



SVEUČILIŠTE U DUBROVNIKU  
ODJEL ZA PRIMJENJENU EKOLOGIJU  
UNIVERSITY OF DUBROVNIK  
DEPARTMENT OF APPLIED ECOLOGY

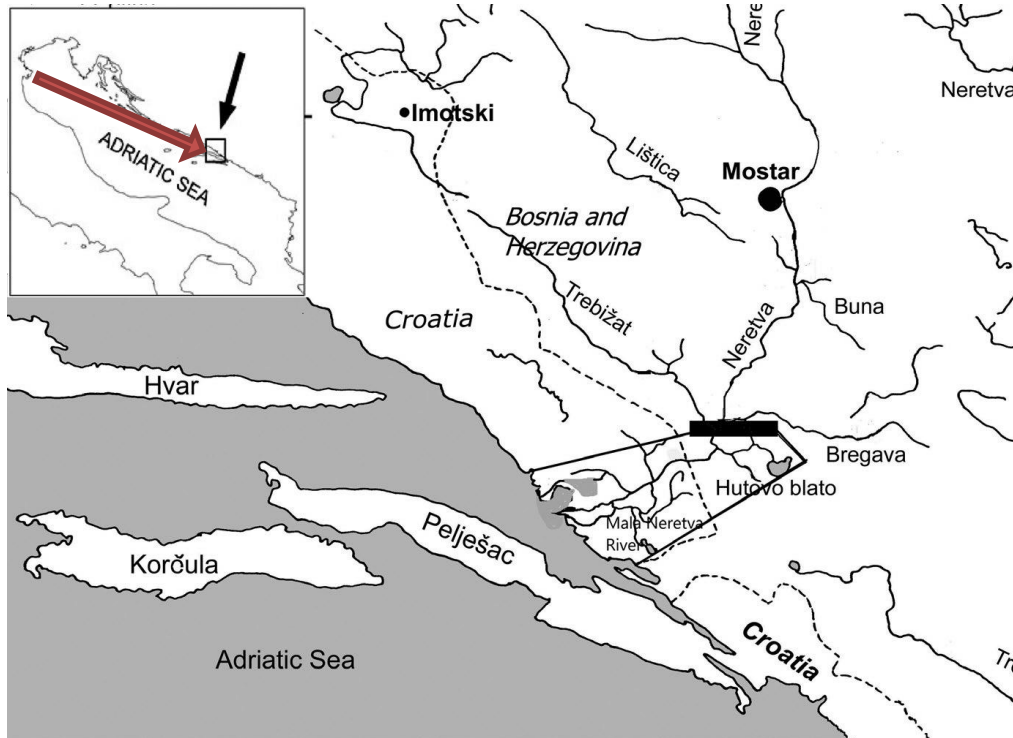
# Potential risks for Croatian shellfish culture due to the invasion of non-native species in the Adriatic Sea

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# Croatian Shellfish Culture

- Shellfish farming includes the cultivation of mussels (*Mytilus galloprovincialis*) and oysters (*Ostrea edulis*) in specially controlled areas that are under constant monitoring. The annual production amounts to about 3,000 tons of mussels and about 2 million pieces of oysters and is sold exclusively on the domestic market. Most of the production is executed in the Malostonski Bay area in a status of special protected reserve.
- (<https://ribarstvo.mps.hr/default.aspx?id=79>)
- The shellfish farming area is in adjacent of most important marine recruitment ground (Neretva Estuary), which also include second important port in Croatia, Port of Ploče, with a significant number of vessels carrying ballast waters.
- The recent appearance of non-native species in the Adriatic Sea has potentially significant risks for the future development of shellfish farming, and attention should be paid to this issue, especially in the increased number of predatory species of fish and crustaceans, as well as some shellfish.
- Lessons from recent years: There was a sharp increase in the number of gilthead seabreams in Malostonski Bay in the period 2010-2020), which caused great damage to mussel farms, even though the scientific and fishing sectors warned of an increase in its abundance in the coastal zone of the Neretvanski channel and the estuary of the Neretva River.
- **THIS PROMOTE NUMEROUS INTRODUCTIONS OF INVASIVE SPECIES AND SUPPORT THEIR QUICK ADAPTATION, POPULATIONS ESTABLISHMENT AND SUBSEQUENT IMPACTS ON LOCAL ECOSYSTEMS AND BUSSINESSES**

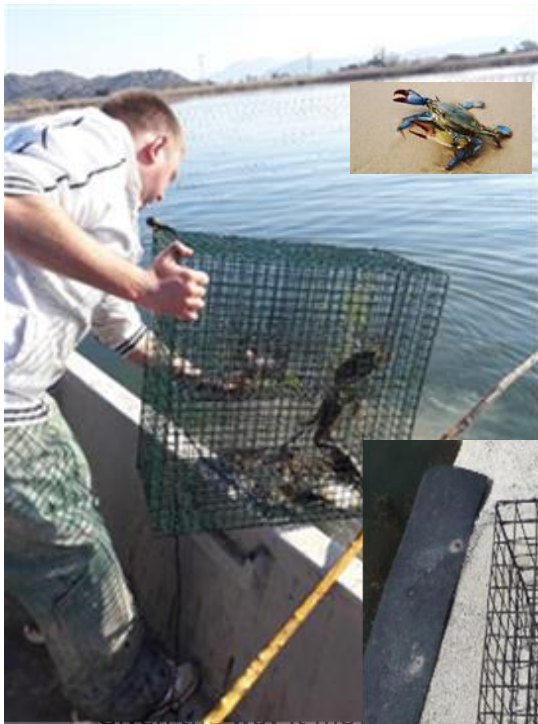
# Map of the Neretva Estuary and Malostonski Bay



ve become invasive in the last 20 years and can harm *alinetes sapidus*, and the Pacific oyster, *Crassostrea*

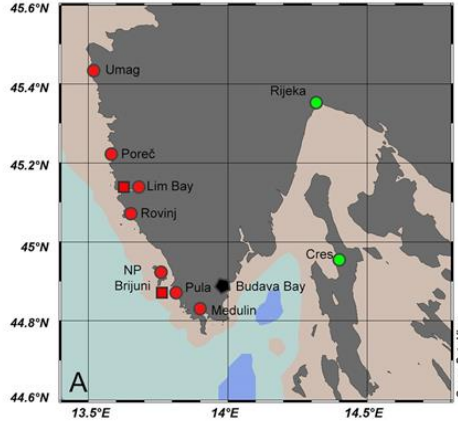
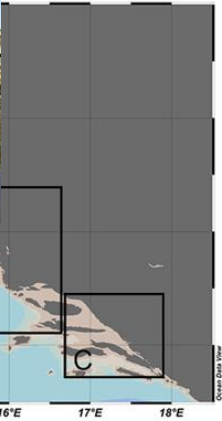


ed in some areas of the eastern Adriatic coast, and the extremely harmful effects on native ecosystems. in 2004, populations were established in 2010 and e Neretva Estuary, and later dispersed from Dubrovnik



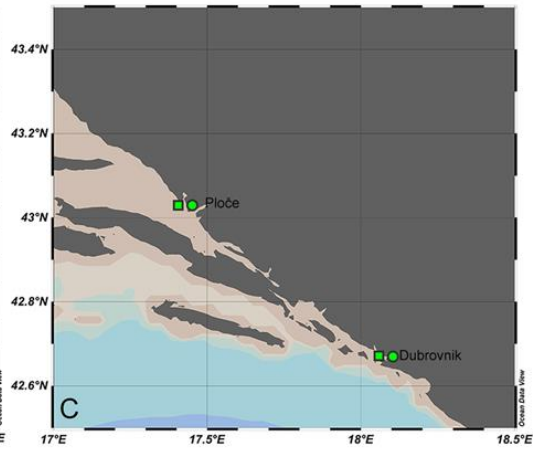
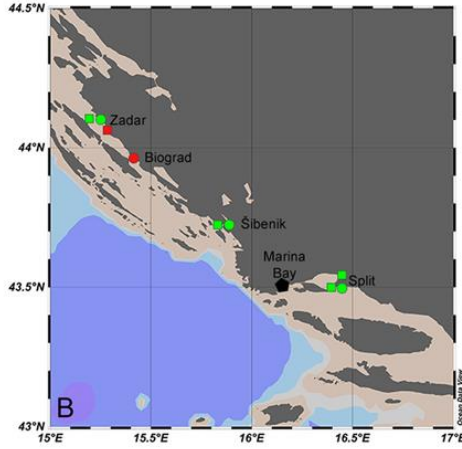
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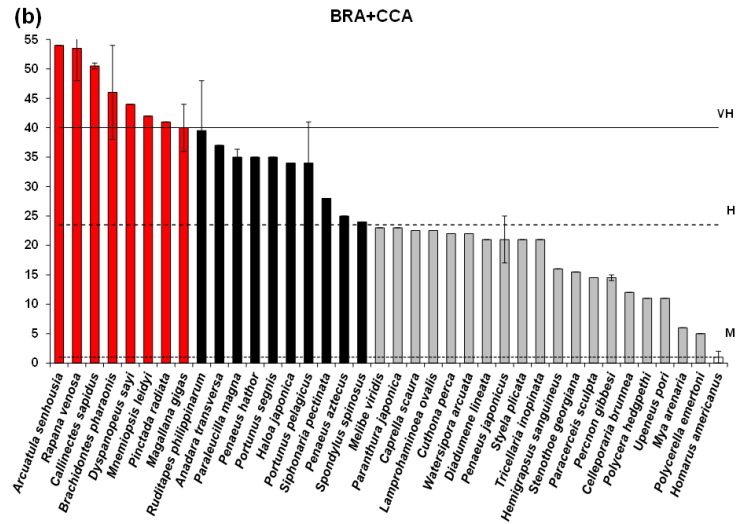
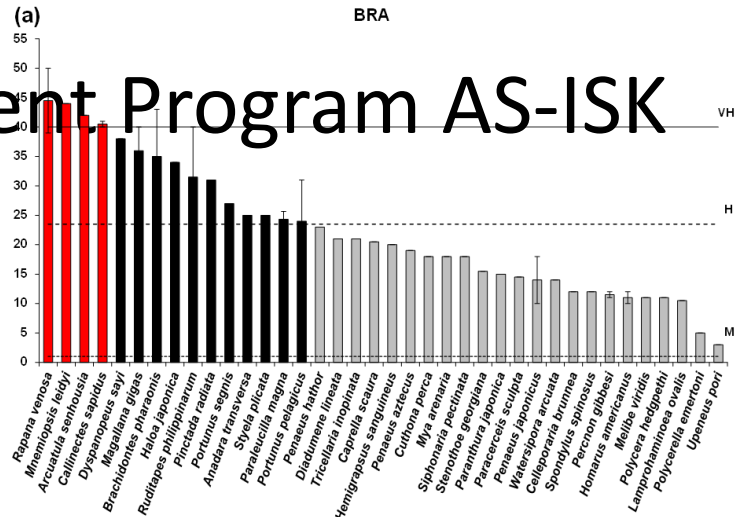
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# Risk Assessment Program AS-ISK

The risk assessment of these species by the Risk Assessment Program AS-ISK has shown that these two species have the greatest potential for damage to ecosystems, fisheries, and aquaculture, and that it is necessary in the short term to take measures to control their populations to prevent further damage.

It is already too late for the blue crab, as it become abundant and target of local fisheries. However, measures should be established for the Pacific oyster, by more frequent monitoring and eradication in the hot spots of introductions.



# Future invasion management potential

