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SEA-MED PROJECT TECHNICAL SERIES



ORGANIZATION AND DEVELOPMENT OF SUSTAINABLE NAUTICAL TOURISM IN LASTOVO ISLANDS NATURE PARK, CROATIA

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ORGANIZATION AND DEVELOPMENT OF SUSTAINABLE NAUTICAL TOURISM IN LASTOVO ISLANDS NATURE PARK, CROATIA

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2. Font Gelabert (2016), Setting up of the boats monitoring system in Nature Park Lastovo Islands, Croatia, Sunce & WWF Adria” was developed within the framework of the Sea-MED project: Sustainable Economic Activities in Mediterranean Marine Protected Areas (2013-2017).

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SUMMARY

This document resumes the studies carried in 2012 and 2015 to evaluate and provide guidance on the organization of nautical tourism in the Nature Park Lastovo Islands.

The studies wanted to be a basis for a proposal of the establishment of mooring systems and for the planning of measures for future reduction of nautical tourism impact on marine environment, primarily seabed communities.

The size and characteristics of the Park, the importance of including the wishes and complexity of the social reality of a small community, as well as legal procedures require a detailed analysis to plan for a sustainable nautical tourism.

By obtaining detailed information through participatory approach and further processing, we deliver a preliminary assessment with proposals detailing where and how many buoys should be installed according to the observed actual demand of the nautical sector.

We also propose to undertake a demand management strategy to accommodate the available space and resources to the public demands. Finally, we propose a set of actions for reaching sustainable tourism in the Nature Park Lastovo Islands.

Nature Park Lastovo Islands was established in 2006, it is the youngest nature park and one of least developed Croatian protected areas with a limited budget and capacity. Association Sunce participated in the establishment of the Park and, for a number of years, has been working with public institutions to support them through capacity building, promotion, scientific research, and coordinating and facilitating the development of the management plan. Partnership and technical support are essential for the implementation of proper management that will enable economic development along with nature protection.

With the WWF MedPAN South project that was run in Croatia¹ by the Association Sunce in collaboration with WWF Mediterranean, funds and technical support have been secured to achieve the above-mentioned results.

Coordination of these studies development was led by the Association Sunce in close collaboration with the Public Institution Nature Park Lastovo Islands and the Ministry of Environmental and Nature Protection, relevant local and national stakeholders were also involved. The study includes technical, environmental and socio-economic parameters, the experience of other parks in the country and abroad, and provides organizational and technical solutions.

In accordance with the results of this study, setting up of the mooring buoys system and electronic ticketing system are planned for Lastovo Island Nature Park. Electronic ticketing system might be used to improve the monitoring system of boats and it could enable the establishment of the community of users, who support Lastovo Island Nature Park. In that sense, the study represents the baseline document for future planning of nautical tourism and monitoring studies.

INTRODUCTION: NAUTICAL TOURISM IN MPAS – ISSUES AND IMPACTS



Nautical leisure is a steady-growing human activity that provides many jobs to those serving the demand and also a great return to the people that want to live a sea experience. More and more, the increased offer of chartered boats with or without skipper makes easier the living of a dream that resides in the imagination of many urban inhabitants: dropping stress, sailing coastal waters, living in the sea for some weeks enjoying friends and nature, ecstatic sunrises and sunsets, full moon nights, starred sky in remote coves, good life eating and drinking local products.

The deployment of the necessary tools to serve this rewarding activity has an important impact in terms of habitats destruction and also materials and energy consumption during the building, operation and disposal of both boats and infrastructures for the operation of these boats. From a holistic point of view, the impacts of nautical tourism in the environment need to be analyzed from the cradle to the grave of a boat. We talk shortly about these general aspects and we focus the document in the impacts of the operation of the marine activities in Marine Protected Areas (MPAs)

NAUTICAL TOURISM IMPACTS FROM CRADLE TO GRAVE

We come from a time where boats were made of wood and iron; they had long potential life and near-to-zero waste at the end of their life. They have been replaced by cheaper plastic boats made with non recyclable materials that have less maintenance costs but significant problems of production of toxic waste products during the construction and also at the end of their lifetime. The building of newer, fancier boats to fulfil the comfort expectations of a high purchasing power segment of our society results in the premature dropping of used boats that are potentially able to serve for some decades more, just to produce new attractive and fashionable boats. Nothing new under the sun of the general model of the production of goods.

The building of new marinas to offer more bases in places closer to attractive destinations or to ‘create new poles of economical activity’ is destroying many of the protected coves in our coastlines all over the Mediterranean. Small and weather protected coves with pristine waters are becoming more and more scarce and they have a high ecological value as nursery places for many species with biological cycles not always unshrunk. Once “developed”,

the biological function of a cove or bay is deeply changed or lost forever.

Saving the coastline from the continuous push of the market driven construction of new marinas can only be solved with clear protection policies, changes in the models of ownership of both moorings and boats² and, when necessary, the deployment of economic tools like environmental taxes oriented to reducing the demand and/or fund the operation of the country MPA network. (Many boats are in their moorings more than 95% of the year, so initiatives of boat renting and boat sharing are becoming more and more popular). This allows the optimisation of the use of the scarce good 'mooring' and the expensive capital good 'boat'.

IMPACTS ON MPAS

MPAs are a great pole of attraction for sailors. In these protected corners of the coast sailors can find many of the following elements: untouched landscape, clean waters, spectacular sea beds, plentiful marine fauna, protected underwater ecosystems, spectacular and usually unique diving spots.

The daily operation of a boat full of human beings is also not neutral for the environment. Some of them, the most relevant, are enumerated.

The vast majority of sailors get rid properly of the trash they produce on board (empty cans, bottles, cardboard, organic matter etc.). A growing number of them is also becoming aware of the need of proper selective disposal of waste in the facilities of their homeports instead of leaving them in remote paradisiac destinations like small islands, where dealing properly with waste is extremely expensive. Modern motorboats and yachts have onboard comfort installations including kitchen, toilet, shower, generator, air conditioning, desalination unit. All of them produce emissions/noises/waste waters. All of them can be kept within legal limits if the boat is equipped with the proper devices and the skipper and crew observe the rules.

One of the key impacts of nautical tourism on marine ecosystems is produced by anchoring. The anchor and chain a boat launches in a bay can damage the bottom living structures. Fragile seaweed communities like *Posidonia oceanica* meadows are severely damaged by anchors.

As a result of the wish of staying a few hours in many different places to enjoy them, or resulting of the need of moving due to weather conditions, the basic manoeuvres of sailing -> arriving to a nice place -> anchoring -> sailing again to a new destination -> anchoring again can be repeated several times a day by each boat present in the MPA, and the impact of the anchoring can be more or less relevant for the benthic communities depending on the size of the boat, and where, how and how long the anchoring takes place.

Anchoring only on sand, reducing the amount of chain released, avoiding to pull the chain with the boat reverse to 'dig' the anchor without being sure the anchor is on sand are ways to reduce the impact of anchoring, but the definitive way to minimize this impact is using moorings deployed to protect the site.

Even if the described individual impacts are kept within the legally binding limits, the accumulation of little emissions+spills+pollution+impacts in the seabed made by many boats along many days can in the long run produce a chronic degradation of the sailing or anchoring area.

In a MPA, these impacts clearly attack their core function -marine environment protection and improvement- and so, have to be carefully prevented in order to not jeopardize the future evolution of the site.

To protect a place, the radical approach of no sailing + no anchoring is the one that provides the best results but at the same time it is a perfect recipe for failure. Restrictions to sailing and / or anchoring needs to be well reasoned and based in solid conservation science. Specific zones can be closed temporarily or permanently but a consistent conservation objective must be backing each timing and zoning restriction.

The conservation objectives and the rationale behind the measures taken by the MPA management needs to be consistent to be understood by the sailing community. A continuous process of explaining the problems and eventual successes in the management of the MPA needs to be in place.

1 Data acquisition -> 2 Management decisions -> 3 Monitoring of Results -> 4 Communication with the stakeholders and users -> go to 2

In remote protected areas, the communication of decisions use to be simpler, needing to address only to the sailing community. In areas with human activity, like the Lastovo Natural Park where a small community is heavily dependent on tourism in summer, communication and consensus with the local stakeholders is mandatory to launch a sustainable strategy of impacts control understood and accepted by all the actors.

Whatever measure tending to reduce or conditionate the flow of boats -and thus potential clients to the tourism oriented local small businesses- taken without consensus is likely to see its way to implementation full of obstacles.

STUDY AREA: LASTOVO ISLANDS NATIONAL PARK

Lastovo Islands Nature Park is the second largest marine protected area in Croatia, with surface of 196 km² (143 km² sea, 53 km² land). Indented coast, numerous islands and reefs and clear sea make it attractive for sailors, especially those looking for tranquillity, peace and detachment from the bustling nautical destinations.

Sailors fall into group of visitors with greater purchasing power and bring a significant portion of revenues to the local community of Lastovo, primarily through catering facilities. Sailors also co-finance the work of Public Institution Nature Park Lastovo Islands through the ticket system.

Unfortunately, this type of tourism has a major impact on the environment, namely damaging the *Posidonia oceanica* meadows with anchors, waste water, spreading of invasive species, floating waste, biocides, bilge water and noise. Significant damage to the *Posidonia* meadows due to anchoring has been recorded especially in Skrivena Luka, Zaklopatica, Makarac and Pasadur.

The need for urgent action has been shown by a scientific assessment of the state of meadows conducted in 2011 and 2012. In 2010, another study conducted by the Institute of Tourism about the perception of sailors in the Park³ showed that main downside for sailors are noise and waste, as well as the crowds in attractive bays. This indicates

that the saturation of boats at certain locations and seasons has been reached and better management of anchorage, collection services, and distribution of vessels in the bays should be considered.

The necessity to reduce the negative impact of sailors on marine resources and increase the safety of visitors was identified in the Spatial Plan of the Lastovo Municipality and the Regulation on Internal Order of the Nature Park Lastovo Islands. Listed necessary actions include: improving organization of visiting, waste collection, planning restrictions on anchoring and mooring with permanent mooring buoys for boaters and divers.

Management Plan of the Lastovo Islands Nature Park, which was developed in 2010-2012 within the MedPAN South Project, includes a first priority specific objective to decrease the degradation of *Posidonia oceanica* meadows on locations under the nautical pressure compared to the state in 2011 and the distribution of anchoring and buoys setting is one of priority measures indicated therein.

All stakeholders, especially local residents have recognized nautical tourism as having a great potential for island's development and as one of the biggest threats to the environment, while setting buoys for mooring has been proposed as priority measure on several occasions.



STEPS FOR SETTING UP A MOORING SYSTEM

IDENTIFICATION OF ACTORS INVOLVED AND LEGAL FRAMEWORK

Croatia is a well-known destination for nautical tourism, identified by the State Government as a strong sector with good perspectives for growth. To properly develop an economic sector, three main actors are to be taken into account: administration, industry and consumers. In the case of the implementation of mooring fields as alternative to free anchoring, as a part of the nautical tourism activity, the ‘industry’ are the concessionaries of the administrative permits to install and operate them, and the ‘consumers’ are the users of the moorings.

Administration

In 2009 a 10-year Nautical Tourism Development Strategy of the Republic of Croatia 2009-2019 was elaborated.⁴

The document identifies a series of Strategic Goals, the first of them being related to the environmental sustainability of the activity:

1. Sustainable resource use and management
 - a) Area and environment (capacity, protected areas - natural, cultural...)
 - b) Nautical infrastructure (nautical ports, shipyards, ports open to public traffic)
 - c) Nautical tourism services (hiring vessels – yachts and boats – charter, organisation of circular tours and one-day excursions, vessel maintenance and repair in nautical ports and shipyards, vessel management, nautical tourist supply, nautical tourist information service, training participants in nautical tourism and other services for the purpose of nautical tourism)
2. Reviewing spatial planning documents aiming at the realisation of moderate construction scenario of new reception capacities.
3. Increasing reception capacities through rehabilitation, reconstruction and renewal of existing ports (historical ports in urban environment, abandoned military ports, upgrading nautical ports for the purpose of accommodating large yachts)
4. Setting up surveillance and management maritime navigation system
5. Equipping vessels and nautical ports with devices and equipment for the protection of marine waters from pollution and supervision of those vessels and ports
6. Setting up integral management for nautical tourism system (computerisation through database

and maritime domain register)

7. Administrative procedure simplification and legislation harmonisation
8. Increasing vessel production for nautical tourism in Croatian shipyards – development of nautical tourism clusters
9. Stimulating upgrading of the existing and the construction of new repair and service centres
10. Strengthening competitiveness of all nautical tourism participants
11. Emerging technology and environmental standard use
12. Setting up continuous education system for participants in nautical tourism

This document states the importance of finding a compromise between nature conservation and economic development:

*“The basic principle of management of the development of nautical tourism is the principle of sustainable development which presumes the **necessity of finding a compromise between the need for preservation of natural areas and the need for economic development**, and it is achieved primarily by establishing the carrying capacity of an area and establishing a ceiling of growth of new capacities for reception for a certain period.”*

It also warns about the need to avoid UUU (Uncontrolled, Unrestricted and Undirected) development:

“In the future, the greatest threat to long-term sustainable development of nautical tourism can be its further uncontrolled or unrestricted and undirected development, especially if it is pressured by a significantly greater demand for than supply of new moorings in the Mediterranean.”

This is without doubt an important reference document, but it does not go into the details of what the threats to the environment are or what are the endangered natural assets to protect. In fact there are provisions to be made in the development of new marinas or harbour moorings, but there is no warning about the details of the impacts of the daily activity of the existing fleet (or the increased fleet that will result from the application of the action plan). The words *Posidonia oceanica*, seabed or the concept of ‘moorings to protect the seabed from the impact of anchoring’ are completely missing from the Strategy.

This fact is interesting, because Croatia has been, and is, pioneering the implementation of the mooring concessions and has wide experience in

this field. However, no specific guidance in that respect exists in the mentioned strategic document. If we are supposing that the authors wanted to include such initiatives, they would have to be included in chapter 4 (Development Vision and Mission and Strategic Goals; 4.1 Strategic goals; 1c *sustainable resource use and management – nautical tourism services*).

Concessionaries

Concessions for the setup of moorings in bays for day and/or overnight anchoring are a business that can generate revenues in summertime to local entrepreneurs in the coastal area. This is especially attractive for communities based in remote locations, where business opportunities are limited. According to existing spatial plans, it is possible to apply to the tendering processes called by the county authorities, and operate the concessions for a number of years.

The concessionaries pay to the administration a yearly fee for the concessions and a percentage of the income generated and have to make the installation and maintenance according to agreed technical prescriptions.

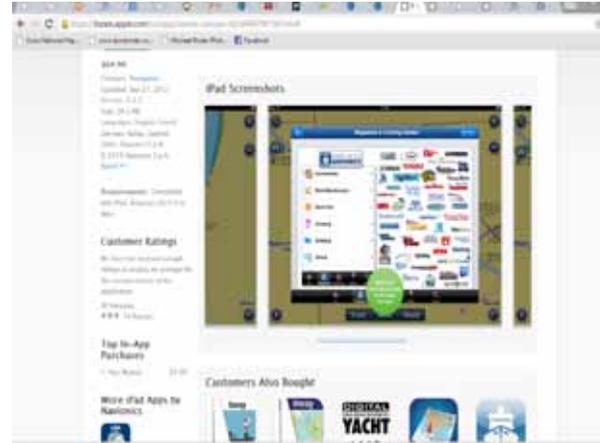
The Ministry of Maritime Affairs, Transport and Infrastructure in general considers that public institutions such as Lastovo Island should not deal with economic usage of maritime domain. It is their opinion that public institutions should not conduct economic activities, but activities for which they were established in the first place – nature protection. So, there should be a public tender and the public institution should be able to prescribe conditions (such as types of boats, size of buoys, technology used, etc.) through giving approvals to spatial planning documents and location permits.

Users

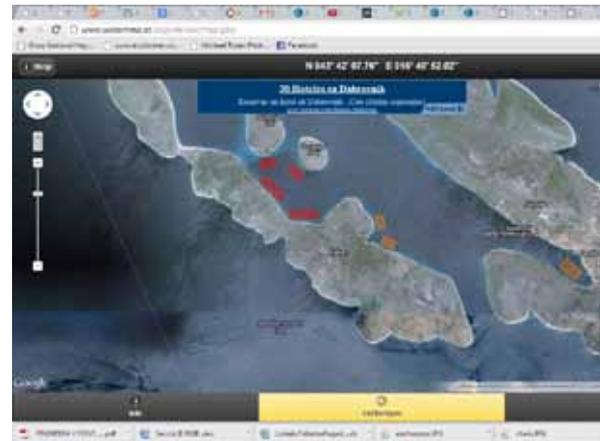
Users of the moorings are passive subjects in the whole process. Upon the arrival at a site where there is a concession, they can choose between using one of the buoys paying the established fee, anchoring at a minimal distance of 300 m from the concession limits⁵, or look for some pier from locals or a *konoba* (tavern). A 24 h stay is granted, and usually they are asked to leave the mooring the next day by noon. Many moorings include additional services, such as waste collection service, a number of free and/or paid transfers to land or other supply facilities. As far as we know, there is no concessionaire that has setup a reservation system that you can use to be sure to have a free buoy for your boat at your arrival. There is no bidirectional communication users-concessionaires, but some sailors communicate and share the prices, quality of services and satisfaction via the social networks.

As examples we can point to:

The Navionics community: The Navionics hardware seller has developed a low cost mapping and sailing tool that incorporates the possibility that the users setup points of information in their maps while sailing. These information items can be shared via web with all the members of the App. This applies to mooring fields, but also to restaurants, gas stations.



The website <http://anchorageincroatia.blogspot.com> is maintained by an individual sailor who is also a programmer since 2011. He provides regular information and news about the moorings, in some cases more accurate than administration does, because he and the readers of the blog continuously update the site database.



Regulatory framework

Granting concession to a concessionaire can be done in accordance with the environmental and nature protection legislation. Concession at the maritime domain can be given only after the border of the maritime domain has been determined and put through land register.

The concession fee is distributed in the following way:

- 1/3 goes into the State Budget
- 1/3 goes into the County (Regional) Budget
- 1/3 goes into the Town or Municipality Budget (local self-government)

Economic usage of maritime domain is maritime domain usage for conducting economic activities. Concession for economic usage of maritime domain is granted based on the public tendering process. Construction of buildings on maritime domain for the needs of different services that are not undertaken for profit is considered a special usage of maritime domain. Concession for special usage of maritime domain is given based on the request. In national park and special reserve, only the Croatian Government can grant a concession for economic usage of maritime domain and in other protected areas the responsible body (County Assembly or Croatian Government) can grant a concession with prior approval of the Ministry of Environmental and Nature Protection. The Croatian Government can take a decision to grant a special usage of maritime domain to a legal person that manages national park, strict or special reserve.

A yearly concession fee for economic usage of maritime domain has permanent and variable part and its size is determined based on the feasibility or profitability of economic usage of maritime domain. A yearly fee for a concession that is granted for special usage of maritime domain is determined as a symbolic fee.

The concession can be transferred completely or partially to sub-concession in a same extent and under the same conditions under which it was granted, with an approval of the concession provider.

PARTICIPATORY PROCESS⁶

In order to get a proper feedback from local stakeholders, 31 interviews were conducted with different persons, some of them local entrepreneurs that provide different services related to nautical tourism, others related to land tourism hosting. Interview was focused on entrepreneurs directly or indirectly related to tourism on the island and representatives of relevant local and national authorities. Some of them were providing their personal position, while others were talking as representatives of groups at different levels (major,

fishermen association representative, tourist office representative). 31 interviewees represent more than the 6% of the winter population census of the island.

A list of relevant people to be interviewed was prepared by Association Sunce and Nature Park Lastovo Islands, and the interviews were conducted in the second half of July 2012.

Questionnaire description

About one third of the people are working or involved in activities that can be classified under two or more 'flags'. This is normal under the local circumstances of low population and many fields of opportunity that, if combined, can provide a sufficient level of income under a strategy of operation that will not work in a scenario of wider scale and bigger concurrence.

TOTAL INTERVIEWS	31	
land tourism	12	38.7%
apartment renters	9	29.0%
hotel manager / staff	2	6.5%
camping manager	1	3.2%
nautical tourism	13	41.9%
<i>konoba</i> with mooring	5	16.1%
marina business	3	9.7%
diving centres	2	6.5%
local fishing	3	9.7%
other	17	54.8%
restaurants	6	19.4%
café bars	2	6.5%
authorities	7	22.6%
other services	2	6.5%
TOTAL 'FLAGS'	42	

To keep a register of the interviews and to make sure that the relevant questions for the study were dealt with, a semi-structured questionnaire was prepared. The dynamics of the interview was open, allowing going into details not initially present in the questionnaire. Original proposals and opinions were registered and included in the final report.

The interview structure was divided in different sets of questions, generating dialogue about different subjects:

- Expectations, to try to get the position of the interviewed about benefits from nautical tourism, including some questions to identify to what extent there is a common vision about benefits of nautical tourism and to try to collect some ideas on how to improve it.

- Talking about control of environmental damage, to see if the fact that ‘anchors destroy Posidonia’ is known and shared by all stakeholders.
- The Park’s initiative to deploy buoys to protect the seabed, the associated decision-making process and discussions around facts leading to that decision-making.
- Possibilities of creation of new jobs around nautical tourism for local people. Trying to shortlist the kind of jobs that can be potentially created by this project.
- Discussing the way the entrance fee is collected, the convenience of maintaining it, and its eventual effect in future figures of visitors.
- Setting the price for the mooring service and/or the entrance fees.
- How the funds obtained from the entrance or services provided to visitors are used.
- How local stakeholders can be active in decisions associated with the deployment of buoys.

Synthesis of perceptions and most significant results

The findings of the interview are described in detail in 15 pages of the 2012 study. We summarize here the main results.

Benefits of nautical tourism

Only one person claimed that the nautical tourism is NOT providing wide benefits to Lastovo population. The remaining 30 gave a general ‘yes’, and some detailed responses are listed below. What is relevant is the repeated assertion that the nautical tourism season is much longer than the apartments touristic season, which is worse due to rising ferry prices. The obvious ones are related to the coastal services (authorities, konobas (taverns), marinas, motorcycle rental). It is also very common to produce local agricultural crops and products in the low season to be sold in summer. “Prijatelj Lastova” (traditional island products brand) is successfully sold to visitors.

Inland restaurants can receive clients from touristic charters if they make agreements with the companies and/or crewed yachts.

In 2008 Sojourn Tax Act changed. Sojourn tax for nautical tourists is not charged by the Tourist Board any more. Instead, the vignette system has been introduced and it generates revenues at the state level (special bank account of the Croatian Tourist Board), which is then redistributed. Lastovo gets part of this based on registered mooring places. Recent installation of 40 new moorings in Skrivena Luka increased this contribution, which is divided between the County or Local Tourist Board (40%), Park (10%) and Croatian Tourist Board (50%).

One of the diving centres states that 40% of the clients are people visiting Lastovo in boats.

Trends in number and typology of boats

The responses to this question show how subjective the perception of a measurable fact can be. While information from the harbourmaster’s office (they hold the only objective information about evolution of number and kind of boats arriving in Ubli as a entrance port to Croatia until now?) show a trend of growing numbers and growing sizes of the boats, there are two groups that have opposite opinions.

Only a few people did not answer the question on the trends in number and typology of boats. The opinion of 14 people was that the number of boats was growing, and 11 people said that it was declining.

The opinion of two thirds of the people related to the nautical sector is that there is a decline in the last several years, and inversely two thirds of the people not directly related to the nautical sector think that there is an increase in the last several years!

This divergence could be due to the subjective nature of people’s responses ‘creating opinion’ as strategic behaviour. That fact reveals the need for the Park to have objective information via its own registering/monitoring process.

Other people showed concern because there are more sailors with very limited experience, putting themselves at risk. In particular, given that anchoring is not easy and can be tricky with bad weather, they suggest that the deploying of moorings can be a good solution to neutralize problems generated by poor anchoring skills.

Ideas to speed up the success of nautical tourism

An open question to gather opinions on that subject was answered by all the interviewed. A total of 47 suggestions were given by 31 people.

Strengths for the development of nautical tourism

This question was left open to up to 3 suggestions from the interviewed people.

28 people contributed to the diagnostics with 59 statements (some people pointed to only one concept, others to two or three). We grouped them in 3 categories and weighed more the first concept than the next one and so on. More than 50% of the weighed opinions were nature related. The interviewed see as more relevant the natural values and specific natural reality of the archipelago for sailors than the strictly ‘nautical’ values. The cultural and local heritage values are seen as less important for the development of nautical tourism initiatives, even if the worldwide trend in tourism development points to the proper consideration and promotion of these.

Obstacles for the development of nautical tourism

Twenty-nine people contributed with 47 proposals. The distance, one of the strengths detected in the previous question as fascinating and attractive, is at the same time perceived as an obstacle to decide, for a big part of the boaters, to travel to Lastovo.

The damage of anchoring on Posidonia meadows

With this question starts the part of the questionnaire wanting to evaluate the awareness about the environmental impacts of anchoring, the will of controlling environmental damages and to see if the fact that 'anchors destroy Posidonia' is known and shared by all stakeholders.

Do you think that the anchoring damages the seabed communities?	
23	Yes
3	No
5	No opinion

During the conversation, 17 people added personal comments about the issue.

The majority (13) wanted to provide their opinions on how bad the anchoring and sewage waste from boats is for the Posidonia meadows and other benthonic sea life.

Other people (4) minimized the anchoring impacts because in their opinion, in some places Posidonia has been already destroyed or is supposed to never have been there.

In which bays is the seabed most damaged?

In which area of Lastovo you believe this impact is the biggest?	
10	Skrivena Luka
10	Zaklopatica
7	Malo Lago
6	Velo Lago
5	Jurjeva
3	Kremena
2	Saplun
2	Pasadur
2	Borova
1	Kručica
4	All bays are damaged

Twenty-three people pointed to 48 spots, the opinion of 4 was that all bays are damaged. Four people did not have a formed opinion.

Investing in solving anchoring impact or not

It is curious to verify that there are more people agreeing to investing in reducing anchoring impact (28/31) than people recognizing that the impacts exist. This does not have to be contradictory: some of them clarify that in their responses that even if they think that the impact is limited, they see as an advantage putting some 'order' and control in the places where boats are located. Installing moorings brings order and safety. Also, some think that instead of buoy fields it is better to create moorings on the coast.

Buoy fields as a solution or not

Do you think the buoy fields can help improving the conservation of the seabed?	
27	Yes
4	No answer

Awareness of the project of deploying buoys

Have you heard about the Park's initiative to deploy buoys to protect the seabed?	
22	Yes
9	No

Support for the plan

Would you support such a project?	
26	Yes
2	Yes with conditions
3	No answer⁸

Two people showed concerns, and they were related with the process design. One said that he would NOT support the deployment if Park was doing it without involvement of other actors, and another one said he would NOT support the idea if management, and thus eventual benefits, was not done by the Municipality of Lastovo.

Personal opinions about installing moorings/buoys

What is your opinion about installing moorings?	
In favour	
4	It is a good idea/solution.
4	It is good to protect the ecosystem and to avoid foreign algae introduction.
4	Brings order, and allows for a decision where boats have to be. One said that 'It helps keeping noisy boaters away.'
4	Improves safety. Many skippers do not know how to anchor safely.
1	Can generate revenues.
In favour but...	
2	There has to be limits. Please no buoys everywhere.
1	Mooring to land, like in <i>konobas</i> (taverns) is better.

Nineteen people provided 21 ideas to the discussion. All but 4 of them were favourable to the idea without conditions. Some were backing up the initiative with conditions/suggestions.

Ideas to reduce the impacts on the sea bottom

Fifteen people provided 16 relevant contributions, which we have classified in the following 4 categories:

Can you suggest some other activities/projects that will reduce this impact?	
6	Increasing capacity of existing already impacted mooring zones
4	Building of a new marina
3	Identify and declare specific boat-free areas
3	Produce and distribute more/better information

Who should operate the buoys

The first part of this question was asking about the perception of the kind of business that buoy fields are at a location like Lastovo.

No one in the private sector subscribed to the option that "It is an expensive investment, likely to generate losses, that has to be funded and run by the government to cover losses", and went directly to take a position on who should operate it, which was a second part of the question.

Mooring fields are an attractive business that can generate net revenues and...	
14	The Park has to setup and operate the buoys and use the revenues to finance the Park operations.
8	The local entrepreneurs should have access to the setup and operation of the mooring fields, because it is one of the few new opportunities for development.
9	No answer, mainly concerned about the process.

The majority is confident that the Park would do a good job of operating the buoys, three people wanted the system to be free of charge for different reasons (not wanting to pay for nature or not liking the buoys to be deployed)?

Job creation

Do you think the mooring project can create new jobs for local people?	
27	Yes / Maybe
3	No
1	No answer

What kind of jobs

Can you shortlist the kind of jobs that you think can be potentially created by this project?	
14	Installation and maintenance of the buoys
7	Charging the fees
4	Waste collection
3	Boat catering with local products
1	Land travel for boaters / sailors
1	Laundry
1	Boat maintenance service
1	New diving club(s)

Promotion of off-season nautical jobs

Do you think Lastovo is the right place to undertake off-season works on boats (marina, boat management, low season boat repairs, boat overwintering, charter bases)?	
22	See that as feasible and suggest ideas.
3	Identify obstacles (lack of leadership, no skills, bad communication with mainland, obstacles in the Spatial Plan).
6	Discard it.

There is a general interest in backing any initiative to increase the jobs creation in any field related to tourism. Dry marina deserves to be explored, some pointed out Ubli as a suitable location.

Using some of the existing pontoon moorings as winter charter bases offering them the place at lower prices than mainland seems to be a possibility for a reduced number of boat owners, and the same goes for setting Lastovo as a base for a number of charter boats.

The need for a better sea link by faster and more frequent ferries is pointed out by many persons as crucial to give way to new initiatives.

A fee to visit the Park?

Do you think it is appropriate that the Park authority charges an entrance fee?	
10	Yes
12	Yes but...
7	No
2	No answer

The majority understands the convenience and the need of an entrance fee, but 12 out of 22 supporting the fee have suggestions or complaints about the way it is collected. Seven persons consider that it should not be applied and only 2 did not answer the question.

Is the price correct?

Do you think the amount charged right now of 25 HRK (3.3 EUR) per person-boat-day is:	
15	Appropriate
9	Too high
2	Too low
5	No answer

15 people find the price correct, this is a majority of the 26 responding to the question. Among those finding the rate too high, 3 people explain that the price is too high, because the sailors do not receive anything in return, and they are using their own anchors. In case that some service was given, they think the amount charged would be fine. Four people think that paying that fee day after day is abusive, and that the fee should be progressively lower or inexistent (only pay once). Two people pointed out that land visitors and guests in the apartments should pay also, because those who pay are angry when they know that land tourism is not paying. Five more people were already pointing this issue in the previous question.

Is it collected properly? How to improve it?

Eighteen people contributed to this question. 10 people think that the procedure is acceptable, and 8 people find it inappropriate.

Do you think the system in use to collect the entrance fee to the Park is correct?	
10	Yes
6	No: the rangers are sometimes rude/impolite and sometimes lacking a correct and uniform procedure
1	No: the system in place is not ensuring that all boats pay ¹⁰
1	No: 'clients do not receive appropriate information or a minimal service for what they pay'

A new fee discourages visitors to stay on Lastovo longer?

Do you think a new fee (or an increased entrance fee for using the buoys) will discourage the stay of visitors?	
17	No
12	Yes
2	Uncertain

All interviewed responded and many reasoned their position with regard to this question. Even those expressing uncertainty, did it not alleging ignorance, but providing some conflicting thoughts that were putting them in the uncertain position.

The increase in the cost or the eventual burden for the visitors of paying two fees were the main concerns, not only in terms of potential reduction of the visitors, but also because this shows an image of inefficiency that they want to avoid.

Destination of the income

In case the buoys operator gets net revenue, I think it should:	
16	be totally / partially reinvested by the Park
1	be totally / partially reinvested by Lastovo Municipality
3	be totally / partially reinvested in specific projects supervised by a specific Board
11	other

The question was originally intended to collect opinions on the decision making process, and not in where-what spending the money. There is an obvious conflict of interests between limiting the number of visitors to an optimal number allowing the protection of an area and the attractiveness of funds provided by a growing number of visitors.

Many of the respondents took the opportunity of expressing priorities:

- The Municipality reminded that in accordance with the existing regulations, the revenues have to be distributed between the county (regional government), municipality (local government) and concessionaire. It expressed concerns with regard to the possibility that the Park was legally able to run an economic activity, which meant that Park could not obtain a concession.
- Some other opinions: Whoever will be buoy operator, it most definitively has to reinvest the revenues – in maintenance, fee collection, hiring of people, projects. And this has to be transparent! If the Park operates the buoys, it should invest part of the revenues into the Park and part in the staff salaries. New buoys could be bought. The most important thing is that the Park develops.

Being active stakeholders: Wanting to be consulted

Do you think the sector you belong to has to be consulted/involved in the details of the buoys deployment?			
	Nautical sector related	Not directly related	Total
Yes	9	11	20
Yes, and also include all other sectors	3	1	4
No	0	2	2
No answer	1	0	1
Glad to have been included in the study, but not feeling necessary to be included in further consultation within that project	0	4	4
TOTAL	13	18	31

Only one person did NOT respond to this question. Twenty-four people wanted to be consulted, and 4 of them stressed that they wanted to see all the local community involved.

Four people related to the administration were not seeing necessary to be consulted, and only 2 out of 14 people not directly related to nautical sector were not interested in following the process.

How to be consulted

How would you like to see this participation happening?			
	Nautical sector related	Not directly related	Total
Contributed	2	7	9
Not contributed	11	11	22
TOTAL	13	18	31

About one third of interviewed did not contribute to this question. The 22 remaining people were giving their opinion, in some cases, raising more than one point. Eleven people consider that all the population has to be consulted as a matter of principle.

Nine people were expecting to be consulted, claiming to have special nautical, touristic, underwater or fisheries direct knowledge. These people looked forward to seeing a formula where their skills were implemented in this and other projects of the Park.

Three people asked for the consultation to be done in low season as not to interfere with their busy summer days.

Two people were reluctant to be involved because they did not believe in the good faith or intentions of the Park authority.

One person cited the participation process used in the Spatial Plan development as a model of how participation should be done.

Wanting to participate in the setup and operation of the buoys

As it was identified in previous question, the opinion of many of the interviewed was favourable to setting up the buoy fields as a cooperative project Park – local entrepreneurs.

Sixteen people responded to the question. Ten of 13 people (77%) directly related with the nautical tourism showed interest in being included in the process of investment, installation, and management or simply to be properly informed in the process, because the decisions made can have a substantial impact on their businesses.

Would you like that you or someone from your family/relatives participates in the...			
	Nautical sector related	Not directly related	Total
investment?	10	3	13
process of installation of the buoys?	7	5	12
management and maintenance of the buoys?	9	6	15
Not wanting to participate but interested in being included in the decision making.	1	0	1
TOTAL	10	6	16

Usually parks have limited opportunities to melt their initiatives with an active and willing local community. Management of whatever project is always simpler if one does it only with its resources and within its limits. In this case it seems worthwhile going for a more complicated process of participation, that will have as a positive side effect the recognition of the Park as fostering and leading sustainable development in a shared model.

COUNTING BOATS: ANALYSING THE REALITY

Continuing the work done in 2012, there was a collection of data in 2015. It was not an easy year and was not possible every day to proceed with the collection of field data. Management issues that Public Institution had with its Management Board resulted in having no seasonal staff for this year. Therefore, the Park did not have enough staff to cover the whole territory and charge entrance fees to all the boats.

At the start of the season, it was decided to collect the following information on the boats:

- Date
- Hour
- Ranger name
- Location
- Boat name
- Feet
- Boat flag
- Crew nationality
- Number of people on board
- Private/charter/touristic boat
- Moored or anchored

If in the future an online permit and/or reservation system (or a community management system oriented to improve engagement of the park users) is set, it would be able to provide additional relevant information that could be crucial to properly communicate with the different stakeholders of the Park.

The available data series for 2015 covers 70 of the 122 days of the season (1 June to 30 September). That means that the rangers collected information on 57.4% of the days.

Total of boats entered in the database/interacted by rangers has been 3,047. When we talk about 'boats' we mean 'boat-day units', because the same boat should be counted once every day it remains in the Park.

The following table shows the number of boats and days that were counted, as well as the estimation of boats.

Boats numbers and days (counted and estimated)

Year 2015	Counted boats	Days	Total days	Estimation of countable boats	Estimation of boats present
June	596	22	30	813	2,032
July	905	17	31	1,650	4,126
August	1,271	20	31	1,970	4,925
September	275	11	30	750	1,875
Total	3,047	70	122	5,183	12,958

It can be roughly estimated that if the rangers had been able to go to sea every day, the total number of interactions with boats would have been of 5,183. The Park authority informed us that the operation capacity (in terms of boats and manpower) was able to cover about 40% of the boats present. This means that the total amount of boats visiting the Park could be very close to 13,000 boats in the period June-September.

This again means that the growth of the number of boats since 2012¹¹ has been of nearly 57%. If the growth has been progressive and steady, this accounts for a yearly growth of a 16%.

The same spokesperson from the Park talks about a very big growth¹² in 2015 over 2014 figures. In this case, this would mean that growths were smaller in 2013 and 2014.

The next table shows the number of boats in 2012 and 2015 and the growth ratio for the 3-year interval.

Boat numbers and growth ratio between 2012 and 2015

Year	Boats	Growth ratio for 3 years interval
2012	8,270	
2015	12,957	56.67%

We will not continue making estimates of possible real data in every particular aspect analysed subsequently and will refer only to observed data. We can consider as representative enough the percentages of the distribution of boats by location, boat sizes, flag, number of people and nationalities, kind of ownership or kind of anchoring-mooring. These data gives a fair idea of the profile of the visitors.

Total and peak count

We proceed to analyse the quantitative results of the data from 1 June to 30 September 2015. The map below shows the location of the bays where counting was done by the rangers. At the same time they were informing visitors on the rules of the Park and collecting the daily entrance fees. In following table we compare data from 2012 and 2015.

Comparison of total and peak count data between 2012 and 2015

2012	2015
The total boat count has been 8,270 in 122 days.	The total boat count has been 3,047 in 70 days.
The maximum number of boats present in one day was 204, and the minimum during that period, 18.	The maximum number of boats registered in one day was 118 (estimated 295), and the minimum during that period, 5 (estimated 13).
In only 23 peak days – with more than 89 visitors – Lastovo received the 50% of all the visits in the period, leaving the other 50% 99 days to have a more spaced distribution.	In only 18 peak days – all of them with more than 55/138 boats registered/estimated – Lastovo received the 49.6% of all the visits in the period, leaving the other 50% 104 days to have a more spaced distribution. We detect a clear trend of increasing the peaks.
5 days registered figures of more than 150 boats in the archipelago.	13 days registered <i>estimated</i> figures of more than 150 boats in the archipelago.

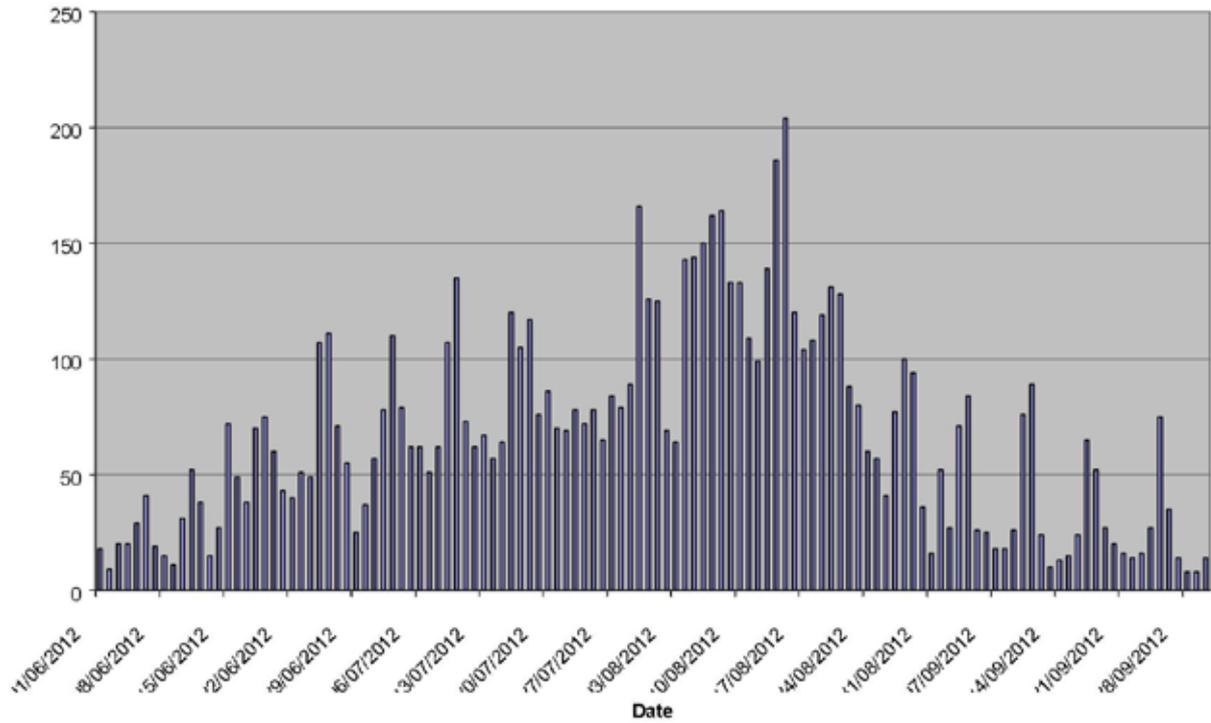


Boat counting locations 2012

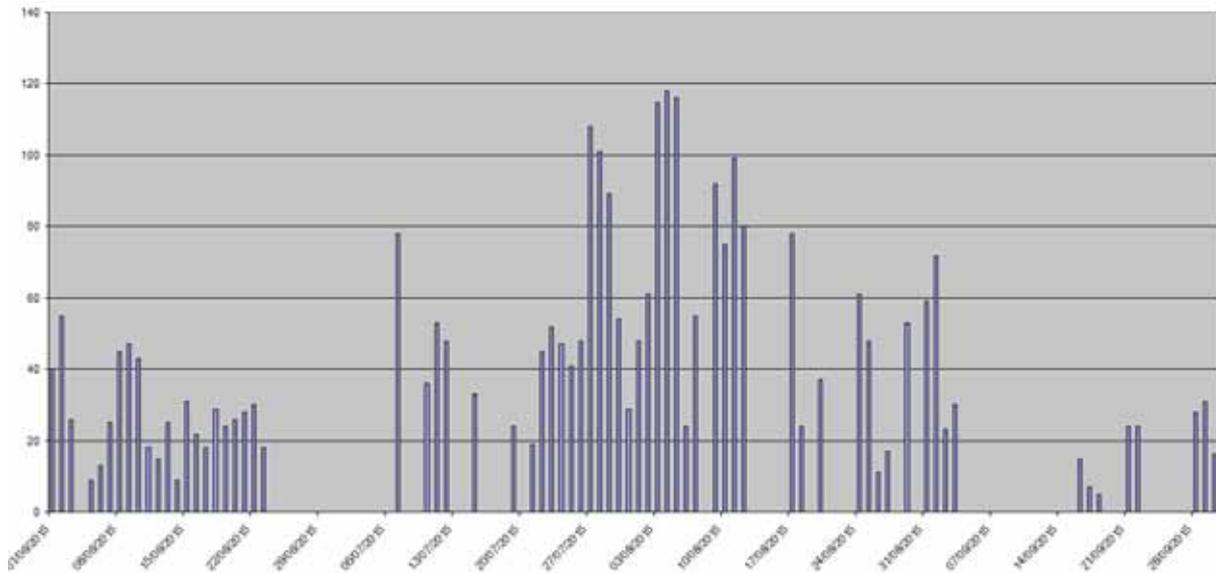
Boat counting areas, locations and codes

AREA	LOCATION	CODE
West Area	Malo lago	ML1-3
	Vejo lago	VL1-7
	Prežba	P1-2
	Makarac	M1-2
	Kručica	K
North Area	Ubli	UB
	Korita	KO
	Zaklopatica	Z
South Area	Lučica	L
	Vejo more	VM
East Area	Skrivena luka	SL
	Saplun	S1-6

Total boats count per day in 2012



Total daily count of registered boats in 2015



• Note: The empty days are the days that rangers did not collect data.

Location counts

The analysis of the daily data, grouped by location, allowed for the identification of the favourite places where the overnight stays took place during the summer 2012.

Jurjeva Luka, Pasadur, Zaklopatica and Skrivena Luka accounted for more than 70% of the total.

Locations that are not completely protected from possible wind changes or situated more than 2 nautical miles far from services (Kručica 2 NM, Saplun 5 NM, Mrčara 2 NM) accounted for a very small demand.

More than half of the boats were concentrated at the 3 locations with existing infrastructure (Skrivena Luka, Zaklopatica and Pasadur).

The data collection about locations has been refined in 2015 and the rangers have made an extra effort by identifying subareas of the 2012 original plots. This has the potential of giving excellent information about the presence of boats in every anchoring/mooring place, but the high number of locations makes the comparison with the 2012 study impossible.

Given that absolute figures cannot be used, we propose to compare the percentages that give us a spatial distribution of the data that is very similar in 2015 to what was recorded in 2012, except for the fact that Skrivena Luka has apparently increased its attraction to sailors, while Zaklopatica and Vejo Lago areas lose visitors.

Weekdays analysis

As we saw in 2012, the weekly evolution of the numbers of boats is different to the trends existing in the mainland or in areas close to the main harbours.

These receive a daily flow of holiday visitors that is increased during the weekends, because the locals not having holidays sail around as day-trippers or weekenders.

Lastovo is rather distant from the big marinas based on the coast, and is not a preferred spot for weekenders or day-trippers, because a considerable amount of time and fuel to arrive to the place is needed.

The 2015 data was analysed in a different way than in 2012 due to the fact that some weekdays had more field sampling effort. So we made the sum of observations in every weekday and divided it by the number of working days.

Mondays and Tuesdays are the days with more 2015. The week cycle has everything to do with the fact that the numerous charter companies based on the mainland work in weekly cycles ending on Friday. The people renting a boat, especially if it is a sailing boat, set Lastovo in the middle of their route. They likely plan several stops before the arrival to Lastovo.

They arrive on Monday-Tuesday and spend one or

two days on or around the island. To deliver the boat the next Friday in the base port, they usually leave on Thursday.

On one side, this is a bottleneck that keeps an important number of visitors away from Thursday to Sunday.

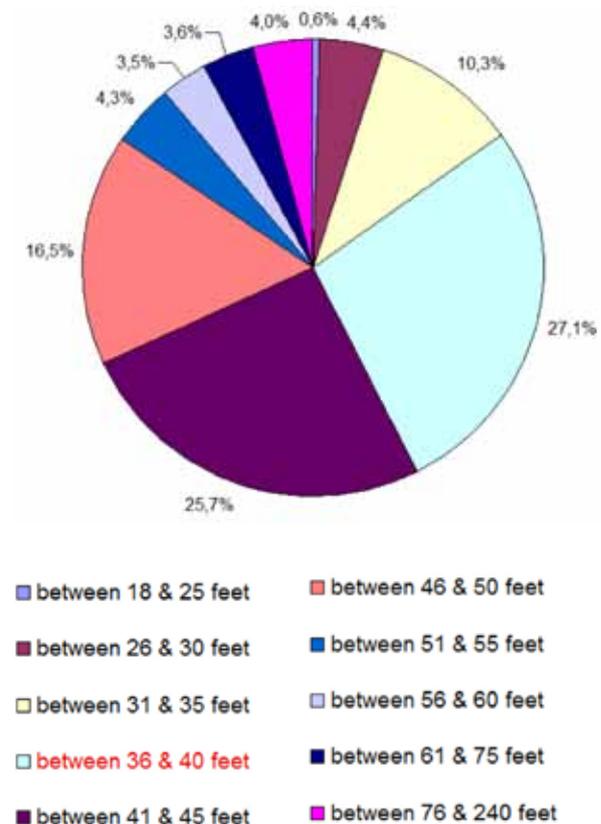
On the other side, an opportunity deserving analysis for local entrepreneurs appears: it is more than likely that a number of travellers would like to spend a full week sailing-mooring in Lastovo, thus increasing economic return to the island. This can only be achieved by the rental of a sailing boat with base on Lastovo, or by renting a boat for 2-3 weeks. As a Split charter company representative told us during an interview, 'Lastovo is too far for regular charters that are rented for one week. In case a charter is rented for 2-3 weeks, then they have time to go to Lastovo and they usually go there.'

How big are visitor's boats?

The collection of accurate information about boat lengths gave us a good series of data that allowed a precise characterisation of the boats visiting the Park.

3,016 registered boats out of a total of 3,058 provided length in feet³.

The following graph registers different boat sizes in categories of 5ft (starting at 18ft until 60ft; bigger sizes, less relevant, are grouped in two final categories).

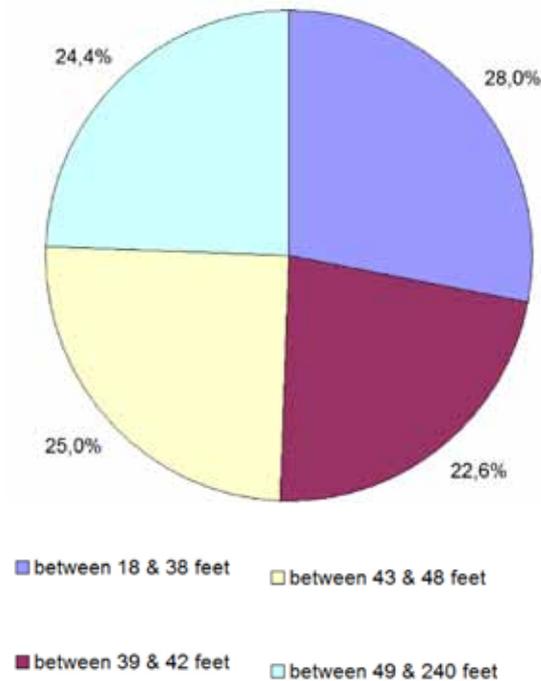


Boat sizes in categories of 5 ft.

The most 'popular' boats are those between 36 and 40ft (11 to 12m), accounting for a 27.1% of the observations.

If we take the two most common categories, the 53% of the observations are of boats between 36 and 45ft (11 to 14m).

If we try to divide the figures in four categories accounting approximately for 1/4 of the boats each, we have the following distribution:



Quartile distribution of boat sizes¹⁴

Boat Flags

Croatia, Italy, Germany, Slovenia, Austria and Great Britain are the most frequent flags in the Park. These 6 nationalities are accounting for 90% of the boats visiting the place.

21 more European nationalities sum up to the 97.74% of boats visiting Lastovo.

The remaining 2.26% is formed by boats with flags from America (44 sightings of 4 countries, 1.5%) and Caribbean, Australia-Pacific and South Africa (22 sightings of 7 countries) that complete the kaleidoscope of nationalities.

No boats from Asia or Africa (except one from South Africa) have been seen on Lastovo in 2015.

Number and nationality of visitors

It has been possible to determine the nationality of the people on board 2,726 boats.

A total of 10,403 people of 43 nationalities have been recorded, and the mean figure of people per boat is 3.8.

In the case of boats, the Croatian flag was leading the list because there are many charter boats from Croatian companies.

But when we go down to the nationalities of the crews, much of them are crewed by other nationals. For example, 286 boats have been registered with Croatian nationals on board, while 1,260 Croatian flag boats show up in the previous section data.

Having said that, the 6 top nationalities of visitors are the same as the 6 top flags, but in different order. The mean number of people in each boat has a wide variation, being higher in boats of remote nationals that charter and fill bigger boats, in comparison to people from the area (Italy, Croatia, Slovenia) that use smaller and less crowded boats.

Private, Charter or Touristic boats

The information relative to the ownership of the boats is also fragmented. Not in every case was it possible to collect information for every boat about the owner, and at the same time the number of people present on board.

The ratio private : charter regarding the number of boats is roughly 17:10.

In terms of volume, the registered figures for touristic boats are negligible (below 1%).

The number of boats with regard to ownership (charter, private and touristic) and number of people on board were recorded. Given that the number of people in charters is 31% higher than in private boats, the prevalence of the private boats over the charters is sensitively reduced, and the ratio private : charter number of visitors is 13:10.

We can make a guess of the total number of people visiting the Park using the total estimation of total boats, distributing them in charter/private according to the existing sampling, and using the mean number of people sampled by the rangers as detailed in the following table:

Ownership	Ratios	Boats	Persons/boat	Estimated Persons
Charter	36.7%	4,750	4.9	23,326
Private	62.7%	8,127	3.7	30,347
Touristic	0.6%	80	13.1	1,049
TOTAL 2015		12,957		54,722

Moored or Anchored

Numbers and percentages of boats (with regards to the ownership) that were anchored and moored on Lastovo in 2015 were recorded. The boats registered in the database were found distributed in anchorages or moorings in a proportion close to 1:1 (53.6% to 46.4%), but the owners of private boats were a great majority (1.796 private boats : 994 charters, a proportion of 19:10 or, on other words, 2/3 of the boats are privately owned).

On anchor, the ratio private : charter was 24 : 10, while at mooring it was 13 : 10.

We then calculated how the ownership makes a difference in the selection of the place to stay. The analysis of the same figures shows a preference for moorings in case of charter and touristic boats and

for anchoring in case of private boats.

Unwinding from the total visitors' distribution figure estimated in the previous chapter, and distributing it between anchoring and mooring, we have, as a new estimation, the figures of visitors that rely on each option.

Please note that the total figure for private boats on anchor is much higher than the other categories, while the total figure for moored boats is split close to a half-and-half ratio between private and others.

Ownership	Anchor	Mooring	%	Anchor	Mooring	Total
Charters	44.3%	55.7%	100.0%	10,325	13,001	23,326
Private	58.9%	41.1%	100.0%	17,860	12,487	30,347
Touristic	41.2%	58.8%	100.0%	432	617	1,049
TOTAL				28,618	26,105	54,722
Percentage				52.3%	47.7%	

BUILDING A STRATEGY TO MANAGE DEMAND

Limited investment and operation budget is a reality all over the world, and at some point a manager will have to decide the roof for the number of boats admitted daily to fulfil the conservation objectives. This means that, as a first consequence, some boats will be not able to have a mooring, and some management mechanisms have to be put in place to prevent overbooking and accommodate visitors in subsequent days.

This is important in one hand to avoid the seabed damaging by allowing uncontrolled anchoring as a result of last minute arrival of unexpected boats. But in the other hand it is good to setup mechanisms to redirect visitors to less busy days in order to satisfy their interest in the destination and to allow the economic benefits of their visit for the local population.

Options to avoid being entangled in a 'offer managing strategy'

In a normal unlimited growing business scenario, the usual way to reach the 'success' is to welcome the continuous growth of the demand and in response increase the offer trying to reach more clients, thus increasing business figures and benefits.

But in an island natural area, where natural limits are evident, decisions have to be taken to harmonize human activity with nature conservation, searching for what has been defined as "finding a compromise between the need for preservation of natural areas and the need for economic development"¹⁵.

Reaching sustainable qualification in this case can be achieved by defining and keeping marine activity below some allowable figures. It is convenient to define daily roof figure for every bay, an accumulative roof figure for all the islands, and monitor the growing of the demand to see if it is possible to manage it without a need for growing of the offer.

The fact that the distribution of the demand along the time has a clear peak in the middle of the season and a steep descent in both ends of it, allows some room to deploy strategies to attract the demand in the non-peak days.

Regular boat counting of the numbers of boats every year, preferably per bay, and monitoring of the 'health' of this strategic sector, sharing and discussing the meaning of yearly figures with local entrepreneurs. Main benefit of the monitoring would be having consistent data, avoiding subjectivity and helping in the adoption of an strategy to encompassing the growth of the local offer. If the nautical sector is successful, it is probable that many new entrepreneurs would come up with new offers to the sailors, so the 'pie' would have to be shared among more initiatives.

If the offer grows every year in a UUU manner¹⁶ the resulting subjective perception would very likely be that 'the business is going worse' (even if total income is higher from previous year), because offer is growing at a higher pace than demand. This means that the rate of demand from sailors coming to Lastovo is growing at a lower pace than the rate of growth of the different offers from entrepreneurs. If this happens, on average each entrepreneur would have less profit, although nautical sector as a whole is growing.

Registered demand and nominal capacity

We can define as 'daily capacity' the number of boats that can be hosted in the archipelago using a number of buoys.

The 'nominal capacity' for a period of time is the number of buoys multiplied by the number of days that the buoys will be operating (usually dismantled in winter).

The 'excess of capacity' is the difference between the nominal capacity and the number of boats observed in this period while 'Lack of capacity' is a counting of how many boats cannot use the moorings in peak days. One can have a great excess of capacity and at the same time suffer lack of capacity in some moments.

Dimensioning whatever infrastructure with some excess of capacity is usually welcomed, because it allows absorbing the variations of demand caused by unexpected factors.

But running a supersized infrastructure is costly in terms of investment and maintenance. It is far more convenient to use the demand management strategies to accommodate and 'educate' the demand.

Using the numeric model shown in chapter 8.7 of the 2012 study, we can calculate how many boats can be hosted in 4 months (122 days) using different amounts of moorings.

Looking at the figures below, it is easy to see that installing as many moorings as the maximum boats observed (204) avoids the occurrence of any incidence of lack of capacity, but sets a system with an excess of capacity of 200%.

This is too much, seen from every point of view. Setting up an infrastructure that is mainly out of use can be interpreted as bad use of investment funds. A reasonable balancing point can be the installation of 140 moorings, creating a nominal capacity of 17.080 boats-day. Even if there is a small (5%) lack of capacity, this can be easily managed, by moving the demand to non-peak days, because there is an excess of capacity of 8.810 boats-day.

Demand in 122 days of 2012 (1 June – 30 September): 8.270				
Installing that amount of moorings	Lastovo would have this nominal capacity for the same period	Excess of capacity	Excess of capacity (%) that can be used with demand management strategies	Actual lack of capacity (%) without demand management
124	15,128	6,858	82.93%	10.00%
140	17,080	8,810	106.53%	5.00%
170	20,740	12,470	150.79%	1.00%
204	24,888	16,618	200.94%	0.00%

As we have seen, there is an important daily variation in number of boats. In the table above, we calculated how many overnight stays could be managed with different number of moorings, and the percentage (%) of extra capacity available in each case.

Management measures can distribute this variation along the summer months, making the stay to visitors more pleasant and the rhythm of service more steady, thus the work would be more profitable to locals.

Setting a maximum of boats allowed to stay overnight on the island

In general, public tendency – in this case public means both locals and sailing users – is to not accept limitations as such. In particular, limitations in numbers are not welcomed.

It is necessary to properly communicate the reasons and the facts leading to that decision, and the associated decisions taken (demand management strategy benefits) to mitigate the perceived negative impact associated with limitation of any activity.

Decision-makers should consider these factors:

- The maximum number of boats allowed has to take into account the total peak registered figure. Once the anchoring problems created in Posidonia meadows are resolved by buoy moorings, the visual, noise and water pollution impacts have to be considered.
- Total financial capacity that will determine the maximum number of moorings that can be deployed.
- The composition of the fleet that has to be hosted on Lastovo according to the registered demand (bigger moorings are more expensive).
- Different kind(s) of mooring(s) have also different costs; an intelligent distribution of convenient moorings can assist in reaching a financial optimum.

- The willingness and capacity for deploying a demand management strategy, including a reservation and/or permit system.
- The discussion of the strategy with the local community and their endorsement is key for the success.

Setting a maximum number of days to stay

High demand in peak days puts on the table the issue how many people have to be granted access to the Park in a certain period of time.

Demand accommodation techniques are needed and used in many places to solve this, if deemed necessary. If some people stay for weeks in a Park where a maximum number of boats are allowed, they are blocking the access of other users to the place.

The need of maximizing the possibilities for different users to enjoy the place can be detected if proper bidirectional communication channels with the users are set.

If the setup of a turnover schema seems convenient to distribute the demand of the peak days, it can be implemented according to the needs, and a reservation system is the easiest way to have it done.

FIXING SYSTEMS

In the study delivered in 2012 a detailed description of different fixing systems and options to distribute boats along a diverse coast were analyzed.

The size and different morphology and nature of the bottoms of the coves and anchoring spots of Lastovo recommend the use of diverse fixing systems.

Holding safely a boat in a swinging anchoring or in a mooring needs a variety of elements. The usual solution is to have floating buoys allowing the picking of submerged lines tied to some bottom fixation (corpo morto, bottom screws, chains on rocky bottoms, etc.).

‘Corpo morto’ is the safer, traditional and reliable

way of holding boats in place. In some locations, complicated webs of bottom chains are used to connect concrete blocks between them and to hold mooring lines. We do not recommend this system due to the diverse physical impacts it produces in the site.

Posidonia meadows have always some sand patches where they can be located. Even if there was a continuous meadow, the benefits of stopping the anchor use justify the deployment of concrete blocks (usually less than 1 sqm per Ha).

The use of 'eco-anchors' and 'eco-screws' has enthusiastic backup and makes easy way in marketing. Low footprint, easy to install and somehow cheaper, the sediments need to be tested to see if they are suitable for them and each and every anchor needs to be carefully stress tested after installation and periodically revised. The physical and chemical characteristics of the sediment will determine the life of the screw and the reliability of the holding.

Chemical fixing of metallic anchorings using drilled or natural holes is frequent and useful in rocky bottoms.

In all cases, care is needed to prevent that the lines touch the bottom, specially if *Posidonia oceanica* is present. This is possible by producing custom lines for each mooring and installing intermediate buoys to hold them floating far from the bottom.

Given that the boat owners are not allowed to use their anchors, the provider of the mooring is responsible of the proper maintenance of the mooring. To limit the responsibility of the operator, a maximum boat size and wind speed safe limit is calculated for the selected mooring. An insurance is subscribed by the mooring operator to cover possible damages of an eventual breaking of the mooring system if occurred within the safety limits operation. This information needs to be communicated to the users at the moment of the mooring, and is a good idea to have it clearly written on the buoys.

For boats of very big size the cost of the installation, maintenance and insurance of the anchoring/mooring devices can be very high and so it is reasonable to identify a specific place where these boats can anchor, or in the necessary case, allow them navigation but not anchoring in the MPA.

DISTRIBUTING THE BOATS

In Lastovo, given the high number of possible mooring-anchorage places it is possible to distribute the visitors boats in a way that the Park can achieve

- Minimal physical and biological impact in the bottom
- Good distribution in the MPA for managing and enforcement purposes.

- Keep boats away or at a proper distance from sensitive areas
- Concentrate boats in zones where their visual impact is acceptable to all park visitors

Visual impact considerations of mooring fields have a great subjective component, and it is difficult to reach an agreement about what is better or worse to protect a landscape that can be perceived as 'natural'. Some people find the image of boats in a bay beautiful and inspiring, while others see them as artificialization of nature, unacceptable in a protected area.

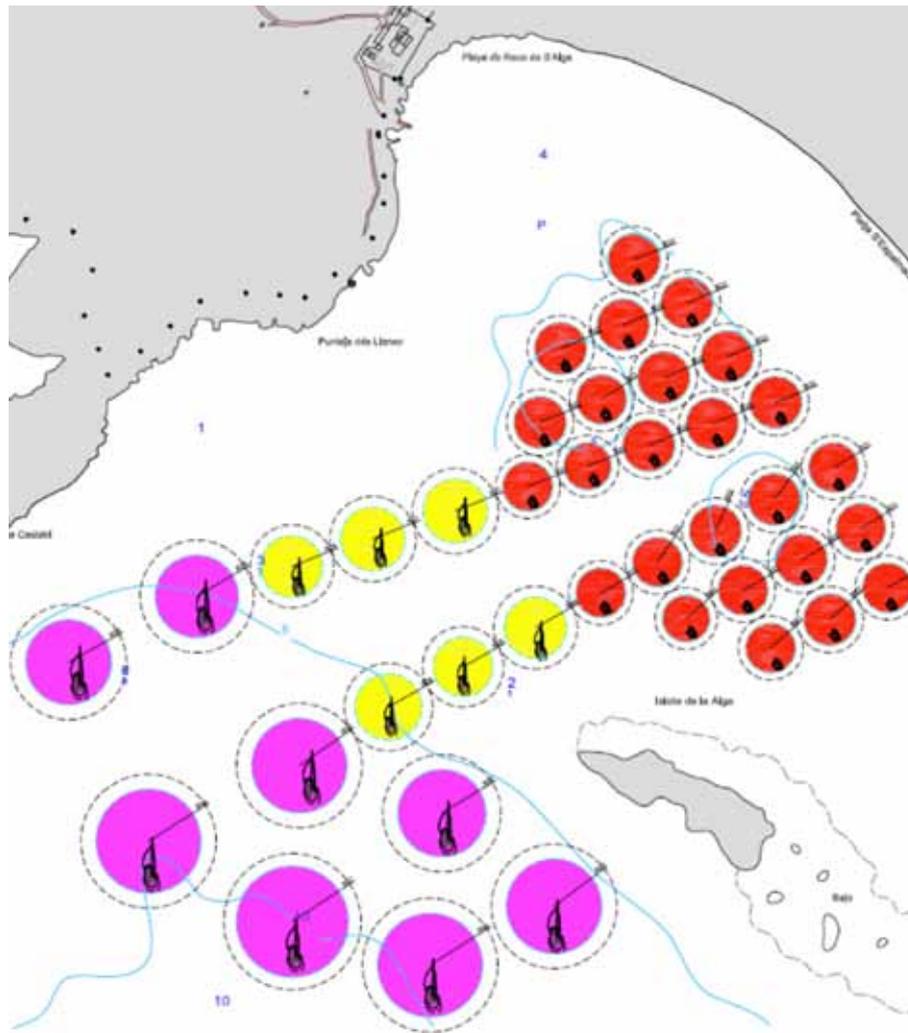
Given that the nature parks are managing common public assets like landscape, it is good to make an exercise of flexibility and try to understand different positions. One possible strategy is to concentrate boats in specific areas, giving as a result the visual impact of the boats present, with a visibility from some selected point(s) of view, but no visibility from other points of view, from which the natural area can be appreciated 100% free of artificial elements. That option has the potential of being good for all the visitors and also for the boaters that are set in one side of a cove, because they can have, in front of them, a pristine view of the natural area.

The most usual systems used in the Mediterranean are:

1. Free turning boats moored bow-to in buoys attached to concrete blocks or screw moorings.
2. In-row mooring, in zones close to the coast.
3. Mooring to land with laid lines, commonly used by konoba (tavern) owners to service their customers. This system allows maximum 'package' of the boats, and sailors can jump to land easily, without needing to use the auxiliary boats.

In the 2015 interviews we have seen that crews of charter boats tend to prefer to moor in Konobas or marinas, being more prone to use the restaurants and going to land, while private boats are more prone to stay at anchor in a more disconnected option of enjoying the site. Charter boats use to have crews for one week, and are more likely to step down to land, rent a bike or a car, have lunch and/or dinner in the local restaurants.

Crews from private boats use to be well provisioned and are more prone to stay onboard. Some communication specifically addressed to them can help attracting them to visit the terrestrial part of the Park.



Proposal of a mooring field distribution

Comparison of qualitative aspects for different deployment solutions								
Mooring system	Concession economy	Maintenance costs	Conflicts with swimmers – other coast users	Pollution control	Privacy for users	Easy mooring	Visual impact	Need of auxiliary boat to visit land
Free turn (circular swinging)	More expensive	Medium, varies with depth	Low. Can be located in convenient places to avoid conflicts.	Need to rely on holding tanks. Less density / ha.	Highest	Easiest	Disperse, but covering bigger surfaces.	Yes
In-row (bow-stern)	Medium	Usually cheap, varies with depth	Low. Can be located in convenient places to avoid conflicts.	Need to rely on holding tanks. More density / ha.	Medium	Medium	Can be concentrated in areas away from general observation points.	Yes
Mooring to land (konoba style)	Cheapest	Medium	Highest. It usually has conflicts with swimming and other uses.	Part of the pollution can be avoided by using land-based services.	Lowest	A bit more tricky	Concentrated, associated usually to built areas.	No

Table: Comparison of qualitative aspects for different deployment solutions

WHY A PAYMENT TO ENTER LASTOVO ISLANDS NATURE PARK (AND HOW)

The majority of Marine Protected Areas under whatever regime (reserves, sanctuaries, marine parks or national parks...) have detected that some restrictions in the normal operation of boats and people are needed. The intensity and/or the kind of activities done by humans on board of vessels and on land are usually scrutinized and, depending of the conflicts detected between these activities and the conservation objectives of the protected area, they face time and/or zone restrictions.

The rationale of these limitations is usually described and put in the appropriate frame in the Management Plans and then they are subject to periodical check to validate the achievement of the conservation goals. A usual way of enforcing the restrictions includes issuing of permits and/or the payment of a fee. This uses to be done to keep track and monitor the activities of the visitors up to some limit. Collecting a fee is an instrument to raise funds but also can be set to moderate the demand to fulfil the conservation objectives. In the Environmental Economy manuals, the entrance fees are considered useful economic instruments, and are thoroughly described as double-edged swords that can be used to collect resources to maintain protected areas or to reduce visitors' pressure by increasing the prices to the right level according to the elasticity of the demand. The goals of raising funds and modulating the demand have to be discussed and set in a process known by all stakeholders. In some cases both goals can be pursued simultaneously. According to the Law on Nature Protection¹⁷, visitors arriving in boats (not ferries) are required to pay a fee when entering the waters of Lastovo Nature Park.

This is actually part of the framework designed to generate part of the much-needed resources to sustain Park management, so visitors are charged a fee, which is currently a daily fee.

Following table resumes the figures of income generated by the Lastovo visitors' daily fee during last years.

Number of visitors, boats and income (2012-2015)

	2012	2013	2014	2015
Number of overnight stays (on land)	41,906	39,996	41,933	N/A
Number of visitors (on land)	6,072	5,602	5,414	N/A
Total income (land) (EUR)	0	0	0	0
Number of sold entrance fees (boats)	31,196	29,792	21,209	17,997
Total income (boats) (EUR)	124,784	119,168	84,836	71,988
Number of boats	8,270	N/A	N/A	3,047
Mean income/boat	15.09	N/A	N/A	23.63

Sources: Lastovo Municipality Tourist Board & Lastovo Islands Nature Park

Visitors coming by ferry currently do not pay the entrance fee. Visitors coming in private boats are charged a fee depending on the number of people in the boat, but there are plans to start charging by the boat size. As the numbers of visitors are increasing along the years, the cost of collecting the fees is also growing. The traditional way of collecting the fees is by far less cost efficient than modern systems using electronic payment.

Calculation of the cost of the fee collection is presented in the following Table.

It relates to the season (June – September), which is when Park currently charges entrance fee to nautical tourists.

YEAR	PERMANENT STAFF (EUR)	SEASONAL STAFF (EUR)	PETROL (EUR)	TOTAL (EUR)	Income from collected fees	Cost of collecting 1 EUR	Income per spent EUR
2009	3,250.35	3,901.48	3,901.48	7,802.97			
2010	3,250.35	6,442.92	6,442.92	12,885.83			
2011	3,250.35	10,057.02	10,057.02	20,114.03			
2012	3,250.35	9,593.12	9,593.12	19,186.25	124,784	0.15 €	6.50 €
2013	3,250.35	7,808.63	7,808.63	15,617.26	119,168	0.13 €	7.63 €
2014	3,250.35	6,944.33	6,944.33	13,888.66	84,836	0.16 €	6.11 €
2015	3,250.35	4,521.87	4,521.87	9,043.73	71,988	0.13 €	7.96 €
TOTAL	22,752.43	49,269.37	49,269.37	98,538.74			
Total for 2012->2015				57,735.90	400,776	0.14€	6.94€

Data supplied by the Park administration show a good correspondence between the cost of the effort of collecting the fees and the fees collected.

The collected fees figure, available for the period 2012-2015 has been reducing progressively in the same proportion that less seasonal staff has been contracted and thus less petrol has been consumed. Each euro spent in the operation has been generating close to 7 EUR, which means a net income of 6 EUR.

It seems more than worthwhile to extend the fee collection to all days in the season. If the income can be reinvested in the Conservation programs of the Park, the benefits are clear. More, this is an activity that creates seasonal jobs. If these jobs are given to locals, this is a winning initiative.

In the case that an electronic payment system is set, the intensity of patrolling can be reduced but our counsel is to maintain a clear presence of the patrolling boats to fulfil all the usual tasks of control, information and monitoring of the visitor's activities.

Advantages of an electronic payment system: Analogue vs. Digital

- The traditional paper based administrative process consisting more or less in a linear process (each step has to be finished in order to start the next one) usually takes up to six steps:
 - application
 - registering
 - consideration by the authority
 - payment validation
 - receipt sending via mail or fax in the best case scenario

- obligation/need of the user of printing and having the receipt ready for presentation to the relevant authority

Furthermore, this process is very demanding in terms of human resources, and the peaks of demand can potentially be clogging and collapsing the Park Administration if they try to manage the demand in a traditional way without a very well organised, and therefore expensive, human team.

The analogue files of documentation allow the subsequent analysis, but it takes extra work to type the desired data in appropriate software to proceed to statistical analysis and facts interpretation. The cost of the process grows proportionally with the growth of the paper file.

Actual web based systems can take most of the burden out from the Park Administration desks. These systems rely on the fact that applicant 'side' does the biggest part of the work of feeding details into the system. Either the ship captain himself or some person related to the visit to the Park will finally do the job. The charter company, the harbour assistant during the approach to Lastovo, the owner of the restaurant in the island or a friend sitting home in Sweden having the right information and details can place the needed information in the system on behalf of the ship captain.

There is the need for an initial investment but after the setup, the marginal cost of doing 1000 or 5000 transactions stays nearly invariable.

In order to deploy smoother and friendly processes that speed up the actions and increase productivity, the electronic administration has to switch to non-linear processes where the registration and uploading of necessary information can be done in a flexible way.

In-house or outsourcing

The Park administration has various options:
 Set up a full system to undertake and provide a custom process in Park's own premises:
 Long process involving analysis, programming, testing, debugging
 Expensive
 Server maintenance optional
 IT skilled person(s) in staff, expensive and risk of volatility
 Upgrades and updates need to be done with the evolution of new trends and needs (new community managing trends, evolution of the payment platforms and firewall system)
 Explore and contract among many platforms providing electronic services:
 Using a platform that already has servers, programs, programmers and experience in the field has the potential for saving money and time
 Whenever an improvement, upgrade or adaptation is done in the platform, this improvement is shared by all users
 Costs of upgrading security patches or bringing software to new laws compliance are shared by all users
 Costs can be linked to reservations, so even if in some cases there is a fixed fee for using the system, the cost of the platform operation is usually a % of the income that passes through the system
 The payment can be done using different payment platforms, and the work force to undergo the database updating and payments can be anyone: the users, Lastovo konobas personnel or the administration staff of charter companies and marinas.
 Flexibility is also key. Allowing the users go through the process of reservation and payment even if some document is missing, under the agreement of supplying it in appropriate timeframe in order to keep the database updated.
 When the system to collect the necessary information to deliver electronic authorisation will be up and running, the Park will be able to access detailed information on each boat characteristics, and keep the details regarding time, nationalities and number of people on board.
 Analytic requests to the database intended to feed planning and managing decision-making will be possible.

Benefits of electronic pre-payment

Advanced payment.

Having collected the cash even before the boats arrive is for obvious reasons a real advantage for cash flow balance of the Park.

Alleviating ranger tasks.

It allows rangers to concentrate on their core tasks,

surveillance and enforcement, and also devote time to courtesy and information interaction with visitors.

Reducing cash use and the risks of money loss

Because rangers would not have to manage tickets, do daily conciliation of cash registers.

Minimising risk of arbitrariness

All over the Mediterranean, there are urban legends about rangers in marine parks or even harbour assistants in commercial marinas by-passing the correct procedures, exchanging verbal permits by money or gifts. Mandatory pre-payment significantly reduces the possibility of that happening.

If rangers have in their hands an alphabetically sorted listing of the boats supposed to be in the park, they just need to spend a little bit of time to approach and check the boat identity.

It is likely that some boats will arrive without the issued permit and paid fees. In this case, it is useful that the rangers are equipped with a minimal equipment (an Android smartphone costing 200 EUR can do the job) to help the visitors in the processing of the application. If in the moment the rangers arrive to the boat for inspection they detect that the permit has still to be issued, the access to the platform can be done using whichever Internet access device. In that moment, with the appropriate Wi-Fi or 4G signal, registering and payment can be done online, or via the old-fashioned offline system, that needs to coexist for special cases.

Benefits of validated information

Until now, the hand collection of data in the field by the Park rangers has shown up as a time consuming task that can cause conflicts with other, priority tasks.

In the actual situation, as limited funds make impossible the setup of the field team that is able to go at sea to collect the fees from all the boats present in the Park at a certain time, then detailed data collection will also be impossible.

On top of that, relying on information collected by hand on board of a patrol boat has inconveniences and also allows potential creation of low quality data in many ways. Apart from the possibility of not collecting all required data from each boat, the inconveniences of collecting information in the field are:

Duplication of efforts

Collecting the same information from the same boat every day is easy if the boat changes place and also if the team of fee/data collection is not the same. This will end-up disturbing unnecessarily the visitors, showing a poor efficiency image to them.

Loss of information

Some information, like number of people on board, nationality of the crew or others, cannot be obtained if the crew is out of a moored/anchored boat for whatever reason.

Collection of inconsistent data

Different observers can generate different data for the same boat. Looking at a flag to determine the nationality of a boat can produce errors, because boats show different flags (national, Croatian courtesy flag in case of foreign boats...). If the right information about boat length is not provided by the owner, guessing the boat length by looking at the boat can produce big differences from one observer to another; also, confusion in the units used (meters or feet) is possible, so it is better to have the data filled by the owner in a web form.

Abbreviations

Abbreviations for nationalities are another source of confusion. Slovenia and Slovakia can be wrongly stated easily, or Switzerland and Sweden can be mixed up, Switzerland stated as S, CH or CHE...

Typing all the info daily

This is a time-consuming desk job that can also introduce errors in the data by mistakes or misinterpretations of hand written notes.

With the data collected online, the Park management can produce listings of the boats that are expected to be in the Park every day; if the rangers take a copy of these listing with them, they will need only to fill out some eventually missing information, and collect the data from the boats that, for whatever reason, are in the Park and not in the listings. The reasons can be multiple, but usually they include:

- Boats arriving without knowing that the online payment and reservation system exists or even that a payment is mandatory;
- Boats arriving earlier or leaving later than scheduled
- Boats sheltering in bad weather.

PERMITS+MONITORING: COLLECTED INFORMATION SERVING DIFFERENT PURPOSES

Like in every port/marina, a boats database needs to be built with the basic info of each visiting boat and skipper to manage the reservations and inspection and to fulfil legal requirements.

The same information can be used for different purposes: if properly structured it can provide the data needed to:

- fulfil legal requirements for permit allocation and tax collection
- produce listings helpful to the rangers to verify what boats entered the park and to monitor nautical activities
- elaborate the monitoring statistical analysis on kind of boats, size, flag, nationality of crew, positions at the moment of inspection, number of people, charter or private, etc.
- communicate periodically with the registered users in order to spread park information at different levels (administrative, ecological, touristic, social...) via different channels as email, Facebook, Twitter and create a sense of ownership in the community of users, allowing a fluid bidirectional communication among Park management, local community and visitors.

Observance of the collection protocols and security under the existing laws on data privacy protection has to be implemented thoroughly¹⁸.

BOAT REGISTERING

For the ease of use of the system, the existence of database with two main master tables, one of boats and another of skippers is useful to fulfil the legal requirements and especially when there is a significant number of them that can be returning many times during the season, even throughout the years. Making things easy to everyone using the system is essential to reduce the burden of managing a system to provide thousands of entrance fees monthly, holding also thousands of boats and skippers.

It is good to promote the registration of boats and skippers even before they actually come, to keep a wide database of those interested in coming someday.

Orienting the system that way, the issuing of the daily tickets will be easy: by picking boat and skipper from the database and then selecting the dates of travel and a few more items, no more information needs to be collected.

Outmoded lineal procedures

In the old fashioned permit systems, each user has to introduce boat data, personal data and travel information to get a permit for these days.

The permit is issued using this information, and the data is kept or not, but in case of a new permit, all information needs to be typed and resent. There is no way that the user and the administration can retrieve the previously provided info to reuse it again and again.

This is the way many organisations use computers and hard disks: like pencil and paper, mimicking the old bureaucracy, and creating even more trouble than when the process was done manually.

Using digital resources

There are ways to use the digital resources in a much more efficient way. Allowing users to store, recover, edit and restore their basic information first, and then adding the travel information each time they return is much easier, and also has less connection time requirements.

This is good for any application for users-administration communication, but it is much more important in the case of boats, that usually rely on expensive foreign roaming connections (that are not always properly working).

The ideal system to manage data from users and issue permits will look much like an internet shop where you can have your preferences stored, wish lists, a history of your permits ('purchases'), etc.

Also, this system provides the Park managers with the possibility of contacting the users to do evaluation of visitor satisfaction or provide them with whatever kind of information that is considered interesting to improve the quality of the visit. Sometimes we use these systems without using the flexibility they are able to provide.

The tools and interfaces to access the database to go through that process can be as simple as free software like an Internet navigator used from any computer, tablet or smartphone, but it can be speeded up by having a specific application (App). The majority of the airlines, trains and ferry companies have apps that speed up, by keeping it simple, the process of reservations. They access the system with the user identification and go for the step-by-step process of selecting the elements from a personalized 'favourites' list of elements.

For example, as seen from the public side, a user can be:

- a person owning a sailing boat, who will manage her/his own data (boat and skipper) or
- a charter company, that should be able to create, with a single user, a number of records for each boat of the company, and also create as many records of skippers as needed, one for each professional skipper under contract of the company or for each customer renting a boat.

Seen from the park side, there will be a table of users with capacity to access the table of boats, table of skippers, and the table with the 'orders' linking them.

This table is the one that will be used to generate the daily listing to show the expected boats for each day, and having also the relevant information of the skipper for legal purposes.

The essential information to be collected about the boat and skipper is presented in the next table:

	BOAT		SKIPPER¹⁹
	Boat Code		Skipper Code
	Boat Name		Skipper Name
	Boat flag		ID/Passport Number
	Boat Plate number	o	expiry
	Boat length		Scan of ID/Passport Number (uploaded in pdf or jpg)
	Owner name or charter company name		Scan of Skipper's License (uploaded in pdf or jpg)
	Address		Address
	Telephone		Country
	Email		Telephone
	Scan of Navigation License (uploaded in pdf or jpg)		Email
o²⁰	expiry		Wish to be updated of news/daily weather forecast news while being in the park y/n?
	Scan of insurance receipt (uploaded in pdf or jpg)		Let us follow you on Instagram (id?)
o	expiry		Let us follow you on Tweeter (id?)
	Scan of Vignette (uploaded in pdf or jpg, foreign boats only)		Let us follow you on Facebook (id?)
o	expiry		Let us follow you on Pinterest (id?)
	Scan of certificate of installation of mandatory antipollution devices installed²¹ (uploaded in pdf or jpg)		

Table: Essential information to be collected about the boat and skipper

PERMIT ISSUING

The basic structure for applying for a permit²² is presented below.

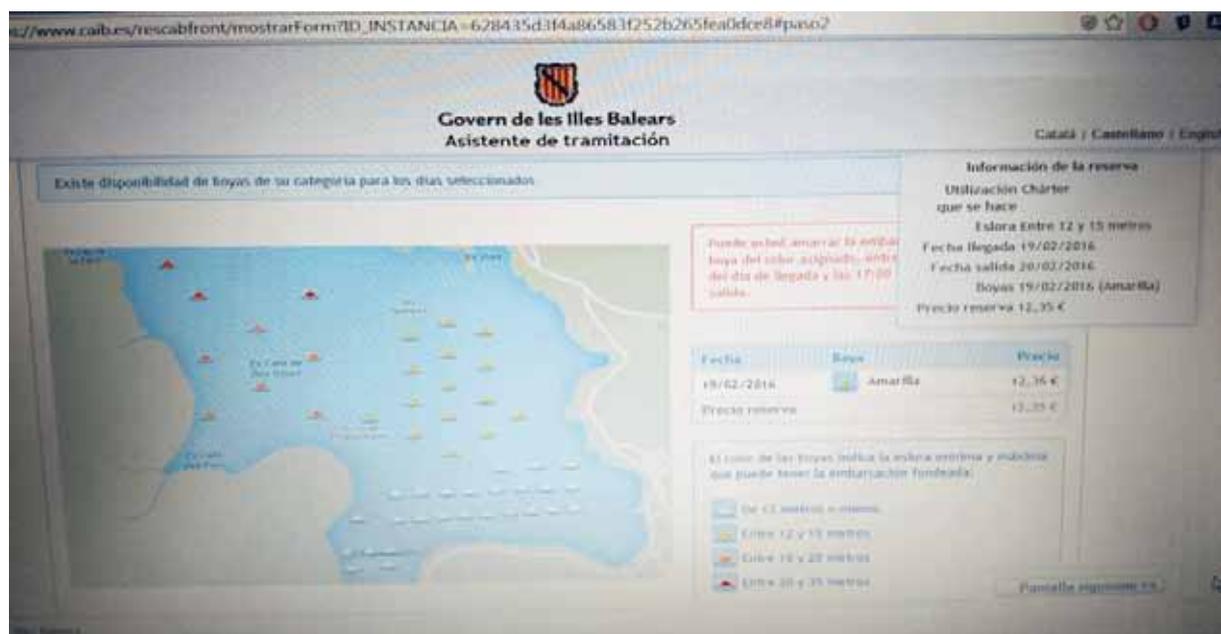
A registered user will now be able to apply for a permit for a number of days, so the applicant has to supply all the fields in the Table below except those marked with *, that are set by the system.

*	Permit Code	
	Boat Code (picked from the boats database)	
	Skipper Code (picked from the skippers database)	
	Date of Arrival	
	Number of nights stay	
	Charter or Private²³	
*	number of persons on board (calculated by adding cells below)	
	national code 1	number of people

	national code N	number of people
	mooring area code	
	buoy number	
*	date : time when the reservation was made	
*	payment transaction code	

Table: Data necessary for applying for a permit

On some websites the users can see the map of the area and select the buoy they want²⁴. An example of such website is shown below.



Screenshot of the permit issuing system of the Cabrera National Park Archipelago in the Balearic Islands.

MONITORING: TRACKING WHAT BOATS DO

Ideally, when the system is set, the visitors should be able to leave their buoy to go for a pleasant sailing around different coves of Lastovo, without fear of finding their buoy occupied at their return.

Also, it will be good to allow changing, as many times as they want to, from their reserved buoy to a free buoy, or to a mooring in a marina or a konoba. This can be made possible by making a request for a free buoy and confirmation using the reservation system through their cellular/mobile internet, or at the internet access point (local Wi-Fi provided by bars, konobas...). An automatic confirmation message via WhatsApp or email to the visitor account would serve as a permission to use the new location. A small change fee, which is suggested not to be more than 5 EUR, would be conceivable. In this self-operated system the skippers move from

one point to the other with the certainty of having a buoy at the destination spot, and, at the same time, leaving a track of the movements that can be used to study the preferences.

This will be an improvement because, in fact, when rangers now go from one cove to the next one, they do not have any idea about what boats they will find there, because boats are allowed to change their mooring freely from side to side as far as they have a valid entrance ticket for the day.

This results in rangers having to check through the registers to see if the boat has permission (if it purchased the entrance ticket)²⁵.

If the data is properly updated, the rangers can have a daily printout of the boats that are in the Park before going out to the field with the basic information.

The daily listing should include at least the information listed below:

c	Note
INFORMATION PROVIDED BY THE DATABASE	
Boat name	
Length	
Flag	
Area code	
Assigned Buoy number	The Park can assign buoys, but it is possible that the skippers go to moorings in marinas or <i>konobas</i>.
Arrival day and Departure day	As a reference (the listing is for the 'present day')
Number of persons and nationalities of crew	To be checked by the rangers, because the amount paid as daily tax includes two concepts, boat and persons per day²⁶.
Charter-Private	
INFORMATION COLLECTED IN THE FIELD	
Found in Area Code...	It is very likely that, unless Park is very strict, skippers change buoy/ mooring, even several times a day, especially if there are free buoys in the Park. Registering the spot where a boat has been observed serves for the monitoring purposes.
Buoy/Mooring/Anchor	Anchor, in case there are areas without <i>Posidonia oceanica</i> where anchoring is allowed.

Table: Necessary daily listing of boats for rangers

KEY FINDINGS

This document is pointing you to some of the key findings of 2012 and 2015 studies. In this closing chapter we resume some of the most relevant lessons from these studies.

Arrive, understand and then rule

The arrival of a 'new' authority to a coastal area, where many stakeholders have been developing their activities and dreaming their future is usually feared and the implementation of its management rules discussed angrily if not properly taken and communicated.

In a small community like Lastovo, the setup of a Park needs absolutely the compliance of the people to flourish and reach the conservation objectives, that need to be understood and shared by the local community. We used a process of participation using a tailored interview with open questions. But it was also the moment to give information of what was going on. We are pretty satisfied by the results because it allowed an easy access to many aspects related with the future management of the nautical tourism in the Park. We do our interpretation, but the base data is there and can be revisited or reinterpreted in case of willing.

Collect data and communicate with users

Proper collection of data gives to the MPA managers elements to base proper decisions that are consistent with conservation objectives. Missing of designing and implementing a structured and reasoned quantitative and qualitative rationale, can end up putting the management in a difficult position when it comes to create limitations to an activity -sailing- that is used to high degree of freedom in its development.

The collection of a fee or the concession of a permit to the visitors is a costly process, that can be more or less time and resource consuming depending on the chosen solution. In this document we resume the advantages of collecting information about the sailing boats in a platform that could be operated by the users or other social agents related with them (marinas, professional crew, konobas...) . As a 'natural' consequence of the creation of this database, the setup of a 'social network' of all sailors visiting the Park is encouraged, as a two way communication channel with the users.

Rationalising investment by managing the demand

When you know in detail the flows of the demand, you can plan the deployment of the infrastructure to serve this demand. We describe how, when there are a few peaks of intense demand, you can decide to limit the number of buoys and/or moorings to a number (and thus, an economic cost) that is in the scope of your budget of installation and yearly maintenance.

Reaccomodating the excess of the demand in non-peak days provides benefits; apart from reduced environmental impact, it redistributes the demand, filling 'low demand days'. If incentives are set to move the demand (higher prices for peak days, full week special fees etc.) the objective of educating the demand can be easily reached.

Getting social and ecological benefits from passing sailing tourists and voyagers

The establishment of a communication channel with the users provides many opportunities to go beyond the usual compartmented approach (MPA managers only looking at their 'business').

The permit/fees collection is a good moment to deliver information about events happening in the islands that stakeholders would like to communicate. Visitors would like to know about the possibility of having a taxi ride, renting a vehicle, visiting monuments or exhibitions, attending music concerts, festivals or even the benefits for the environment of using Marina or Konoba mooring land services (laundry or showers connected to land facilities to process sewage water). Park can help in increasing the expenditures of visitors for land services, so providing benefits to a wide number of Lastovo inhabitants and building compliance links.

ENDNOTES

- ¹ http://www.sunce-st.org/eko.php?category=projekti&blob_id=683&lang=hr
- ² Many boats are sitting unused in their moorings more than 95% of the year, so initiatives of boat renting and boat sharing are becoming more and more popular. This allows the optimisation of the use of the scarce good 'mooring' and the expensive capital good 'boat'.
- ³ Nature Park Lastovo Islands Visitors Study (2011).
- ⁴ <http://www.mppi.hr/UserDocsImages/Strategija%20razvoja%20nautickog%20turizma%20ENGL%201.pdf>
- ⁵ A recent decree from Jul 2012 http://narodne-novine.nn.hr/clanci/sluzbeni/2012_07_80_1875.html <http://anchoragesincroatia.blogspot.com.es/2012/10/law-modified-no-anchoring-near.html>
- ⁶ For the full text of the questionnaire and the list of interviewees please refer to the Annex.
- ⁷ The boats having Ubli as a closer spot for entering Croatia are not always staying on Lastovo, and are just a fraction of those visiting the island.
- ⁸ In this case it is significant that the 3 people who declined to respond to the question were all directly related to nautical tourism.
- ⁹ Those interested can read many particular opinions in the 2012 study, showing a healthy participatory position of many interviewed.
- ¹⁰ There is a concern about this model of evening collection of the fee, which makes it difficult to charge excursion boats that jump in Lastovo for a couple of hours in places like Mihajlo. There is a problem for rangers to organize themselves to reach these spots.
- ¹¹ 2012 data was nearly exhaustive. There were only 2 days between 1 June and 30 September when for operative reasons it was not possible to get counting done and an estimation was made for these days based on the data of the previous and the next days.
- ¹² Estimated around 40%.
- ¹³ 1 meter = 3ft.
- ¹⁴ 18-38 ft = 5,5-12 m; 39-42 ft = 12-13 m; 43-48 ft = 13-15; 49-240 ft = 15-73 m.
- ¹⁵ Nautical Tourism Development Strategy of the Republic of Croatia 2009 – 2019.
- ¹⁶ Uncontrolled, Unrestricted and Undirected see chapter 5.1 of the 2012 study.
- ¹⁷ Official Gazette no. 80/2013.
- ¹⁸ The usual mechanisms under the EU directives scrutiny include providing information to the users about the fact that the collected data will be part of a Park owned database to be used ONLY for managing purposes. It is important to assure that Croatian Law standards are fulfilled.
- ¹⁹ The information about the skipper is not relevant in terms of statistics. The nationality of the crew is registered in the payments table in the database.
- ²⁰ The expiry date is not suitable to be accessed by the users, but by the Park database operator. A process to check the uploaded documents is needed, and also an email can be sent automatically to the boat owner asking them to upload the new document in the Park files.

²¹ Relevant if having these devices installed results in advantages for lower fees or longer stay, or if not having them can result in the denial of authorisation. This is difficult to enforce, because the right installation of septic tanks is complicated to inspect, especially in privately owned passing by boats. For big boats (>20m), touristic day-trip boats and charter boats from companies based in the area? It should be easy to get a certificate of installation, and it is interesting to start a process of 'boat registering' so registered compliant boats have some discount or preference in the issuing of the permits.

²² In many MPAs application for a permit is necessary. At the moment of writing these lines, in Lastovo it is not mandatory to get a permit but paying a daily fee per person. In this document we use the 'permit' term as synonymous of 'receipt', that goes associated to the release of some basic information of the boat, owner and visitors, and to the issuing of a receipt of the payment.

²³ The same boat, depending on the flag, can be used as private or charter in different moments. The record pretends collecting this info at a permit level instead of assuming it in the boats table.

²⁴ This system, similar to the theatre and cinemas reservation programs, can be seen in the Cabrera National Park Archipelago in the Balearic Islands. <https://goo.gl/IUHKhc>.

²⁵ If the rangers are not provided with daily updated lists of the boats with valid permits for the day, there is a time consuming approach to the boats to ask the crew to show the permit for the day. Sometimes the crew is sleeping or absent, so the process needs a second visit or eventually a failure in the control. Showing that the rangers do not have a piece of information that is key for their job gives a bad image of the Park management organisation. If the rangers have the right listings, they can pass by the boat and register only the code of the location where it is anchored/moored.

²⁶ This is in the case that the Park decides for the option of charging entrance fees based on both boat size and number of people.

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