

THE NOBLE PEN SHELL (*Pinna nobilis*) NOW CRITICALLY ENDANGERED



Noble Pen Shell, *Pinna nobilis*, Piran, Adriatic Sea, Slovenia © Borut Furlan

KEY FACTS

- *Pinna nobilis* is a long-lived Mediterranean endemic species, considered one of the biggest bivalve molluscs in the Mediterranean Sea. It has a wide distribution across coastal areas, occurring mainly in seagrass meadows, but also present in other habitats such as rocky bottoms or rhodoliths beds.
- Populations of this fan mussel are strongly dependent on the survival of adults. Successive hermaphroditism (e.g. changing sex at different stages in life) together with low and patchy recruitment make the recovery of populations more difficult and less likely to happen. Whereas fan mussels mainly reproduce during the summer months, the period of larval settlement, which can occur far from the parental sites, is usually concentrated between July and October.
- *Pinna nobilis* plays a key ecological role by filtering water and retaining large amounts of organic matter from suspended detritus contributing to water clarity. Its uniqueness attracts many scuba-divers across the Mediterranean. Besides, its surfaces are colonized by other benthic species, including algae and macroinvertebrates, thus increasing the local biodiversity.
- A mass mortality event affecting *Pinna nobilis* populations was first detected in 2016 along the Spanish coast. The still ongoing mortality outbreak has been found to be caused by a pathogen (*Haplosporidium pinnae*), which rapidly spread throughout the Mediterranean Sea causing mortality rates of 80-100% across many regions.
- Only a few populations are known to remain pathogen-free. However, these are geographically isolated and located in sites with very specific environmental conditions.

MAIN THREATS

Currently the ongoing pathogen-caused mass mortality outbreak is the most worrying and widespread threat to *Pinna nobilis* throughout the Mediterranean Sea. In the past, major threats were very localized and came from illegal fishing, habitat loss, boat anchoring, invasive species and most recently climate change. However, none of these threats have led to the extremely widespread and rapid population declines caused by the ongoing disease.

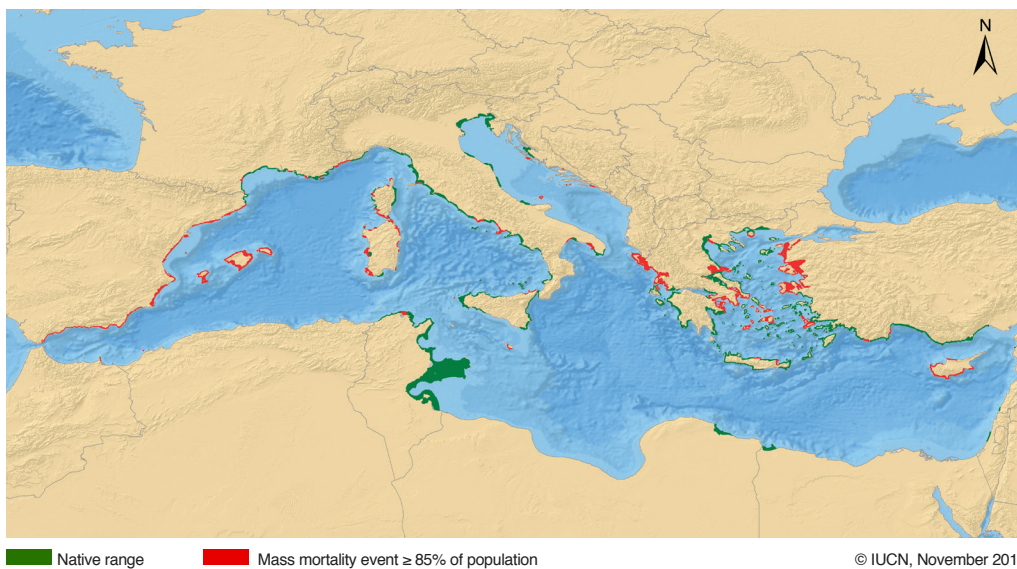
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CONSERVATION STATUS ASSESSMENT

Pinna nobilis has been listed as Critically Endangered on the IUCN Red List of Threatened Species due to the drastic population size reduction caused by the still ongoing mass mortality event and the fact that the causing pathogen is still present in the environment.

CONSERVATION ACTIONS

Pinna nobilis has been classified as a species of Community Interest in need of strict protection by the European Habitats Directive (92/43/EEC) and as an Endangered Species by the Protocol Concerning Specially Protected Areas and Biological Diversity in the Mediterranean from the Barcelona Convention (Annex II).



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CONSERVATION RECOMMENDATIONS

- The natural recovery of impacted populations will solely depend on resistant individuals and recruitment. Therefore, information on the continuous monitoring of the species will be essential to evaluate its potential for future recovery, not only in the sites where the species has survived, but also where it has recently disappeared in order to evaluate the recovery potential of the species in the future.
- There is an urgent need to set up a regional monitoring programme ensuring the exchange of information and observations throughout the Mediterranean Sea. Since natural recovery of populations will depend on recruitment, it is recommended to monitor larval settlements in both affected and unaffected sites by means of larval collectors.
- Further research on the pathogens and vectors is needed in order to better understand the disease, find ways to mitigate it and limit the spread of the pathogen.
- Protection of the species and its habitat must be ensured and prioritized both in unaffected sites and in those harboring surviving individuals and/or having high recruitment potential.
- In the current context, restoration actions and transplants of *Pinna nobilis* should be adequately assessed before being put into practice, to avoid worsening the critical status of the species by moving unknown sick individuals to healthy populations.
- Restoration actions could be undertaken with juveniles obtained from larval collectors and from *ex situ* breeding, the last one needing further research efforts to close the biological cycle. Restoration and translocation actions need to be adequately assessed before being put into practice, in order not to worsen the critical status of the species.

Further recommended actions in this link:

<https://www.iucn.org/news/mediterranean/201907/mediterranean-noble-pen-shell-crisis-pinna-nobilis-june-2019-update>

The IUCN Red List of Threatened Species™ - Mediterranean Assessment

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More details about the species' assessment:
medspecies@iucn.org

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