

Carmen Mifsud (MEPA) thanked Nature Trust which has been the venue to this day's sessions, and then went on to lay out the original motivations behind LIFE+ MIGRATE, why bottlenose dolphins and loggerhead turtles were chosen, being migratory, and also why was KAI chosen to develop this project, with the final goal in mind to select Natura 2000 sites within Maltese waters. The representative of MEPA readdressed the communication and public awareness actions developed throughout the project since October 2012.

The targets of these actions are the whole society, but some more specific training sessions were addressed to e.g. the armed forces, namely the maritime squadron and the air force. **Carmen Mifsud** gave a brief overview of what KAI has been up to and what MEPA has been doing in terms of training and raising awareness.

The Sector Of Research In Malta

Benjamin Metzger (Birdlife Malta) presented the topic of research in Malta, giving a comprehensive overview of study subjects and entities. Obviously the University of Malta plays an important role in research, investigating in fields as biology, oceanography or marine archaeology. There are governmental bodies which develop research activities in the fields of fisheries and agriculture, while museums are run by Heritage Malta, the national agency for museums, conservation practice and cultural heritage. Other components of society, less formal, also play a roll in research, contributing through projects like the citizen science initiative “Spot The Jellyfish”. Non Governmental Organizations are very important in applied conservation projects. Some examples of NGO’s are Nature Trust Malta, Sharklab and Birdlife Malta. These organizations cover a wide range of research topics, but act mainly in conservation, environmental monitoring and also restoring actions.

As a case study, **Benjamin Metzger** talked about Seabird Research in Malta. He outlined the history of the area, starting in an old Gozitan fisherman saying about how Scopoli’s shearwaters arrive around St. Matthias day. From then on, mainly descriptive research was led by an extensive list of naturalists. Today, ornithological research is widely non funded and non professional, MOS, the Maltese Ornithological Society started monitoring storm petrels breeding on the islet of Fifla, needing to ask the military if they would be test bombing the islet before they moved there. The speaker outlined the importance of understanding the threats before any conservation work and mentioned some threats like predation, light pollution, bycatch in fisheries (gillnets and longlines), collisions with wind farms and marine litter. Nowadays, mark-recapture at colonies allows to model population sizes of seabirds, and a single Scopoli’s shearwater was aged 28+ years old using rings. The ongoing projects involve similar work to what KAI Marine Services is doing for LIFE+ MIGRATE, deploying marine surveys within 25 n.m. from Malta, radio telemetry studies with storm petrels, GPS tracking (using GPS loggers) of shearwaters. They have managed to create interesting density maps that help select Natura 2000 sites in Mediterranean waters. Benjamin ended his presentation by praising the valuable contribution of LIFE funding, that together with some strong partnerships and the help of volunteers, helps safeguard the future of Maltese seabirds.

Environmental Education In Malta

Mark Mifsud (University of Malta) spoke about how environmental education (EE) can be wrongly implemented. The attitude of raising awareness (by itself) is outdated. Malta harbours a set of peculiarities that grant it a long list of problems and environmental needs: one of the highest population densities in the world, for instances, which creates severe problems. Presently, the concept of environmental education turned into education for sustainable development (ESD), which depends on the beneficial effects to the economy, the environment, culture and society. “Education, public awareness and training” is the main priority. The failure of environmental education translates into the fact that most of us have a heavy environmental footprint disregarding our knowledge; knowing about the environment is not the most important, but to have a sustainable behaviour and set of principles is.

Mark Mifsud gave some of his explanations to why is ESD so slow in Malta: an extremely competitive education system that rewards examination drilling instead of behavioural changes; no sense of belonging, presumably derived from a colonial mentality, which also distances citizens from their own reality (since they study other countries in Maltese curricula); the short term measure of government seems to be ineffective to implement long term programmes and measures of conservation. Mark proceeded to detail a study profiling Maltese students’ environmental perceptions and knowledge. The study detailed their attitudes towards the environment, correlations between variables and qualitative data analysis, factors that influence their attitudes. Some of the summarized results are mentioned here. These students showed more knowledge of global issues than of local issues. The most important sources of environmental info are ranked in the following way: school, TV, internet, books, family, magazines. Nonetheless, ranking for most reliable sources is different, and TV is deemed less reliable. Another example of the results is that only 20% separate waste.

Projects On Research, Education And Conservation In Malta

Alan Deidum (University of Malta, NGO Council member) presented himself and IOI (International Ocean Institute), the NGO he represents. He spoke about several of EU projects developed (by IOI and UoM), tapping several EU funding instruments, and detailed some of them.

BioDivalue is a vessel tracker available for the public for the Maltese islands, measuring the impacts of marine traffic on the marine environment; Perseus is a Marine strategy directive framework providing training opportunity and internships; Panacea strives to promote the marine biodiversity, assisting in Marine Protected Areas (MPA’s); CapeMalta is a jellyfish dispersal model; CIESM is a monitoring initiative, measuring variation in water column temperatures; Spot the Jellyfish is a citizen science project and has identified 5-6 new jelly species; MED-JELLYRISK addresses an integrated coastal management approach into 10 Marine Coastal Zones (MCZs) in the Western and Central Mediterranean sea

basin to face with increased jellyfish proliferations and has developed an online application; etc. The speaker also detailed some actions regarding ocean literacy and advocacy, which is a main goal within the Horizon 2020 funding tools, training and education (masters in ocean governance and oceanography).

Conservation Of Sharks Around Maltese Islands

Greg Nowell (Sharklab) started his presentation asking “what do you think when you hear the word shark?” “Usually not good things”, he said. The truth is that sharks are generally misunderstood by the public. They have also declined 90% within the Mediterranean because of: people being afraid of shark and because of fisheries (longlining, bycatch in other fisheries, finning). It was explained why we need to push conservation efforts for sharks in Malta. An example is that short fin mako is still landed in fish markets. A fish market study shows some alarming sign in some species, even if it reveals some stability in others, because of habitat preferences that do not allow for fishing. All sharks sold are eaten, but sometimes sharks are disposed of (going to waste). SharkLab has been working in fish market data gathering, market monitoring, DNA sampling and also sampling for other studies. The volunteers take the opportunity at the market to gather other info about these animals, making anatomical studies possible. Certain status changes allowed changes to the national enforcement of fisheries limitations, but management plans are still to be implemented. The NGO suggested minimum landing sizes.

The speaker explained general aspects of shark reproduction, and showed how egg cases can be recovered at the fish market, This allow hatching the sharks in artificial conditions, in order to release them back to sea. Eleven have been saved in this manner in total (supported by the Malta National Aquarium). A very interesting initiative for the general public is “Adopt a shark”, which has the goal to help the egg hatching and keep sharks in conversations of regular people. They also lead an observational study of sharks in Fifla.

Greg Nowell described several aspects of their activities, awareness campaigns, collaboration with other NGO's. Before finishing, the speaker instructed how people can help the NGO and participate. Finally, the audience was shown an impressive amount of partners.

The importance of Natura 2000 in Research Education and Conservation

Benjamin Metzhert showed the Natura 2000 sites on a map and represent a significant part of the small archipelago of Malta and, obviously, research is fundamental for selecting these sites. Natura 2000 are the least disturbed sites in Malta, representing biodiversity hotspots and are meant to allow for connectivity (as migratory corridor, flyways, etc).

A case study was presented, regarding the stopover ecology of birds on the islands of Comino and Malta. The speaker approached the educational potential of these

sites: 90% of schools were taken there, in order to raise future conservationists. In Malta, Natura 2000 are still fenced places, but the situation regarding illegal hunters is slowly improving. It was highlighted that these sites are the only places with forests and some endemic plant communities. The possibility of implementing management is also of importance

The presentation ended focusing on future tasks at hand, namely on the issue that the next areas to be designated should be offshore seabird hotspots, and on the heavy work still to be done to tackle the challenge of safeguarding migratory birds coming through Malta.

Visual Survey: Materials And Methods

Bruno Claro spoke about the visual surveys executed by KAI Marine Services. He started by conveying some of the difficulties of surveying the marine environment, which has some of the disadvantages both of the aerial and the terrestrial environments. He characterized the study area and the timeframe of the study. We proceeded to detail the methods used. These comprehended linear transects optimizing visual effort and logistics, performed in a zigzag pattern. He defined a sighting, and the variables recorded for which sighting, then explained in general terms the spatial analysis. The outcome was a descriptive analysis of cetaceans and turtles in Maltese waters, quantitative and qualitative data regarding human impact, baseline information and a standardized protocol ready for use in the future.

Acoustic Surveys: Material And Methods

Ricardo Sagarminaga presented how the KAI team set up a monitoring plan for the main indicators, and prepared optimized protocols (that allow for small resources) to determine trends. **Ricardo** described the methodologies used: materials, the study area and sampling strategies, which were developed simultaneously with the visual survey effort. Regarding materials, perhaps as many as 90% of the research groups use the same set up (software and types of materials e.g. acoustic arrays, *Soundtrap*) so it ensures comparability. Dolphins can be detected up to 200 nm in most circumstances but spermwhales can be detected at 8 nm. He addressed the problem of underwater noise, which must be one of the main changing factors in the world of cetaceans in the last century. **Ricardo** announced that collaborations are on the way for other research teams to use our data in Malta.

Natura 2000 and Conservation Focusing on Malta

Cristopher Cousin (MEPA) talked about the characteristics of Natura 2000, pointing out that most such sites in Malta are also used for human activities. He

defined the characteristics that got these sites classified, and addressed their status. Spatially speaking, the sites are scattered all over the islands, but one site covers all the western coastal area of the island of Malta. In fact there is an asymmetry regarding the amount of terrestrial and maritime sites, but LIFE+ MIGRATE is a contribute to achieve a balance. **Cristopher Cousin** also showed some relevant statistics, regulations (the Habitats and Bird Directives, plus some Legal Notices that transpose European laws). He specified the present situation in Malta regarding the Natura 2000 network, describing the process, which follows these steps: identification of areas, defining pSCI-SCI-SAC sites, defining conservation measures, Implementing actions, monitoring and reporting.

He addressed the *Posidonia* survey initiative and the resulting Natura 2000 sites. Showed the more important marine habitats protected under the Habitats directive (*Posidonia* meadows, sandbanks, submerged and partially submerged caves) as well the main protected species from the marine environment.

Cristopher Cousin enumerated the benefits of having these sites: Allowing zonation, enhanced monitoring, implementing actions, raising public awareness, and optimizing the assessment of the conservation status of habitats and species. He highlighted the fact that conservation always requires appropriate assessment, along with conservation objectives, measures and actions. Further work for the future includes the identification of new marine sites offshore and inshore, and to establish effective management of existing sites through data collection, planning and carrying out management plans and defining new appropriate regulation.

Ana Tejedor complimented Natura 2000 as a dated but nonetheless flexible tool that continues to ensure the conservation of sites and species.

Risks to Marine Turtles in maltese waters - a view from Nature Trust's Wildlife

Karen Goode (Nature Trust Malta) from the Rescue Team - Marine Pollution, described her experience related to what is being found of the frontline of turtle rescue, in a very visually rich presentation, with lots of pictures. Land debris is going into the ocean, and that is obvious in Malta. Nylon bags are just an example of debris acting as trap for turtles, and the presentation showed several examples of turtles swallowing plastic and metal debris, turtles found entangled in discarded fish nets and even covered in oil. Even when being rescued by citizens, the inadequate transportation of turtles can also be detrimental to the animal. One of the more complicated hazards are fishing hooks and lines, which turtles swallow or even become embedded in such materials, several dying from this condition. Collisions with powerboats and propeller strikes is something that is apparently increasing, and some turtles have even been harpooned. Awareness must be raised in users of pleasure boats and jetskis, encouraging them to call for rescue. A beach monitoring scheme is needed in order to cover eventual nesting attempts. Finally, **Karen Goode** addressed the Nature Trust's mission to rehabilitate and educate.

Conservation Issues: New conservation challenges

Vincent Attard (Nature Trust Malta) reported how in the 70s and 80s there was no idea of conservation in Malta, but there was still some abundance of wildlife, and he remembered getting loggerhead and green turtles too. The changes that took place in the meanwhile justify the need for conservation. Specific campaigns have to be planned: in the past an NGO paid for turtles needing rescue so they could be released, creating a market for turtles and worsening the problem. After years of campaigning, NTM has witnessed a big change, and nowadays fishermen actually bring in turtles and report sightings. An interesting perspective given was that the density of turtles found in Maltese waters, according to **Vincent Attard**, could also be explained by the proximity of the coast of Libya, which offers with 240 km of sandy coasts. There is still the need to educate the fishermen who try to retrieve and rescue turtles from their gear to cut any fishing line as short as possible to avoid the death of turtles, not to pull the lines or to transport the turtle. Another threat that NTM has identified is driftnets, which are becoming a cause for concern, being dangerous even to sperm whales. Furthermore, the risks of maritime transport and leisure boating collisions are also serious. Present research includes Mediterranean scale studies to map the impact of human activities which might pose threats to conservation. Oil pollution is also an increasing problem, so a proper action plan must be in place. Certain diseases are being studied, using necropsies on turtles with unknown causes of death, and exchanging information with other Mediterranean turtle rescue centres. Not only plastic is a problematic sort of debris, so even metal bolts are being found inside turtles. Climate change is another concern. The speaker added a recent information from Greece, because of the rising temperature, the sex ratio of nestlings is changing (more females) which raises serious concerns. As for the tools one can use to help turtle conservation, satellite tracking and more info on turtle movements would be useful. The NGO would like to track the released turtles but economic constraints have not allowed for it until then. But not all is bad. Even fishermen are interested in marine protected areas in the present time. The speaker conveyed the NTM ambition to know more about the reasons why turtles need rescue, to be able to mitigate the ulterior harming factors. Education for Sustainable Development is crucial, so education must be behind simple actions like beach cleanings. He pointed out that, in the specific case of underwater cleanups, the divers need to be made aware that organisms might use some of the debris, for example. Therefore, some planning regarding this issue is needed in advance. **Vincent Attard** talked about the process of cleaning the turtles (all the epiphytic taxa are also being studied, which is useful to determine the provenience of some turtles). Light pollution should also be addressed, to help turtles that might be trying to nest in Malta. Important data were given on this subject: in 2010 and 2011 there were reports that some baby turtles were seen, something that suggests breeding attempts. There was a nest found on a beach with some disturbance, having MEPA relocated the nest to a safer site. The speaker went on highlighting some issues regarding conservation,

considering law enforcement must be increased, and exemplified with a new trend of unregulated dolphin and turtle watching.

Although much has changed in the last years regarding public awareness, there is still much to be achieved, especially with children, some of which come to visit the rescued turtles on a regular basis. Since some campaigns from the past have been very productive, there is hope that projects will continue to improve data networking, because the more data is available the more conservation will move forward in years to come.

6.2 Presentation on the Natura 2000 Guidelines

Ricardo Sagarminaga opened the discussion session by giving a brief overview of turtle conservation in the Maltese waters. He approached some issues raised earlier, highlighted networking as a factor allowing science to move extremely fast in the last few years. He pointed out the example of SE Spain longlining fleet (which were considered by some as the worlds' worst fisheries) which are some of the few which provide bycatch data from their fisheries, and management needs good, scientifically sound data. He explained how some easy measures made a big difference to reduce turtle bycatch in the Spanish swordfish longliners. Tests involved switching baits from squid to fish, hook shape, depth and seasonal effects, and all the results were explained to the fishermen, who tended to respect the way science experimented, as their own experience involves some degree of experimenting. They have come to realize the oasis effects of turtles, attracting bait for larger fish which they exploit, so they can actually profit from having turtles around.

Ricardo Sagarminaga considered that the procedure of hook extraction is an important aspect of saving turtles. In this regard, KAI distributed and showed how to use linecutters to fishermen, helping them save numerous animals with very simple technology. He proceeded to make a parallel with Maltese problems referred in the previous presentation. Regarding ship strike he advised basking behaviour experiments to be carried out. **Ricardo** also highlighted that there are several details which might demand a change in mitigation measures (like hook shapes affect different size classes), making a point of the need to base conservation in sound scientific finds..

Ricardo Sagarminaga presented a preliminary document (working draft) awaiting for contributions by the public. He explained the structure of this document and of the sectorial guidelines booklets in preparation too.

Mrs. Louise Tanti inquired what should happen with the data that external contributors pass on to the guidelines team and **Ricardo** clarified that, if it is a comment, then it will go in to the document in straightforward manner, if its a question the team will get back to the contributor with an answer, then the team will clean up he document and deliver it to MEPA. Obviously the team welcomes suggestions even on references.

Louise Tanti also asked if contributors will we be able to see the general comments on the document, and the answer was negative, in order to avoid chaotic interaction between contributors. MEPA will have access to all the comments though.

Ricardo Sagarminaga closed the session thanking Nature Trust Project Partners and all the participants.

ANNEX I - SPEAKERS

(in order of appearance)

● *Carmen Mifsud (MEPA)*

Carmen Mifsud is a Senior Environment Protection officer within the Malta Environment Planning Authority. She has been working on marine issues for more than 14 years. She works on a number of Multilateral Environment Agreements amongst which the Protocol Concerning Specially Protected Areas and Biodiversity within the framework of the Barcelona Convention, the Convention on Migratory Species (Bonn Convention), Bern Convention and others. She is also the National Focal point of ACCOBAMS (the Agreement for the Conservation of Cetaceans in the Mediterranean, Black sea, Atlantic and contiguous areas) and a member of the Marine Turtle Specialist Group of the International Union for the Conservation of Nature (IUCN).

● *Luke Young (Ministry for Sustainable Development, Environment and Climate Change)*

Representative of the Ministry for Sustainable Development, Environment and Climate Change.

● *Stephanie Agius (Bank of Valletta)*

Ms. Stephanie Agius is responsible for Media and Community Relations at the Bank of Valletta.

● *Ana Tejedor (KAI Marine Services)*

Ana Tejedor is a founder partner and the Project Management Director of KAI Marine Services. Although specialized in marine management and international negotiation, as sailor and marine expedition coordinator, Ana approaches the world of policy with the perspective

of those who are out at sea. As a Senior Advisor of the Ministry of Agriculture, Food and Environment of the Spanish Government she has provided support for the monitoring and implementation of the international norms for the protection of the marine environment in Spain since 2005. The main tasks include developing public policies for the conservation of marine biodiversity and representing the Spanish delegation at the main forums on conservation and sustainable use of the marine environment (marine groups of the General Assembly of the United Nations, Convention on Biological Diversity, OSPAR Convention, Barcelona Convention, Migratory Species Convention, Environmental Protection Committee of the International Maritime Organization, European Commission Working Groups).

● *Mark Pace (Malta National Aquarium)*

Mr. Mark Pace is the sales and marketing director of the Malta National Aquarium.

● *Purificació Canals (MEDPAN)*

President of the Network Of Marine Protected Area Managers In The Mediterranean (MEDPAN).

● *Ricardo Sagarminaga van Buiten (KAI Marine Services)*

Co-founder of associations as ALNITAK and the Spanish Cetacean Society, Ricardo Sagarminaga van Buiten has been involved in sea turtle and marine mammal research and conservation since 1982. Passionate about classic navigation, maritime culture and research on great pelagic species and the open ocean ecosystems, Sagarminaga has specialised in the building of bridges between science, public policy and the

“users” of the sea. With regards to the sector of maritime transport, Ricardo is a firm defender of a pragmatic approach to the assessment, management and monitoring of potentials risk to biodiversity, built on a robust scientific foundation.

● *Adriana Vella (University of Malta)*

Dr. Adriana Vella, Ph.D (Cambridge) is a conservation biologist well known for her scientific and passionate interest in wildlife and nature. She has dedicated many years to research on marine species in particular. Among the most well known projects is her dolphin and whale research which is known locally as abroad as having been a pioneering project for this central-southern part of the Mediterranean. Scientists and Journalists have come over to Malta to interview and share with her local work and the Maltese Islands have been placed on the Map for Cetacean Research due to her dedicated year round work. She has also developed other interesting marine projects on blue fin tuna, sharks and rays, dusky groupers, turtles, etc. Sustainable development and fisheries, ecotourism, conservation area requirements and conservation of habitats are also of great interest to her.

● *Victor Gutierrez (Fundación Biodiversidad)*

Coordinates European projects for the Biodiversidad Foundation, especially LIFE + and platforms for information and public participation in environmental matters. He is also responsible for the economic justifications for projects calls for aid. Environmentalist with experience in environmental and wildlife training centers, joined the Foundation in 2003 in the Department of Projects. Bachelor of Environmental Science from the Autonomous University of Madrid, he specialized in ecology at the Friedrich Schiller de Jena University (Germany).

● *Célia le Ravallec (ACCOBAMS)*

Dr. Célia le Ravallec is a project assistant for the Agreement on the Conservation of Cetaceans in the Black Sea Mediterranean Sea and Contiguous Atlantic Area Permanent Secretariat.

● *Françoise Claro (Groupe Tortues Marins France, GTMF)*

Dr. Françoise Claro is the coordinator of the Marine Turtles Group of the Natural History Museum of France.

● *Miguel Palomares (former Director IMO)*

Miguel Palomares is the former Director of the Marine Environment Division of the International Maritime organization.

● *Vincent Attard (Executive President, Nature Trust of Malta)*

Mr. Vincent Attard is the Executive President of Nature Trust (Malta). He has been active in Nature Trust (Malta) since 1972 first as a volunteer and later as full time since 2006. He is qualified in Business Management and Administration. He worked in the Central Bank of Malta as an Executive before he took over the position of Executive President of NTM. In the 1980s he carried our research on Marine turtles in the Greek Islands. In 2013 he attended a training course with Cedre, in France, on oil pollution and de oiling wildlife through REMPEC. He is now training local volunteers in combatting oil pollution.

● *Aldo Drago (University of Malta)*

Dr. Aldo Drago is the Director of the IOI-Malta Operational Centre and Head of the Physical Oceanography Unit at the University of Malta. He obtained his Ph.D. in physical oceanography from the University of Southampton, SOC

in 1999. His initial engagement was with the Malta Council for Science and Technology in 1991, where he conducted a number of programmes and initiatives both locally and internationally, and served as the Coordinator of the Marine Sciences Network. He is currently the Maltese delegate to the Intergovernmental Oceanographic Commission (IOC/UNESCO) and to the International Commission for the Scientific Exploration of the Mediterranean (CIESM), the National Representative for the Committee on the International Oceanographic Data and Information Exchange (IODE/IOC), and Malta's lead delegate on the European Earth Monitoring Programme (GMES) User Forum. Prof. Drago is also the National Delegate for Malta on the Joint WMO/IOC Technical Commission for Oceanography & Marine Technology (JCOMM). Since 1998, he is serving as the Executive Secretary of MedGOOS (the Global Ocean Observing System for the Mediterranean) with Office in Malta.

● *Natacha Aguilar de Soto (University of La Laguna, Spain)*

Dr. Natacha Aguilar is the director of the cetacean research line within BIOECOMAC (Grupo Investigación en Biodiversidad, Ecología Marina y Conservación) of La Laguna University, Canary Islands. Dr. Aguilar has directed and participated in several studies related with noise disturbance in cetaceans, as well as acoustic ecology and diving behaviour of Pilot Whales and Beaked Whales. At the moment she has an EU Marie Curie Fellowship and combines research in Auckland University and in the Canary Islands.

● *Gabino González (REMPEC)*

Mr. Gabino Gonzalez, who joined REMPEC in June 2006, holds a Master Degree in Material Engineering from

the European School of Materials Science and Engineering, Nancy. After two years as IMO consultant for the RAC/REMPEITC-Caribe in Curassau, where he was implementing the Centre's technical Co-operation programme on spill preparedness and response for the Wider Caribbean Countries, he joined the Operations Department of Oil Spill Response Limited (OSRL) and East Asia Response Limited (EARL) Alliance, before taking the role of coordinator of the IMO/IPIECA Global Initiative project for the Western and Central Africa (WACAF) region.

As Programme Officer (OPRC) in REMPEC, his responsibilities include *inter alia* development of national and subregional systems for preparedness and response to accidental marine pollution, providing advice to the coastal States in cases of emergency, planning and organizing training activities, drafting and editing Centre's documents, as well as advising the Director on the policy issues regarding activities in the field of oil pollution prevention, preparedness, response and co-operation.

Claudio Fossati (CIBRA, University of Pavia, Italy)

Dr. Claudio Fossati graduated in Natural Science, Univ. of Pavia, IT in 1997, started to work with CIBRA on underwater Bioacoustics in 1994. He holds a Ph.D. in animal behaviour (Parma Univ., IT) with a thesis on acoustic behavior on striped dolphins. Consultant to Columbia Univ., NY, USA, for implementation of NMFS Mitigation Policies during seismic research cruises (PAM hardware and mitigation procedures/guidelines development). He is a consultant to NATO CMRE for development and implementation of Acoustic Risk Mitigation Policies. Co-writer of Guidelines for ACCOBAMS and IT Govern.

● *Virgil Zetterling (EarthNC, Inc. and Conserve IO)*

Virgil Zetterling is the co-Founder and Chief Technology Officer for EarthNC, Inc and Conserve.IO. He leads EarthNC's effort in the development of complex iOS, Android, and Google Earth visualizations, geospatial displays, spatial data processing, and mapping for a wide range of customers including the Spotter Pro and Whale Alert projects. In addition to his industry leading expertise in geospatial data processing and GIS visualization design, Virgil also has a strong background in video and LADAR processing for remote sensing applications. His work credits also include high-profile Google Earth design projects for Google and the National Geographic Society. Virgil holds a Master's Degree in Electrical Engineering from the United States Air Force Institute of Technology.

● *Jérôme Couvat (Souffleurs d'Ecume)*

Jérôme Couvat has a Master in Marine Mammal Science from the University of St Andrews (2011). I have been working for the French NGO Souffleurs d'Ecume for 2.5 years, developing and implementing management measures to reduce the risk of ship strikes in the north-western Mediterranean Sea.

● *Major James Grixti (Armed Forces of Malta)*

Major James Grixti is the Second-in-Command Maritime Squadron of the Armed Forces of Malta.

● *Randall Caruana (Director of Fisheries)*

Director of Fisheries, Dpt. Fisheries and Aquaculture of the Government of Malta.

● *Ramón Aguado (CARBOPESCA)*

Spanish longline fisherman.

● *Robert Vassallo Agius (Malta Aquaculture Research Centre)*

Dr. Robert Vassallo Agius is Head of the Malta Aquaculture Research Centre, within the Department of Fisheries and Aquaculture. He graduated BSc from the University of Malta before pursuing his studies in Japan where he got his MSc and PhD from Tokyo University of Fisheries. He has a lot of experience in breeding marine fish species for aquaculture purposes, and focuses mainly on the amberjack *Seriola dumerili* and bluefin tuna *Thunnus thynnus* research and development.

● *Pierre Poulton (Kingfisher Sport Fishing Association)*

Mr. Pierre Poulton is a sport fisherman representing the Kingfisher Sport Fishing Association.

● *Lotte Kindt-Larsen (University of Aarhus)*

Research Assistant, DTU AQUA (National Institute of Aquatic Resources), Section for Ecosystem-based Marine Management.

● *Jeppe Dalgaard Balle (University of Aarhus)*

Research Assistant, Department of Bioscience - Marine Mammal Research (University of Aarhus).

● *Sylvia Frey (OceanCare)*

Dr. Sylvia Frey is a conservation biologist from Switzerland. She holds a masters degree in environmental sciences and a Ph.D. in neurobiology from the University of Basel. Sylvia has been working for the marine conservation association OceanCare for 16 years. She acts as a project leader and director for science and education. She has been involved in various cetacean research and conservation

projects, in particular in the Mediterranean Sea. Besides her dedication to the conservation of whales and dolphins, she has been engaged in a sea turtle research and protection project. As a conservation biologist she is in particular interested in using scientific knowledge as a sound basis in order to better protect marine species and their habitat.

● *Godwin Zammit (Royal Malta Yacht Club)*

Commodore of the Royal Malta Yacht Club.

● *Benjamin Metzger (Birdlife Malta)*

Dr. Benjamin Metzger started volunteering in bird research and nature conservation in his early youth. Later, he studied classical zoology, marine biology and ecology in Heidelberg and Rostock. He completed his PhD on immuno-competence and parasite-host interactions in migratory songbirds at the Institute of Avian Research 'Vogelwarte Helgoland' in 2011. Since 2000, he has been working on various Environmental Impact Assessment's in marine environments and collected extensive experience in surveying seabirds in colonies on land, from research vessels and via aerial surveys. During the past 10 years, Benjamin has been taking part in bird migration studies and research projects on bird associated emerging infectious diseases in many European countries, Africa and Central East Asia. At the moment Ben's main project is the EU Life+ Malta Seabird Project.

● *Mark Mifsud (University of Malta)*

Mark is a Chartered Biologist, a Chartered Environmental Scientist, a Chartered Science Teacher and a Certified Wildlife Photographer with a wide range of experience in Environmental Education, Environmental Science and Sustainable Development. He has reviewed EIAs and advised on ODZ applications within MEPA

for eight years. Mark has more than twenty years international teaching experience, and is currently the Co-coordinator of the Masters in Education for Sustainable Development at the University of Malta. His current research interests are ESD and pro-environmental behaviour modelling.

● *Alan Deidun (University of Malta)*

Dr. Alan Deidun is a Senior Lecturer within the Physical Oceanography Unit at the University of Malta. He has published several papers on different aspects of coastal and marine ecology and is recognised as a Chartered Biologist by the Society of Biology of London. He is currently involved in several areas of marine biology and oceanography research and is Project Manager at the University of Malta on a number of EU-funded projects. Dr. Deidun is also deeply involved in environmental advocacy, having penned a newspaper column for the past 13 years, which has received for three times the local Environmental Journalism Award. He is currently Council member of the local environmental NGO Din l-Art Helwa.

● *Greg Nowell (Sharklab)*

Founder of Sharklab-Malta, a non-profit Voluntary organisation focussed on research, raising awareness and making a difference for Elasmobranchs (sharks, skates and rays) around Malta and the Mediterranean, as well as promoting a sustainable and respectful approach to the marine environment.

● *Christopher Cousin (Malta Environment and Planning Authority)*

Environment Protection Officer within MEPA.

● *Karen Goode (Nature Trust Malta)*

Wildlife Rescue Team Coordinator.

