

COASTAL MANAGEMENT IN THE PROTECTED AREA OF THE BAY OF MALI STON - HISTORICAL APPROACH

UPRAVLJANJE ZAŠTIĆENIM PODRUČJEM MALOSTONSKOG ZALJEVA- POVIJESNI PRISTUP

UDK 338.24(262.3)] "Malostonski zaljev"

Conference paper

Izlaganje sa stručnog skupa

Introduction

Uvod

The Bay of Mali Ston (Fig. 1), Croatia's major shellfish cultivation area, has been in production continuously for at least the past several hundred years. Over this long history it has enjoyed the protection of the local people who depend upon its resources for their livelihood. The close relationship between the people and their bay has led to actions that have protected its environmental integrity long before it became fashionable to talk about 'sustainable development'. It currently is the only Adriatic area protected for the future.

This area was the object of media attention in 1977 when the Municipality of Dubrovnik launched a plan for the construction of hotels and other tourist facilities near the Mali Ston's shellfish cultivation fields. Owing to the coordinated efforts of the people of Ston and interested Croatian scientists, these plans were abandoned.

Another challenge—this one potentially more risky for the health of the Bay than the earlier one—was raised in 1980 when the Republic of Bosnia and Hercegovina proposed construction of an entire new city, Neum, in the vicinity. The major threat that would be posed by this sweeping construction project was the regular dumping of a heavy load of municipal sewage into the center of the Bay. Under the original proposal, the quantity of wastewater to be introduced would have altered significantly the nature of the marine ecosystem, thereby jeopardizing Ston's successful commercial shellfish industry.

Many years of often animated discussions (1980-1987) that touched not only on the pressing ecological issues, but also on the broader issues of marine affairs, management, and politics, ensued. The result of this deliberative process was favorable for the Bay and its communities: In place of the original plan, a regional sewage system, together with primary treatment facilities, was constructed. Regional wastewater now is transported, via a 23-km pipeline, to an offshore discharge outfall in the Southern Adriatic. There, it is

dispersed under conditions that insure its rapid dilution to acceptable environmental levels.

Thus, the Bay, along with its valuable mariculture industry, has been protected. At the foundation of the ecologically sound resolution to this problem was a body of applied scientific research.

Natural characteristics of the bay

Prirodne osobitosti zaljeva

The Bay of Mali Ston is a deeply intruded Miocene depression 26 km long with a surface area of 74,5 km². Its average depth is 15 m and it contains a volume of about 1,3 km³.

Bordered on the south by the Pelješac peninsula and on the north by the Croatian mainland, the Bay is connected to the open sea on its western side, between the mouth of the Neretva River and the island of Hvar. The surrounding limestone hills are covered by vegetation typically found throughout the coastal Mediterranean and known in the local dialect as *makija* (It. *macchia*, Fr. *maquis*).

Freshwater is injected into the Bay by the many springs and underground holes in the karst base that underlies the area. The resulting mixture of fresh and marine water is one of the main features of the Bay's environment. Ecological parameters vary temporally and spatially: salinity 21‰ - 38‰, temperature 10⁰-24⁰, transparency 5-12 m. As might be expected, nutrients are present at higher levels than in other parts of the Adriatic.

Currents also are variable, but directed mainly along the Bay at a maximum speed of 46 cm/sec.

The Bay is home to a wide variety of shellfish, including the European Flat Oyster (*Ostrea edulis*) and the Black Mussel (*Mytilus galloprovincialis*), two species first cultivated in the area at least during the time of Romans. Annual production currently reaches about 2.500 t, more than half of the total for the whole country.

Owing to the value of its natural resources, since 1988 the Bay of Mali Ston has been designated a "specially protected reserve at sea".

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The problem

Problem

The former Yugoslavia underwent relatively rapid economic development in the late 1970s. Within the framework of the so-called Southern Adriatic Project—which included construction of the aforementioned town of Neum—a number of projects were initiated along the Adriatic coast. These generally were meant to support development of foreign tourism, as well as certain key industries. Unfortunately, they often were planned without paying due attention to important local matters, such as those relating to cultural heritage and regional traditions. Issues relating to the activities of traditional fisheries and aquaculture, for example, largely were neglected.

As a result, the Adriatic coast now contains the remnants of a variety of unsuccessful projects (e.g., those in and around Kaštela Bay, the Šibenik area, Bakar Bay). More often than not, the cause of their ultimate demise can be traced to their negative impacts on traditional ways of life and the local environment.

A similar situation was expected to occur in the Bay of Mali Ston, because politicians from Sarajevo then strongly supported implanting what was touted as a "coastal Bosnian city". Local authorities, however, motivated by the exceptionally strong grass-roots support of their constituents, appealed to the Croatian Academy of Science and Arts, to a number of committees for environmental protection, and to UNEP to prevent the chronic pollution that ultimately would destroy of the Bay's ecosystem and its shellfish beds. They proposed, instead, that the project be redesigned according to criteria that would respect the tenets of sustainable development and guarantee the highest degree of environmental protection.

Resolution of the Problem

Rješenje problema

Especially because of the public pressure voiced through the broadcast and print media, and owing to the desire of officials on both sides of the issue to avoid potentially damaging political consequences, a Croatia - Bosnia & Herzegovina Commission for negotiations was established.

The unyielding insistence that ecological principles be respected, and that the highly valued natural resources of the Bay—the economic basis of the surrounding communities—be protected, eventually led to acceptance of the more costly regional sewage system (Fig. 2).

This system was, in fact, completed in 1988 and remains operational to this day. Of importance, the system was designed to permit future 'upgrades'. That is, it can accommodate additional lines, either from the direction of Metković or from nearby villages not currently attached to the disposal network. Thus, this bit of policy and engineering foresight will foster

sustainable development for the region for the near future.

Conclusion

Zaključak

Certain elements of any nation's natural heritage, once destroyed, never can be restored—at any price. The physical beauty, natural resources, and traditional lifestyle of the Croatian coast—one of the more attractive and as yet undeveloped areas to be found in the Mediterranean—were jeopardized by uncontrolled development in the late 1970s and throughout the 1980s. This raised many potentially very serious environmental problems.

Although it often may, at first blush, seem prohibitively expensive to implement solutions that protect the environment in a manner that applies the concepts of sustainable development, it nevertheless is, in many cases, profitable in the long run. For example, the town of Neum indeed was established and now is a thriving regional center of trade and services frequented by people from the region; but the shellfish aquaculture that is the economic foundation of Mali Ston and surrounding communities—seriously threatened by the original development plan—has been protected, and is thriving, too.

The challenge is to balance the economic development of an impoverished and undeveloped region with rational conservation of its most valuable resources. In the case of the Bay of Mali Ston, the balance has been struck: The Bay's resources remain well preserved. Some neighboring areas, however, yet are subjected to serious threats.

The economic pressure to develop tourism and its related support sectors, without due consideration for the environmental consequences of these activities, has the clear potential to erode the natural richness of Croatia's coastal waters. As such threats continue to arise, there looms the danger, especially in the vicinity of particularly sensitive sites, that some components of this region's marine and coastal ecosystems will be irreparably damaged.

There are many ongoing and planned activities, the charge of which is to address these threats. Some are supported partly by the international community (e.g., UNEP, EU, GEF). These activities can be categorized into those that focus on pollution control and environmental protection; mariculture development; and those related to integrated management. This list is not exhaustive, but suggests the scope of activities undertaken in current baseline studies.

Reasonable coastal development strategies must be formulated, and these must be supported within the context of the limitations of a region's natural resources and socio-economic constraints. A region's cultural heritage and natural resources both must be combined in calculating an area's capacity for any proposed development.

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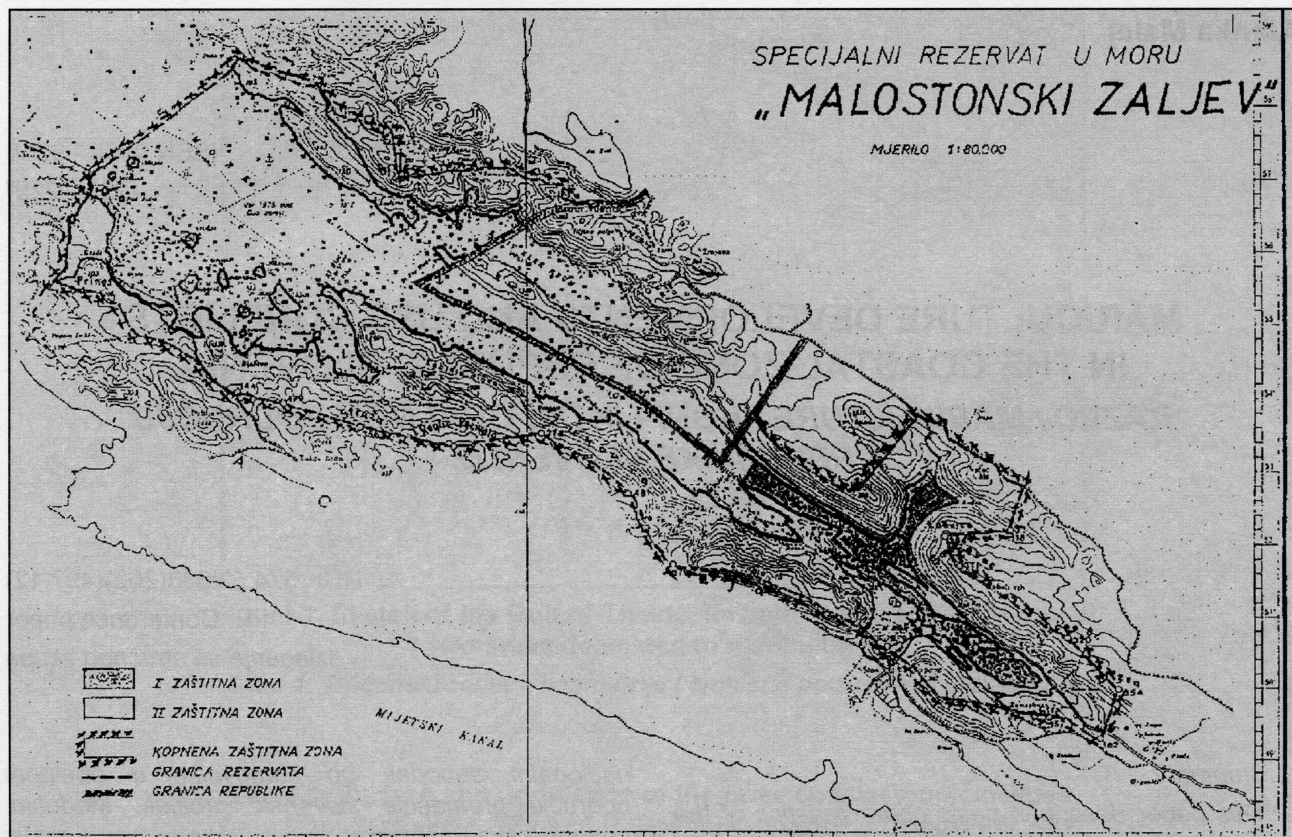


Figure 1. Bay of Mali Ston – borders of protected area of a special reserve at sea.
 Slika 1. Malostonski zaljev- granice posebnog rezervata u moru

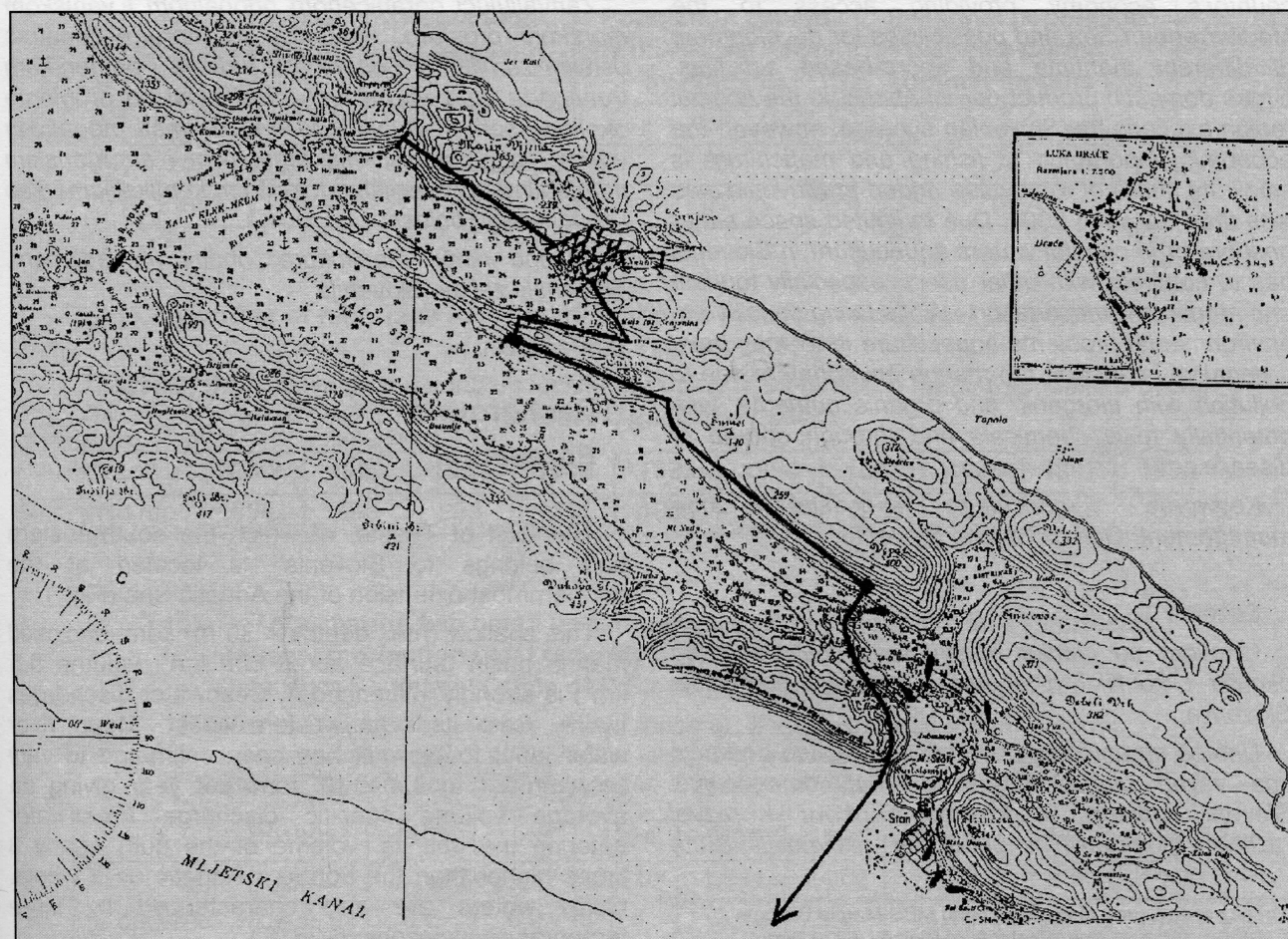


Figure 2. Bay of Mali Ston – outline of the sewage pipeline system
 Slika 2. Malostonski zaljev- nacrt kanalizacijskog cjevovoda