

Improper backfilling of beaches destroys all life

It also affects flora and fauna – entire meadows of strictly protected species of seaweed (genus *Zoostera*, *Cymodocea nodosa* and *Posidonia oceanica*), which enrich the sea with oxygen and are habitats for many species of fish, snails and crabs. Algae and animals are also affected, especially sessile or attached species such as sponges, corals, mosses, locusts, etc. The beaches are replenished, filled and expanded, which increases the artificial share of the coast compared to the natural one. In addition, a good part of the beaches are filled with unsuitable, waste construction materials and gravel in which there is a lot of earth and mud. The sea disperses sludge that settles over large areas and creates sedimentation that permanently suffocates the natural marine flora and fauna. Makarska, Podgora, Jadranovo, Crikvenica and Vruja Bay near Omis are some of the locations where the devastation is taking place. Social media pages have been heated in recent days with footage and comments from people witnessing the devastation.

A good part of this devastation takes place under the pretext of feeding the beaches. Namely, during the winter, the sea waves driven mostly by the south and the mistral wind pull the gravel from the beaches, so it must be added from time to time, which is called top-dressing, which is part of the usual maintenance of beaches. However, it often happens that during the top-up, parts that were not previously filled are filled in in order to increase the areas under the beaches without the necessary permits, which require time and effort. Marine biologist Petar Kružić from the Faculty of Science in Zagreb warns that filling the shores and beaches with unsuitable materials before the tourist season is gaining momentum.

“Although there are positive examples of beach replenishment where attention is paid to what material is added and how much of that material will be used, there are more and more examples of how this procedure turns into an ecological catastrophe,” says Kružić. “There are many examples of beach landscaping with unsuitable materials such as construction waste, gravel with a large percentage of soil and even the soil itself. The share of soil in the gravel that feeds the beach should not exceed 5% so that clay particles do not negatively affect the underwater world around the beach. Material with a larger amount of land should be used only to arrange the uppermost part of the beach which is not reached by waves and where there is no danger that the earth material will end up in the sea,” explains our biologist.

Pero Ugarković, head of the Podvodni.hr portal, says that the destruction of the natural coast will result in the impoverishment of the fish stock, which will reduce the quality of our

catering offer.

"The areas that are being filled were mostly favorable areas for the growth and development of juvenile fish," says Ugarković.

"In the study by Matic-Skoko et al, juvenile fish communities were monitored for 17 years at two sites that are natural habitats and it was shown that changes such as shore embankment have the greatest effect on reducing juvenile fish numbers. Destruction of natural shores is currently a bigger problem than This is a logical conclusion because tiny organisms, algae and invertebrates that have lost their habitat lead to change at higher levels of the food chain. Finally, small resident species, endemics, slower swimmers, and finally in the long run those fish species that "Since the embankment is constantly and rapidly accelerating, it is inevitable that it will accelerate the process of destroying the fish stock," explains Ugarković.

"The problem is in incompetence and suspicious transactions"

"The problem is due to the difference in price because the price of pure stone material without soil and particles smaller than 0.063 mm, in my estimation, is somewhere between 180 and 250 kn per m³, while the price of material with a larger amount of smaller particles and soil is somewhere 0 kn to 180 kn per m³. When you calculate the total price for the required quantities from 5000 to 10,000 m³, you get a big difference. Inspections intervene, but they cannot stop the construction because they have no legal basis for that, "says Carevic.

The extent of the devastation can be seen in the drone footage

Željko Smolčić from the Faculty of Civil Engineering in Rijeka made a compilation of recordings in which, among other things, drones recorded the consequences of filling with illegal material full of earth in Jadranovo. The footage shows the sea spreading tiny particles of earth to surfaces measured in hundreds of square meters. He points out that last year the City of Crikvenica supplemented the main beach in Crikvenica with a material that contains a large content of earth and mud. This supplementary material was created as a surplus of material during the deepening of the Dubračina stream bed, and as a mineral raw material it is the property of Croatia. After the case was reported to the state inspectorate, it was forbidden to further supplement the beaches with material that contains soil and sludge. Further supervision by the state inspectorate showed that the supplementary material had been stolen from Croatia. There is even a document that we received anonymously, from which it is evident that the local authorities in Crikvenica eventually reached an agreement with the state attorney's office so that the stolen land was sold to them at a low price.

The devastated seabed of Makarska

The extent of the devastation caused by anthropogenic materials such as rocks, fine gravel and silt in the Makarska submarine is evidenced by photographs taken by members of the Underwater Research Club of the University of Split. Ivana Birčić, who participated in the research and made a report on it, says that the whole area around the embanked beaches is lifeless. Kružić says that it is best to use material that is from the sea or is of similar origin to supplement and fill the beaches. He believes that even concreting is less harmful than filling the ground because concrete is most often placed inside the formwork slabs.

What to expect from inspections?

Critics of the devastation that are taking place believe that the responsibility lies with local authorities who are looking for cheap solutions, which are often carried out without knowledge and expertise.

“Every county and city has institutions that are in charge of this problem. Construction inspections should monitor whether it is done according to regulations. But you know how it is in cities, inspectors often know city officials, and the city is an investor. Should I add something else?” “It is ungrateful to talk about how money is spent, but every county has certain finances for beach maintenance. I think that with these funds beaches can be maintained in an environmentally friendly way without any problems. What worries me most here is the lack of action of the Ministry of Economy and Sustainable Development They should be interested in preventing such catastrophes. We advertise ourselves as the Mediterranean as it once was, and this is by no means that “, says Kružić and adds that legislation should be regulated that would better distinguish between supplementary feeding and expansion and backfilling. new beaches.

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