

**EUROPEAN SPINY LOBSTER *PALINURUS ELEPHAS* :  
THE STELLA MARE RESEARCH CENTER (UNIVERSITY OF CORSICA /  
FRENCH NATIONAL SCIENTIFIC RESEARCH CENTER - CNRS)  
TAKES A NEW STEP TOWARDS THE ECOLOGICAL RESTORATION  
OF THE SPECIES**

*Corte, november 7 2023*

With over 10 years of experience in mastering the reproduction of vulnerable species, the team of researchers and engineers from the University of Corsica and the French National Center for Scientific Research (CNRS) has once again achieved the scientific and technical feat of obtaining european spiny lobster juveniles.

**This year, after just 3 years of experimentation, the scientists of the Corsican experimental center are now rearing 11-month-old juveniles. These juveniles have already reached the minimum release size required to initiate ecological restoration experiments.**



*European spiny lobster juvenile 11-month-old, from controlled reproduction and raised at STELLA MARE*

Since 2021, after the European flat oyster, the European lobster, the purple sea urchin, the giant limpet, the common dentex, and the brown meagre, the efforts of Stella Mare have been focused on mastering the reproduction of the European spiny lobster.

To date, after more than 20 years of research in various countries, only two laboratories in the world have managed to master the reproduction of this species and obtained European spiny lobster juveniles. The objective of the study is to use these individuals to restore depleted stocks. This year, the Corsican laboratory is the only one to have succeeded in producing juveniles.

**The spiny lobster larval rearing, carried out since January 2023, is once again rewarded by the production of juveniles but also by a significant improvement in the results:**

- **459 pre-juveniles obtained (64 in 2022)**
- **42% survival up to the pre-juvenile stage (33% in 2022, 3% in 2021). The highest survival rate cited in the scientific literature is lower than 1%**
- **7 stage VII juveniles, currently 11 months old (as opposed to stage III in 2022), which will be used for defining ecological restoration techniques. The minimum size required for transfer to the sea and the initiation of ecological restoration experiments have already been reached.**

**The complexity of the rearing is due to the number and fragility of larval stages, the duration of rearing, feeding and the health constraints of the process.**

The spiny lobster *Palinurus elephas* is observed in the North-East Atlantic Ocean (from Norway to Mauritania) but especially in the Mediterranean. In its southern distribution, it is observed from North Africa to Morocco, the Canary Islands and the Azores.

Classified as a « vulnerable species », it is on the Red List of Threatened Species by the International Union for the Conservation of Nature (IUCN). The spiny lobster is also listed in the third appendices of both the Barcelona (list of species whose exploitation is regulated) and Bern conventions (protected fauna species).

Its high selling price (50 to 100 € / kg) results from a relative scarcity confirmed by the continuous decline in catches recorded over fisheries of the European Union (from 1,100 tons in 1969 to 434 tons in 2017). In France, on the Atlantic coast, fishing increased from 1000 tons / year in the 1950s to 25 tons in 2010\*\*; in Scotland, from 271 tons in 1959 to 20 tons in 2010; in Portugal, from 400 tons / year in 1990-1992 to 12 tons in 2006-2007.

Ecologically, a vicious circle has clearly set in. The scarcity of the resource has led to an increase in fishing effort (longer nets, more boats, deeper fishing,...etc.) and a repercussion on the whole of biodiversity with the increase in bycatches, the impact on the seabed and higher greenhouse gas emissions for each spiny lobster caught by fishermen\*\*\*.

An alarming report was drawn up in Corsica and Sardinia, two of the largest lobster fisheries in Europe, where there was a marked decline in catches between 1954 and 2008. In Corsica, while 300 tons of lobsters were fished in the 1950s\*\*\*\*, only 61 tons on average were fished over the past two years. In northern Sardinia, catches decreased by 70% between 1976 and 2001.

It is important to remember that for the Corsican fishing sector, lobster generates an annual income of more than 4 million euros. Lobster fishing alone accounts for up to 70% of the Corsican fisheries income. Knowing the strong economic benefits generated, a real expectation in terms of mastering the spiny lobster reproduction emanates from sea professionals. This scientific advance could thus ensure the survival of Corsican artisanal fishing economy or even contribute to its development, while perpetuating a centuries-old heritage activity.

This breakthrough is now paving the way for compensation methods for fishing activity in order to preserve the presence of the spiny lobster in its natural range. A transfer of individuals could also be considered at the European level for the restoration of depleted populations (with the necessary genetic precautions). The challenge of preserving biodiversity is at the heart of the discussions which have strongly mobilized scientists from the University of Corsica and the CNRS.

Economically, mastering the spiny lobster reproduction could help stem the declining catches in Europe due to overfishing. On an environmental level, the Stella Mare research center is studying how the current process could lower the greenhouse gas emissions of crustacean fisheries, by restoring depleted spiny lobster populations.

This exceptional success once again materializes the platform's desire to transform research into wealth: by promoting eco-responsible fishing and sustainable aquaculture, enhancing and diversifying production from different marine species, managing a sensible use and exploitation of resources.

These results obtained over three consecutive years testify to the reliability and scientific quality of the public research carried out by the Stella Mare marine research center, in close collaboration with Corsican fishermen and fish farmers thus positioning the platform from the University of Corsica and the CNRS as a leader in the marine and coastal ecological engineering field. The ambition set from the start of Stella Mare activity is once again becoming a reality: to provide fundamental and applied research inducing cutting-edge innovations in touch with major societal challenges leading to a sustainable and smart exploitation of our bioresources.

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\*Kittaka, J., Kudo, R., Onoda, S., Kanemaru, K., Mercer, J. P. 2001. Larval culture of the European spiny lobster *Palinurus elephas*. *Mar. Freshw. Res.* 52(8), 1439-1444. <https://doi.org/10.1071/MF01188>

\*\*Goñi, R. 2014. *Palinurus elephas*. *The IUCN Red List of Threatened Species 2014*: e.T169975A1281221. <http://dx.doi.org/10.2305/IUCN.UK.2014-1.RLTS.T169975A1281221.en>

\*\*\*Parker, R.W.R., Blanchard, J.L., Gardner, C., Green, B.S., Hartmann, K., Tyedmers, P.H., Watson, R.A. 2018. Fuel use and greenhouse gas emissions of world fisheries. *Nature Clim Change* 8, 333-337.

\*\*\*\* Groeneveld, J.C., Goñi, R., Diaz, D. 2013. *Palinurus Species*. In: Phillips, B.F. (ed.), *Lobsters: Biology, Management, Aquaculture and Fisheries*, pp. 326-356. John Wiley and Sons, Oxford.