PosiFarm: a *Posidonia oceanica* nursery for the restoration of the Posillipo seabed (Naples, Italy)

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This project aims to restore *Posidonia oceanica* meadows along the Posillipo coast in Naples (Italy) by experimenting with new methodologies based on transplanting seedlings grown under controlled conditions.

The seeds were collected in spring 2025 along the coasts of southern Italy thanks to a citizen science initiative. Four main areas were selected: two in Campania (Ischia and Cilento) and two in Sicily (Vindicari and Marsala). The visually viable seeds, selected after sorting, were germinated in dedicated tanks using different types of substrate: rock wool, coarse organogenic sand, and biodegradable peat pots filled with rock wool or organogenic substrate. Some seeds were also germinated in the dark to evaluate the effect of light on germination.

Once germinated, 1071 seedlings were transplanted, from July to November 2025, into previously identified dead matte areas within the Marine Protected Area of the Gaiola Underwater Park, using two different techniques. The first method involved anchoring the seedlings to the seabed using steel and coconut fiber biomats as support, supporting up to 21 seedlings at a time. The second technique consisted of individual square iron frames designed to independently anchor the seedlings to the substrate. Additionally, some replanting stations were covered with wire mesh cages to protect the seedlings from herbivores, such as *Salpa sarpa*, while others were left unprotected to assess differences in growth patterns under varying grazing pressure.

The different replanting stations were then periodically monitored to collect data on survival rates in relation to the different transplanting techniques, cultivation, and provenance.

The project's primary objective was to test methods for restoring *Posidonia oceanica* habitats that would avoid impacting existing meadows while simultaneously allowing the transformation of stranded seeds destined for drying into new meadows. A secondary goal was to implement these activities with low-cost equipment, making the method reproducible and exportable.