

The Lošinj Dolphin Reserve

Kvarnerić, Northern Adriatic

Proposal for creation of
A Special Zoological Reserve



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The Lošinj Dolphin Reserve

Summary

This proposal sets out the benefits for establishing a marine reserve at Cres-Lošinj, a recognised feeding area of the bottlenose dolphin, the only cetacean species known to inhabit Croatian national waters. The proposal validates arguments for selecting Cres-Lošinj for the purpose of marine conservation, given the present well-documented knowledge about the area and the ranges and identities of the cetacean population. This area would supplement current national regulations protecting cetaceans from harassment and provide the prototype for other such areas in Croatian national waters.

Specifically the choice of the Lošinj-Cres area for the marine reserve is due to the need to rehabilitate the marine ecosystem, which has been severely damaged by human exploitation, and it is the only documented area in Croatia with a resident dolphin community. This proposal integrates with current international actions towards the protection of the entire Mediterranean region. Given the special circumstances of this region and the vigour with which environmental protection and conservation measures are being developed by the international community, the Cres-Lošinj area offers Croatia, as an emergent nation of the Mediterranean, the best prospects for securing a satisfactory habitat for cetaceans, and other marine life, long term in the Croatian Adriatic.

Proposal for creation of A Special Zoological Reserve

Introduction

It is proposed that the County of Primorsko-Goranska designate the waters East of the Cres-Lošinj archipelago as a marine reserve for the protection of cetaceans, (Annex I) in accordance with the law for Nature Protection (1994), (Official Gazette No. 30/94), with the establishment of a 'Special Zoological Reserve'. This status will allow for the protection of the area due to the presence of one or more protected species which are acknowledged as under threat, thus prohibiting actions that may cause disruption to those species for whom the reserve is designated.

The primary purpose of this proposal is to contribute to the rehabilitation of the Cres-Lošinj marine environment, by complementing and reinforcing other measures for the conservation of cetaceans, in particular for the resident bottlenose dolphin population known to frequent this area for feeding purposes.

The present proposal is intended to supplement rather than supplant existing regulations on fishing and development in the area. It is generally accepted that a number of complementary measures maybe necessary to address different though related aspects of environmental problems. A marine reserve would focus on the comprehensive restoration of the complex interspecies associations and species-habitat associations. This area is not only important for the resident bottlenose dolphin community but also for the submarine life; historical artefacts; bird nesting sites and it is also believed to be an over-wintering ground for marine turtles (Annex II).

Characteristics & choice of an appropriate marine reserve

A 'Special Zoological Reserve' is described as; *'an area in which one or more unchanged natural parts is specially significant, and of special scientific meaning'*; and within its boundaries *'actions that could endanger the reasons why it was proclaimed reserve are prohibited'* (Article 7, Official Gazette No. 30/94).

The establishment of a 'Special Zoological Reserve' must be declared by the county assembly; *'the measures for the protection of protected natural areas shall be determined by the county authorities'* (Article 29, Official Gazette No. 30/94). Prior to this declaration approval must be given by the Ministry of Environment, Protection & Physical Planning (Article 13, Official Gazette No. 30/94). Thus this proposal supports the

adoption of physical plans regulating the measures for the protection, management, promotion and use of a specifically protected area falling within the competence of the county and municipal assembly.

The primary objective of the marine reserve will be the restoration and maintenance of the population of bottlenose dolphins in the Kvarnerić at a viable^e level. Additionally this proposal seeks to ensure that the Kvarnerić provides the environmental and ecological processes necessary for the achievement of this primary objective, subject to natural change.

This will be the first Croatian marine reserve dedicated to the protection of cetaceans hence it will fulfil many of the intentions expressed in the National Strategy and Action Plans for the conservation of biodiversity (1999):

- Development of protected areas for protected species;
- Protected areas for all species of dolphins;
- Estimation of the size, population trend and protection of dolphins, through the use of a pilot marine park.

'Particular emphasis will be placed on the protection of species listed as endangered on a global, European or national scale'

Further considerations regarding the selection of the Cres-Lošinj marine reserve

Currently Cres-Lošinj is the only documented feeding and nursery area in Croatia (Bearzi *et al.* 1992, Holcer & Fortuna 2000), however there is dearth of basic information on breeding areas of this population. In general it is not known whether breeding grounds are localised or extensive and there are suggestions that there may be genetic flow between populations within the Adriatic sea (Natoli & Hoelzel 2000). This may necessitate a more complex and progressive approach to protection, as far as breeding areas are concerned. It may also imply that national legislation will become more important in protecting these areas.

In June 2000, the Croatian parliament ratified many of the international environmental agreements, thereby bringing into force the procedures for the implementation of marine protected areas (Annex III). Many of the commitments that the Croatian Parliament has made by ratifying these treaties, in particular the Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS), and Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean, Barcelona (1976) and the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean, Barcelona (1995), can be met through the designation of the proposed area (Mackelworth *et al.* 2001).

ACCOBAMS states (Article 2); *'parties shall cooperate to create and maintain a network of specially protected areas to conserve cetaceans'; 'parties shall endeavour to establish and manage specially protected, corresponding to areas which serve as habitats or feeding areas'; and 'specially protected areas should be established under the Barcelona convention (1976), or its relevant protocol or within the framework of other appropriate instruments'.*

The boundaries of the Cres-Lošinj marine reserve

Although bottlenose dolphins are highly mobile, they have tight 'home ranges' on feeding grounds. The Cres-Lošinj population is known to consistently use the proposed area for feeding (Annex I) hence the preliminary boundaries for the reserve are based on the 15 years research carried out by the Adriatic Dolphin Project (Bearzi *et al.* 1992; 1999). There is no other area in Croatian waters with evidence of long-term use by a resident population of dolphins (Notarbartolo di Sciarra & Bearzi 1993).

¹ Viable Population is defined as; A secure and enduring population that is able to sustain itself in the long term. This is dictated by minimum and maximum breeding age, adult and calf survival rate and annual birth rate (SNH 1999)

There is a need for more extensive research in the contiguous areas to the proposed marine reserve to ascertain 'home range' and clarify the optimal boundaries for the reserve to fulfil its objectives. There should be the potential to expand or reduce the preliminary boundaries based on the results of further research work (Fortuna *et al.* 2000).

Other supportive and supplementary activities

This proposal for protected status not only fulfils Croatian obligations to ACCOBAMS but will also help to protect other essential and important habitats for other species important in the Mediterranean. For this reason this area could also be recommended as a Specially Protected Area of Mediterranean Importance (SPAMI), through the Regional Activity Centre, Specially Protected Areas (RAC/SPA).

Designation could also lead to inclusion into the Emerald Network of the Bern convention, thereby advancing the potential for large scale financial support through the LIFE 3rd Countries scheme of the European Union, supporting the economic and social changes that will occur in the area.

Research & monitoring

A long term monitoring programme should be set up for those species and habitats listed in Annex II coordinated by the specialist groups and the competent authority, being the county authorities, supported and sponsored by the relevant national ministries. Research should start immediately to provide a baseline for the subsequent analysis of the effectiveness of the marine reserve.

Duration of the marine reserve

The duration of the reserve will be declared by the competent authority, being the county authorities, generally; *'the reserve will exist for as long as there is a need under which it was established or until the reason for establishment become extinct'*. It is suggested that the reserve should be established for an indefinite period of time; with periodical reviews every five to ten years.

Recommendations

- Time is required for further and more extensive research, however in the mean time a precautionary approach should be maintained;
- Emphasis should also be given into the study of the problems facing the dolphin community, in particular, dolphin-fishery interaction, dolphin-tourism interaction and localised pollution effects including noise pollution;
- Analysis of the upstream effects on the reserve, such as pollution from the industrial centres located in the Adriatic catchment area;
- Study of the socio-economic impact of the protected designation on the local community;
- Analysis of protection techniques, such as zoning, allowing more restrictions in areas of greater sensitivity.

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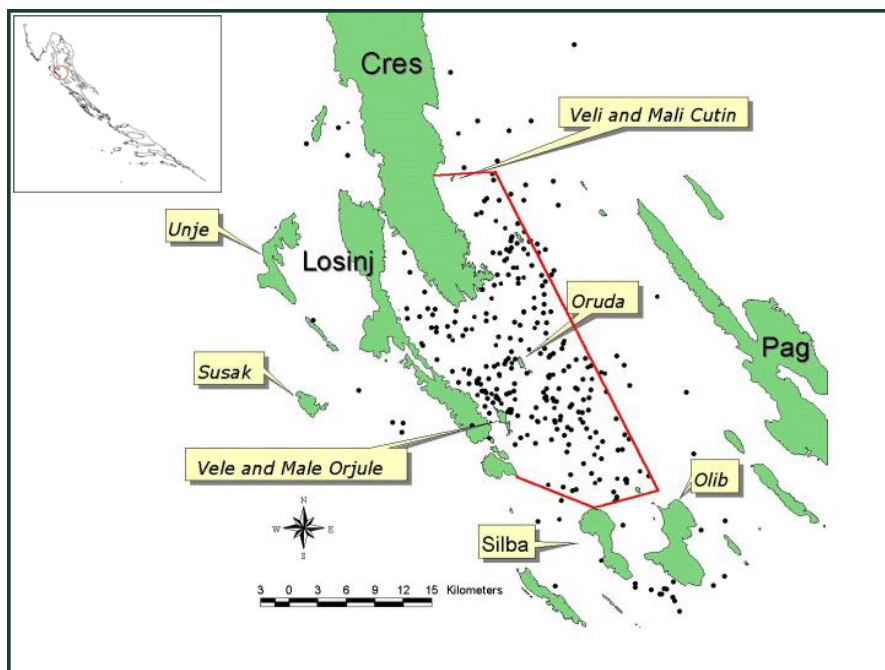
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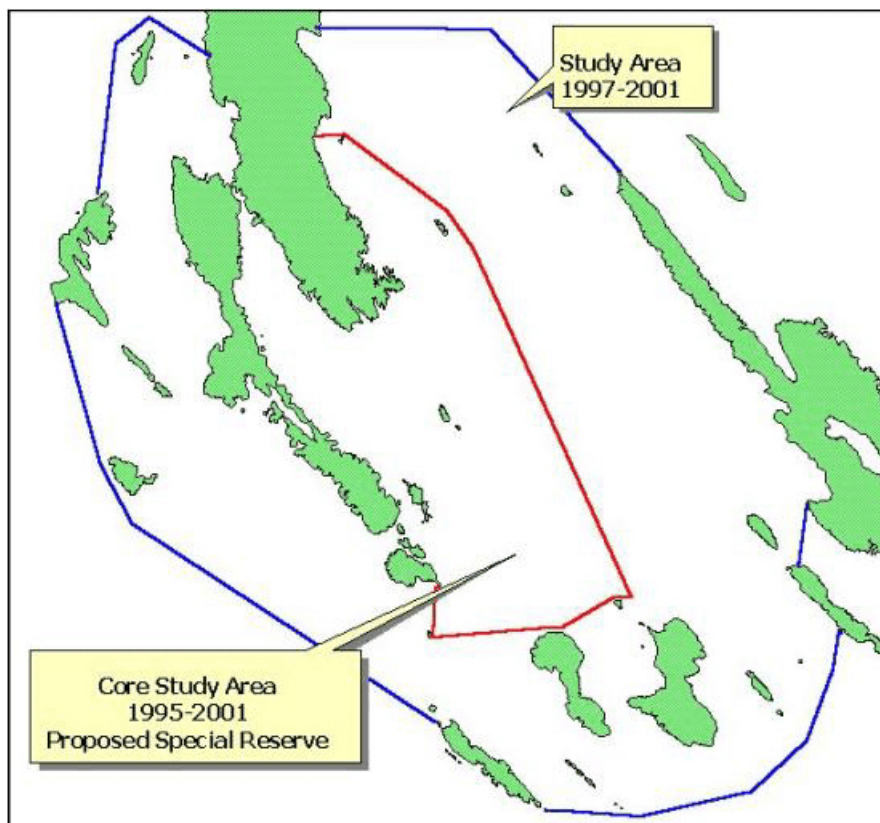
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Annex I

Map 1 – Dolphin Sightings, 1995-2001.



Map 2 – Study Area & Proposed Preliminary Dolphin Reserve Boundaries



Annex II

Environmental & Cultural Features of the Lošinj-Cres Marine Reserve

Bottlenose Dolphin (*Tursiops truncatus*).

Dolphins are top predator and a symbol of a healthy environment. The Adriatic Dolphin Project has been studying the resident bottlenose dolphin (*Tursiops truncatus*) population since 1987 and hence is one of the longest ongoing studies in the Mediterranean sea. The size of the bottlenose dolphin community is currently estimated at 113 dolphins (95% CI = 107-121, SE = 6.967) (Fortuna *et al.* 2000). This is well below the IUCN classification of an isolated population of 250 individuals as 'critically endangered'. There have been suggestions of some gene flow from other populations within the Adriatic (Natoli & Hoelzel 2000), however undoubtedly this population is at risk and requires further monitoring and protection. The rocky areas south of Cres, surrounding the islands of Trstenik, Oruda and Palacol, and the coastal area east of Lošinj are favourite sites for feeding and socialising, and are used as nursery areas by groups of females (Bearzi *et al.* 1992, 1997). This population is under threat from many sources including over-fishing, pollution and boat disturbance mainly due to tourism in the summer months. In the past the common dolphin (*Delphinus delphis*) was also often found in this area, however this species is now believed to geographically extinct. For further information please contact: Blue World, Zad Bone 11, HR-51551 Veli Lošinj, Croatia; Tel: +385 51 236 406; Fax: +385 51 520 275; Email: adp@blue-world.org; Website: www.blue-world.org

Submarine Life

Throughout the main proposed marine protected reserve there are large areas of *Posidonia spp.* with its associated marine life can be found, and as yet have not been mapped. The submarine area of the Cutin Veliki and Cutin Mali islands and their surroundings are also encompassed by the proposed scientific reserve. They are of particular interest due to the presence of many different species at shallow depths (IDC 1997; Zibrowius & Grieshaber 1975). This area has a highly developed coral community dominated by calcified algae, corals, mosses and sponges, and characterised by a great variety of coral morphologies. These corals only grow in areas of good water clarity with low suspended solid loading. In this area many rare species can be found, some of which are protected: *Paramuricea chamaelon* and *Palinurus elephas*. However the accessibility of these species places them under threat from divers. A higher grade of protection is needed here and a scientific study of the area is required. The threatened brown and white sea dates (*Lithophaga lithophaga*, *Pholas dactylus*) can also be found here, however they are being illegally extracted from the reefs which, besides causing the depletion of these slow growing mollusc, is causing widespread destruction of the substrate. For further information please contact: Ms. Antonieta Pozar Domac, Department of Zoology, Division of Biology, Faculty of Sciences, University of Zagreb, Rooseveltov trg 6, Zagreb or Ms. Milvana Arko Pijevac, Natural History Museum of Rijeka, Lorenzov prolaz 1, Rijeka.

Archaeological Importance

This area was an important trading route and it is believed that a large number of important wrecks remain undiscovered. The archaeological site at Orjule is also encompassed in the proposed marine reserve. In 1999 a statue of a Greek athlete 'Apoksimenos' scraping himself after competition was discovered by divers and is now in Zagreb, it is believed to be one of only six Greek originals discovered in the Mediterranean region. A high grade of protection is required around those sites known to contain wrecks, greater survey work is required around other areas believed to have wrecks. For further information please contact: Mr. Ferdinand Meder, Croatian Restoration Institution, Nike Grskovica 23, Zagreb or Croatian Archaeological Society, Bogoviceva 1, Zagreb.

Bird Nesting Sites

Currently 185 species of birds, all of which are protected under Croatian law, have been identified on the Lošinj-Cres archipelago (Sušić 1992 cited in IDC 1997). This is the highest number recorded for any of the Adriatic islands. Many of the smaller uninhabited islands in the area have important nesting sites that are currently undisturbed. This includes the islands of Oruda and Palacol within the suggested protected area that are particularly important for nesting shags (*Phalacrocorax aristotelis desmaresti*). Other sea birds can be also spotted, like the Mediterranean shearwater (*Calonectris diomedea*), the yellow legged-gull (*Larus cachinnans*) and the pallid swift (*Apus pallidus*). Currently insufficient research has been undertaken to give

accurate estimates around the other islands in the region. For further information please contact: Mr. Goran Sušić, Eco Center Caput Insulae, Beli bb, Beli, Croatia.

Sea Turtles

All sea turtles are protected under Croatian law. In particular the loggerhead turtle (*Caretta caretta*) is often seen in the region. It is believed that a portion of the Greek nesting population forages and over-winters here. Hibernating turtles are regularly brought up in trawling nets over the winter period (Lazar in press). Other species such as the green turtle (*Chelonia mydas*) and the leatherback turtle (*Dermochelys coriacea*) have been sighted in the region (IDC 1997). These are globally threatened species that require more study in the area. For further information please contact: Mr. Bojan Lazar, Department of Zoology, Croatian Natural History Museum, Demetrova 1, HR-10000 Zagreb, Croatia.

Annex III

Status of signature/ratification of relevant international agreements (Trošelj, & Klasić-Stanković, 2001)

The Republic of Croatia has accepted the internationally established legal framework for the nature and environmental protection by succession, setting its constitutional determinants accordingly. Conclusion and Enforcement of International Treaties of 1991, in particular to the Resolution on Enforcing Multilateral International Treaties, the Republic of Croatia has become a Party to numerous international treaties, through ratification, or notification of succession (Table 1)

Table 1- Status of signature and ratification on international legal instruments

International legal instruments	Signed	Ratified
<i>Convention on Biological Diversity (CBD)</i>	✓	✓ (1996)
<i>Convention on Wetlands of International Importance Especially as Waterfowl habitat (Ramsar Convention)</i>	✓	+ (1993)
<i>Convention Concerning the Protection of the World Cultural and Natural Heritage (Paris, 1972)</i>	✓	+ (1993)
<i>Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES) (Washington 1973)</i>	✓	+ (1999)
<i>Convention on the conservation of European wildlife and natural habitats (Bern, 1979). Amended 1996 to cover all Mediterranean Cetacean species;</i>	✓	+ (2000)
<i>Agreement on the conservation of cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic Area (ACCOBAMS) (Monaco, 1996)</i>	✓	✓ (2000)
<i>Convention on Migratory Species, (Bonn, 1979)</i>	✓	✓ (2000)
<i>Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean (Barcelona, 1976) and the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean (SPA Protocol), (Geneva, 1982).</i>	✓ ✓	+ (1993) *
<i>Agreement on the conservation of Africal-Euroasian migratory waterbirds (AEWA) (Bonn, 1996)</i>	✓	(2000)

The principal activities in the Adriatic aimed at environmental protection with international co-operation are implemented within the UNEP-MAP and its centres, all within the Barcelona Convention for the Protection of the Mediterranean Sea against Pollution (1976,1996) and the related Protocols (Table 2)

Table 2 – Status of signature and ratification of Barcelona Convention and its Protocols

Convention for the Protection of Mediterranean Sea against Pollution (Barcelona Convention)	✓	+ (1993)
- amendments to the Barcelona convention	✓	✓ (1998)
The Protocol for the Prevention of Pollution of Mediterranean Sea by Dumping from Ships and Aircrafts (Dumping Protocol)	✓	+ (1993)
-amendments to the Dumping Protocol	✓	✓ (1998)
The Protocol Concerning Co-operation in Combating Pollution of the Mediterranean Sea by Oil and Other Harmful Substances in Cases of Emergency (Emergency Protocol)	✓	+ (1993)
The Protocol for the Protection of the Mediterranean Sea against Land-based Sources and Activities (LBS Protocol)	✓	+ (1993)
- amendments to the LBS Protocol	✓	-
The Protocol Concerning Specially Protected Areas and Biological Diversity in Mediterranean (SPA Protocol)	✓	+ (1993)
Protocol concerning Specially Protected Areas & Biological Diversity (SPA Protocol)		*
The Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from Exploration of the Continental Shelf and the Seabed and its Subsoil (Offshore Protocol)	✓	*
The Protocol in the Prevention of the Pollution of the Mediterranean Sea Resulting from the Trans-boundary Movement of hazardous Wastes and their Disposal	-	-

✓ Ratified, + Taken by Succession, * In Preparation for Ratification, - Not Ratified

- All Cetaceans are protected under appendix II, Bern Convention; and appendix II of the Barcelona Convention.
- *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.
- The Apoksimenos site is protected under the World Cultural and Natural Heritage Convention.
- *Phalacrocorax aristotelis*, *Apus pallidus* are protected under appendix II, Bern Convention; *Phalacrocorax aristotelis* is protected under appendix II of the Barcelona Convention.
- All Sea Turtles are protected under appendix II, Bern Convention; and appendix II of the Barcelona Convention.