



The identification of critical habitats and the analysis of the management procedures for the future Lošinj–Cres marine protected area

EXECUTIVE SUMMARY

Peter Mackelworth, Caterina Fortuna, Draško Holcer, Annika Wiemann, Luca Giannoni and Bojan Lazar



Blue World Institute of Marine Research and Conservation
Kaštel 24, HR-51551 Veli Lošinj, Croatia
www.blue-world.org

Veli Lošinj, 10th December 2003.

Report prepared for the Ministry of the Environment & Physical Planning, under the contract Klasa 112-04/02-01/134, Ur.br. 531-06/1-02-1

INTRODUCTION

This summary is based on information presented in the Interim (January 2003) and final (December 2003) reports. Included within, is a summary of the findings of the two reports, with emphasis on current best practise management techniques, suggestions for viable pragmatic boundaries; and finally recommendations for the development of the Lošinj Dolphin Reserve. This executive summary further identifies areas of uncertainty and suggests means to reduce that uncertainty.

There are certain conservation actions that should be carried out without delay according to the principles of precaution as recommended by international legislation and agreements signed by the Croatian parliament, in particular the formation of a local management authority and the instigation of measures for habitat protection. The establishment of the protected area in the area of Lošinj and Cres would benefit both direct conservation of the unique resident bottlenose dolphin community and help create an ecological network in the Adriatic sea according to the priorities of the Bonn, Berne and Barcelona conventions and the Agreement for the Conservation of the Cetaceans of the Black sea, Mediterranean sea and the contiguous Atlantic area (ACCOBAMS).

1. IDENTIFICATION OF CRITICAL FACTORS

1.1 Dolphins

In order to define the possible impact - either negative or positive - on dolphin distribution in the area, seven parameters were analysed. Such analysis allowed us:

- To clarify which, among the chosen factors, affect dolphin ecology;
- Hypothesise the origin of the uncertainty of the proposed models;
- Subsequently inform on the real meaning and consequences of the proposed MPA boundaries.

1.1.1 Natural Parameters

Three physiographic variables and one geographic variable were analysed: depth; bottom variability; slope; and distance from the nearest coast. Of these variables depth was found to be highly significant; and slope was found to be significant. This indicates that areas of greater depth and low slope seem to be attractive to dolphins. To understand the reasons why these parameters have such a high impact we should look into our knowledge of bottlenose dolphin ecology in the region. Bottlenose dolphin distribution is believed to be directly affected by the presence of its major prey species, such as hake in this region. During the eight year (1995-2003) monitoring period, depth decreasingly affected dolphin distribution, possibly indicating local changes in demersal fish stock or a growing impact of other factors linked to various anthropogenic activities.

1.1.2 Anthropogenic Parameters

Three anthropogenic factors were analysed: distance from marine petrol stations; distance from the Mali Lošinj - Rab 'highway' through Privlaka bridge; and known trawling areas. The distances from three main marine petrol stations and from the ML-Rab 'highway' were found to be significant and have a negative impact on the dolphins' distribution. Trawling areas were found to be highly significant, positively attracting bottlenose dolphins. During the whole research period (1995-2003), the factor "distance from the ML-Rab 'highway' " was found to increasingly impact dolphin distribution, denoting a strong negative trend due to the increase in the number of passing recreational boats. Years 2001, 2002, and 2003 showed the strongest avoidance of this area by dolphins, consistent with the increasing tourism. Results showed that there was an attraction to trawling areas; this may be attributed, not only to a documented exploitation by the bottlenose dolphins of the bottom trawling activity, but especially to the overlapping of the target species, for example hake, that both the dolphins and the bottom trawling fishery exploit. It should be concluded that although trawling is positive attracting factor in this analysis, the long-term conservation aspect could well indicate negative impacts on the habitat and dolphin population.

1.2 Fishery

Fishery catch has been in decline and has been recognised as such. This not only affects the protected species here but

also the viability for the fishery. This has been recognised by the fishery guilds of the region; 'it is absolutely clear that if we overfish, there will be no more fish to catch. We are afraid that this has already happened, and that the famous five minutes to midnight has long ago passed... Furthermore, it is essential to abolish the possibility of expanding any kind of sea fishing, as this possibility nullifies all our efforts to decrease the rush of all kind of fishing industries.'

1.3 Sea Turtles

This region hosts critical marine habitats for the loggerhead sea turtle (*Caretta caretta*) belonging to the Ionian-Adriatic management sub-unit. Results of spatio-temporal analyses have shown that this species resides in Lošinj-Cres Archipelago on a year-round basis. These waters host summer foraging as well as over-wintering habitats shared by juvenile and adult loggerheads, mostly belonging to the Greek nesting stock. High levels of loggerhead's by-catch incidents in trawls are reported by local fishermen (10-100 turtles/trawl/year), particularly in the winter months; interactions with other fishing gears are not yet quantified. Mediterranean loggerhead population is classified as endangered, and listed under Appendix 2 of the Bern and Barcelona Conventions. Two other sea turtle species are recorded in the region, both being classified as critically endangered in the Mediterranean: the green turtle (*Chelonia mydas*) and the leatherback turtle (*Dermochelys coriacea*). Both species are also listed under Appendix 2 of the Bern and Barcelona Conventions.

1.4 Benthic

Throughout the main proposed marine protected reserve large areas of *Posidonia oceanica* with its associated marine life can be found as yet have unmapped. There are also areas with a highly developed coral community dominated by calcified algae, corals, mosses and sponges. Northern Adriatic facies of *Paramuricea clavata* are only known to be in 2-3 locations in the Kvarner bay. These corals only grow in areas of good water clarity with low suspended solid loading. Coral species that can be found here include, *Paramuricea chamaelon*, *Corallium rubrum* other species such as *Palinurus elephas*, *Lithophaga lithophaga*, *Pholas dactylus* are also found here. *Paramuricea chameleon*, *Lithophaga lithophaga*, *Pholas dactylus* are protected under appendix II, Bern Convention; *Posidonia oceanica*, *Pholas dactylus*, *Lithophaga lithophaga* are protected under appendix II Barcelona Convention; *Corallium rubrum* and *Palinurus elephas* are protected under appendix III of the Barcelona Convention. Natural History Museum in Rijeka has proposed the islands of Veli Ćutin and Mali Ćutin, based on a preliminary study on the biological importance of the seabed to be included in the physical plan of the County of Primorje and Gorski kotar as a protected area. There is a suggestion that this area could be included in a larger protected area: 'due to the numerous proposed natural sites within the wider region of Cres-Lošinj archipelago the option of inclusion of the islands within the larger protected area by using of zoning as a tool in setting the appropriate protection regime must be seriously considered' .

1.5 Birds

Currently 185 species of birds, all of which are protected under Croatian law, have been identified on the Cres-Lošinj archipelago. This is the highest number recorded for any of the Adriatic islands. Many of the smaller uninhabited islands in the area, that are currently undisturbed, are particularly important for nesting and brooding shags (*Phalacrocorax aristotelis desmaresti*) the Mediterranean shearwater (*Calonectris diomedea*), the yellow legged-gull (*Larus cachinnans*) and the pallid swift (*Apus pallidus*). *Phalacrocorax aristotelis*, *Apus pallidus* are protected under appendix II, Bern Convention; *Phalacrocorax aristotelis* is protected under appendix II of the Barcelona Convention.

1.6 Archeological

This area was an important trading route, between Greece and Venice in particular, and it is believed that a large number of important wrecks remain undiscovered. In 1999, a statue of 'Apoksimenos' - a Greek athlete scraping himself after competition was discovered near the island of Orjule. It is believed to be one of only six Greek originals discovered in the Mediterranean region. The 'Apoksimenos' site is protected under the World Cultural and Natural Heritage Convention, and also encompassed by the proposed reserve.

2 AREAS OF UNCERTAINTY & AREAS OF FUTURE RESEARCH

2.1 Dolphins

1. Home range identification of the Lošinj population segment, together with links with other segments of the Adriatic meta-population through:
 - a. Comparison of ADP matching catalogue with other catalogues from Kornati, Istria, Trieste and Slovenia.
 - b. Analysis of genetic differentiation within the Mediterranean and Adriatic Seas.
2. The effects of recreational boat traffic (physical and acoustic disturbance) and dolphin watching activities (disturbance and code of conduct).
3. Anthropogenic Noise (monitoring of acoustic pollution all year-round).
4. Local pollution linked with tourism (sewage).
5. Comparative analysis of dolphin prey (stomach contents) with commercial fish stocks.

2.2 Fishery & Fish Biology

1. Collection of fishery statistics and data on fishing gear and fishing area (mapping).
2. Cooperative work with the fishing guild, identification of important fishery grounds.
3. Fish biology:
 - a. Identification of specific biology of target species of interest for small scale fishery (e.g. hake), through the analysis of catch and scientific hauls.
 - b. Data collection on local sea currents.

2.3 Sea Turtles

1. Identification and mapping of critical habitats and study of behaviour and habitat utilization through remote sensing.
2. Assessment of population size and abundance by capture-recapture study, and aerial surveys.
3. Analysis of fishery by-catch by on-board observers.
4. Experimental introduction and assessment of the Turtle Excluder Device in bottom trawls in order to reduce by-catch mortality.

2.4 Benthic & Archaeological

1. Cooperative mapping work with dive operators.
2. Mapping of the biocenoses with side scan sonar.

3 MANAGEMENT RECOMMENDATIONS

The first step is to involve the stakeholders such as fishermen, tourist agencies, divers, local people, and non governmental organisations in partnership with the relevant authorities of the city government, county authorities and national ministries in the construction of specialist working groups identifying the stresses that may be affecting the area. There is no vocal dissent regarding the current proposal, however further negotiations with the stakeholders and relevant authorities is required.

3.1 Formation of a co-management board

A new institution consisting of stakeholders and relevant authorities, including representatives from fishing organisations, tourist bodies and local authorities must be established. This would allow the collection of data from all sources for addition to the protected area and the subsequent assimilation of this data into management procedures for appropriate governance. Based on the Law on Nature Protection (2003) such a body can be created within or as part of the advisory body to the public institution that will manage the protected area. Creation of a local nature protection public institution would greatly improve the image of protected area among the local inhabitants. It has been seen in many other situation that the support of the local population is essential for the successful management of protected areas.

3.2 Enforcement

Rules and regulations must be transparent and simple. However, monitoring and enforcement of these rules are paramount to the success of the protected area. A statutory monitoring/enforcement authority should be established answering directly to the public institution. One possibility may be to have professional rangers supported by the pro bono civil service/national service scheme. Cooperation with the local fishermen and organisations using the area is also essential. The availability of information to all users of the area is essential to increase awareness of the potential for the area and to reduce enforcement costs.

3.3 Funding

Basic funding for initial creation of the public institution and protected area should come from the local, county and state authorities. External funding is necessary for the advancement and management of the established protected area. In most cases LIFE funding has been forthcoming from the European Union and this has been the case for the Moray Firth cSAC and Cardigan Bay cSAC. Hence it is recommended that LIFE 3rd Countries funding is sought. There are other sources of funding that may be investigated, ranging from the commercial sponsorship to international institutional funding or the issuance of licenses and the collection of protected area usage fees.

4 REGULATORY RECOMMENDATIONS

Below are some possible recommendations based on the activities being currently undertaken in the proposed protected area. It should be possible to adapt, alter and introduce the rules and regulations according to proposed changes in the use of the area over time. These recommendations have been taken from the research of the Adriatic Dolphin Project, others from suggestions, particularly from the fishing guild and others are examples taken from the analogous cases studies.

4.1 Fishery

- Registration of all current commercial and recreational fishermen using the area;
- Closure of the area to all commercial fishing vessels apart from those registered in Mali Lošinj and that are using the area on designation or have a historical use of the area;
- Enforcement of the current sport fishing laws regarding fishing gear, distance from the coast that tackle may be used and limitation of sale of catch by sport-fishermen;
- Closure of certain areas during spawning periods of fish species with the potential for permanently closed areas to act as supply areas for the whole area;
- Zoning of areas recognised as important as critical habitats for protected species.

4.2 Tourism

- Registration of all tourist boats using the area, including all temporary tourist boats;
- Statutory speed limit for all tourist boats;
- Statutory code of conduct around groups of dolphins for tour operators and tourist boats;
- Introduction of fixed mooring points and/or prohibition of anchoring around areas with sensitive and protected species/habitats;
- Closure of areas known to host protected bird species during breeding;
- Zoning of areas recognised as important as critical habitats for protected species.

4.3 Dive Tourism

- Registration of all current diving organisations using the area, with a statutory code of conduct for both dive operators and divers;
- Regulation of diving activities within the area with special emphasis on particular behaviour of divers near important or sensitive undersea sites;
- Closure of areas of archaeological important or areas of biological importance or vulnerable to disturbance;
- Zoning of areas recognised as important as critical habitats for protected species.

4.4 Commercial Shipping

- Commercial shipping lanes should not cross the area;
- Ferry lines should not extend beyond what is currently in place.

4.5 Extractive Industries

- The capacity of extractive industry should not extend beyond what is currently in place.

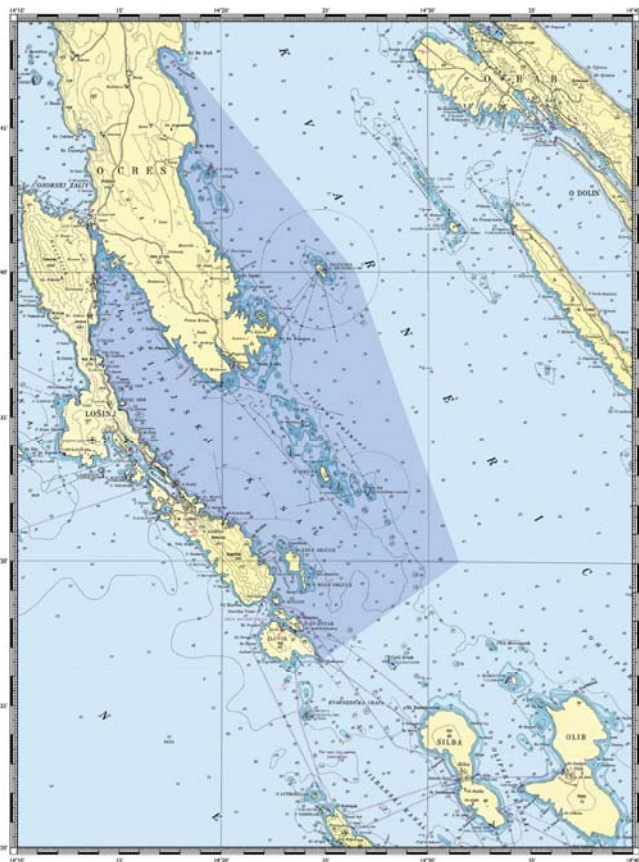
4.6 Fish Farming

- The capacity of fish farming should not extend beyond what is currently in place.

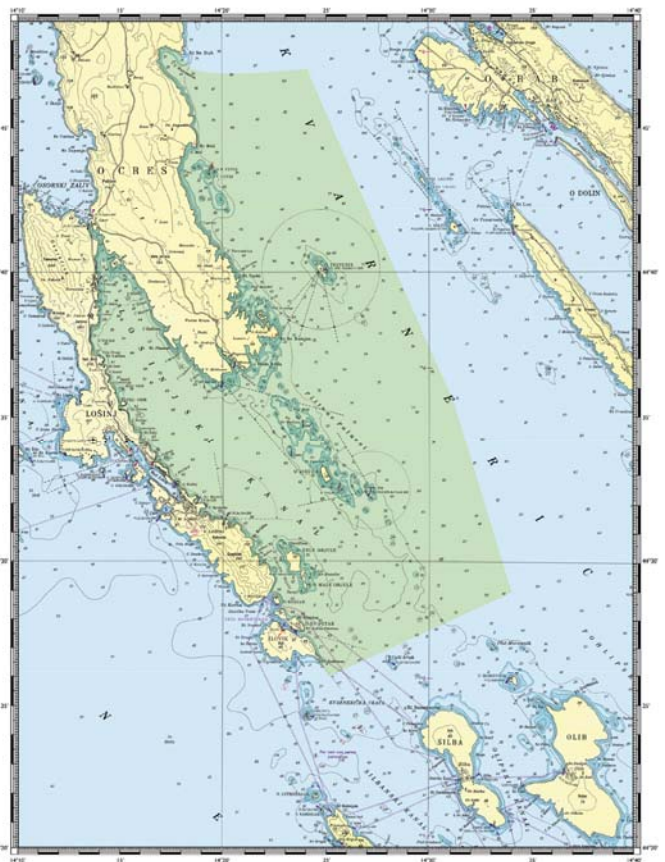
5 DESIGNATION BOUNDARIES

The boundaries presented in the Proposal for the establishment of Lošinj Dolphin Reserve (Map 1) were proposed based on the research undertaken by the ADP. The boundaries were set mostly based on the current knowledge of distribution of bottlenose dolphins within the study area (see map of sightings).

The boundaries presented in Map 2 are based on the eastern jurisdictional boundaries of the City of Mali Lošinj and include identified critical habitats for bottlenose dolphins within the study area. They are presented as a pragmatic solution to the definition of clear defined boundaries with which the proposed management institution can work.



Map 1. Original proposed reserve boundaries



Map 2. Proposed reserve boundaries matching jurisdictional limits of the City of Mali Lošinj

6 RECOMMENDATIONS FOR CREATION OF LOŠINJ DOLPHIN RESERVE

Based on the review of the current nature and species protection legislation, primarily the Law on Nature Protection (2003), we propose the creation of a marine protected area with status of special zoological reserve (in the sea). At present we suggest that there are two options that could be followed in designation

Option 1.

Designation of Lošinj Dolphin Reserve based on current scientific information

The Lošinj Dolphin Reserve can be designated using the information presented above and in the interim and final reports, upon which this summary is based. Designation should follow Map 2, allowing for the Mali Lošinj jurisdictional boundaries, forming a pragmatic designation with the seat of management established on the island.

This designation should be viewed as following the precautionary principle of setting up the current suggested area with a possibility to expand in the future based on negotiations with stakeholders, relevant authorities and further scientific work. Designation would allow for the protected area to be debated in the public arena and come into effect as soon as consensus is achieved. Furthermore this would fulfil many of the European policies for cooperative management within the field of environmental protection.

Option 2.

Delaying designation for further scientific information regarding the home range of the 'Lošinj' dolphins.

Currently the scientific information regarding the complete home range of the 'Lošinj' dolphins is incomplete. Delaying the designation would allow for further research to be undertaken, however, the period of time and expense required to finish the research may be prohibitive for the current research institution. Delaying designation may lead to further degradation of the area eroding the objectives for protection and hence falling foul of the precautionary principle.

Delaying the designation would also allow for further negotiations between stakeholders and relevant authorities. As the science would inevitably require a larger protected area probably entering into the jurisdiction of other communities such as Krk, Rab and Pag, and hence the county area of Zadar.

THE BLUE WORLD INSTITUTE OF MARINE RESEARCH AND CONSERVATION FAVOURS OPTION 1.