

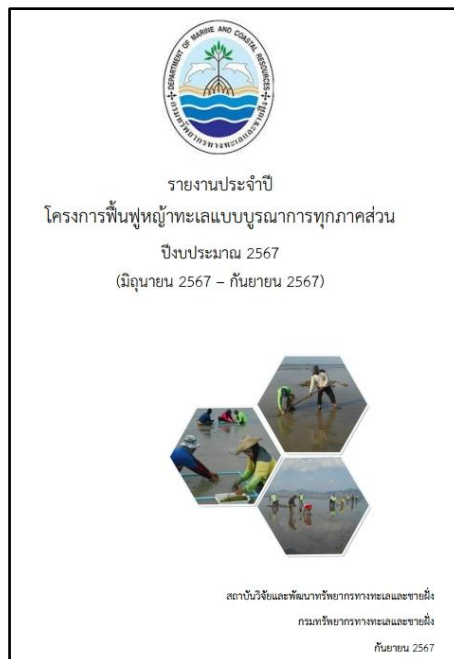
## Milestone 38 Determine Success of habitat restoration project within Suratthani

### Department of Marine and Coastal Resources

June 2025

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The Department of Marine and Coastal Resources (DMCR) has prepared an annual report on the integrated seagrass restoration project for all sectors. Fiscal year 2024 (June 2024 – September 2024) as shown in the picture



Restoration of seagrass resources is included in the Marine and Coastal Resources Action Plan 2016-2017 and the 20-year Strategic Plan (2017-2036) under Strategy 1: Forest and Biodiversity Management, with the goal of increasing the abundance of coral reefs, seagrass beds and marine ecosystems by no less than 3-9% within 20 years. It also focuses on integrating cooperation from all sectors in the supervision and management of marine resources sustainably.

In fiscal year 2024, the Marine and Coastal Resources Research and Development Institute has been allocated a budget of 3,741,000 baht to carry out seagrass restoration by transplanting 48,000 plants. The goal is to plant 1,600 sea grass clumps/rai in 4 areas, totaling 30 rai: 1) Ban Hat Hua Laem, Tha Mai District, Chanthaburi Province, 5 rai; 2) Ao Thong Tanod, Koh Samui District, Surat Thani Province, 5 rai; 3) Koh Mak Noi, Koh Panyi Subdistrict, Mueang

District, Phang Nga Province, 15 rai, and 4) Ao Farang, Koh Lanta District, Krabi Province, 5 rai.

From the survey and monitoring of changes in the status of seagrass habitats in Thailand in 2024, it was found that the seagrass area is approximately 97,784 rai, divided into the Gulf of Thailand 33,827 rai ( 35%) and the Andaman coast 63,957 rai ( 65%). There are 12 species of seagrass , namely, round-leaved sedge, sawtooth sedge, sea cogongrass, dwarf sedge, clear sedge, large-leaved sedge, small-leaved sedge, kaffir lime leaf, needle chives, sea chives, sea onion grass, and turtle sedge, covering 16 coastal provinces, including Trat, Chanthaburi, Rayong, Chon Buri, Chumphon, Surat Thani, Nakhon Si Thammarat, Songkhla, Pattani, Narathiwat, Ranong, Phang Nga. Phuket, Krabi, Trang and Satun

For Surat Thani Province, it was found that in 2024 , the seagrass area increased to 13,167 rai. Increased by 10.52 percent compared to the previous year (2023, the area is 11,913 rai)

Restoration of seagrass resources is specified in the Action Plan for Marine and Coastal Resources for 2016 - 2017 and 20 years (2017 - 2036), Strategy 1, Forest Management and Biodiversity, according to Goal 3, to increase the completeness of coral reefs, seagrass areas and marine ecosystems, with the objectives of:

- o The completeness and diversity of important marine resources will increase by no less than 3 – 9 percent. Within 20 years

- o There is an integration of cooperation among all relevant sectors in the supervision, control and management of the appropriate use of marine resources in accordance with their renewable potential and in accordance with academic principles.

**The summary of the work procedure is as follows:**

- 1) Select the area using the method of assessing the suitability of the seagrass transplanting area as designed by Kasetsart University and the Department of Marine and Coastal Resources.

2) Prepare sea grass seeds/seedlings for use in supplementary planting according to the specified method, including the seedling nursery process for use in supplementary planting.

3) Carry out the process of planting seagrass seedlings in the target areas by promoting participation from the local communities.

4) Monitoring and evaluating the success of the implementation project. The objectives are to monitor and evaluate the success of the seagrass and ecosystem dimensions (survival rate, growth and habitation ( Macrobenthos, epiphyte)) . The data used for analysis must have base line data and should be monitored continuously.

#### **Monitoring the results of seagrass restoration by transplanting**

1. Study the growth of the restored seagrass by monitoring 1) leaf development (number of leaves (old and young), length and width of each leaf), 2) root system (root characteristics, root length, number of root veins). Data should be collected monthly. At least 4 seagrass plants ( n) should be used each time.

2. Study the survival rate of seagrass by setting a permanent quadrat . Size 10 x 10 meters, at least 4 quadrats (n), count the number of sea grass plants in the plot, collecting data every month.

- Survival rate at  $T_n = (\text{Number of seagrass at } T_n \times 100) / \text{Number of seagrass at } T_0$
- Mortality rate =  $100 - \text{Survival rate}$

However, transplanting in each area has different techniques and methods. The survival rate assessment will change according to each area.

3. Study the community of benthic fauna (density and species diversity) using a core with an 8-inch diameter, collecting soil samples 10 cm deep. Collect at least 4 replicates (within a permanent quadrat) to analyze the species diversity and density of benthic fauna in the laboratory, with data collected every month.

4. Study the macroinvertebrate community (density and species diversity), identify species and count the number of macroinvertebrates found in a permanent quadrat . 10 x 10 meters, at least 4 quadrat (n) , with data collected every month.

## Results of operations

In fiscal year 2024, the Marine and Coastal Resources Research and Development Institute has been allocated a budget. The amount of 3,741,000 baht to carry out seagrass restoration by transplanting 48,000 plants, with a target of planting 1,600 clumps of seagrass per rai in 4 areas, totaling 30 acres, by assigning subordinate agencies to carry out the work in various appropriate areas, with seagrass restoration carried out in each area.

The results of the integrated seagrass restoration project in Ao Thong Tanod, Koh Samui District, Surat Thani Province are as follows :



Integrated seagrass transplantation in all sectors in Ao Thong Tanod, Koh Samui District, Surat Thani Province, has been divided into 2 operations.

1st time on 14 June 2024, transplanting 4,000 sea grass plants on an area of 2.5 rai. 1,500 of them were saplings obtained from growing seeds and 2,500 plants separated from clumps. Before transplanting, there will be an understanding of the correct techniques and methods. It is determined that the plants will be transplanted in a specified spot with sticks planted in a line, with each clump 2.84 meters apart so that the grass is distributed over the 5 rai area.



2nd time on June 18, 2024, transplanted 4,000 sea grass plants from the clumps and planted them in the designated planting area, following the first time on an area of 2.5 rai.



After 1 month of transplanting, a follow-up was conducted and it was found that the transplanted sea grass had a survival rate of 80%. The survival rate of seagrass grown from seedlings was only 20%, while the survival rate of seagrass transplanted by dividing the clumps was around 90%. This may be due to the fact that the sea temperature is still higher than normal. The seagrass that survived grew well, had good leaf and root development, and 60% of the new leaves were sprouts. The leaf length was 5-25 centimeters and the width was 1.2-1.7 centimeters. Some shoots had rotten and broken leaf tips. The above-ground parts of the grass were rotten and broken. On average, 2 new roots were sprouts per shoot, with a length of 0.2-5 centimeters. After the monitoring results showed that the survival rate of seagrass grown from seedlings was low, the contractor was notified and new plants were replanted from the seagrass obtained by dividing the clumps in the same area where the grass grown from seeds was previously planted.

After 2 months of transplanting, it was found that the transplanted sea grass had a survival rate. 80% good growth, good leaf and root development, found 1-2 new leaves, leaf length 5-25 Centimeters, leaf width 1.2-1.8 centimeters, some plants have leaf tips that are rotten and broken off and seaweed is found growing on the base of the plant and grass leaves which affects the growth of the sea grass. New roots were found growing 2-10 roots with a length of 2-8 centimeters, average 4 roots per plant



In addition, the results of environmental changes in seagrass plantations were monitored at different time periods by studying the amount of aquatic animals that live there, benthic marine animals, and soil and water quality.

The amount of aquatic animals was measured by visual observation and by using floating nets to collect samples. Benthic animal samples were collected using a core with a diameter of 8 inches and soil samples were collected 15 meters deep. Centimeters, four replicate samples were collected to analyze species diversity, density of benthic fauna, study of large marine fauna communities (density and diversity), identify species and count macroinvertebrates , and collect sediment samples to study grain size, organic matter, and measure water quality. It was found that:

o The amount of aquatic animals in the seagrass plantation. From visual observation, it was found that during the monitoring period, there were hardly any aquatic animals living there because the water temperature near the shore was still high. The first monitoring Found 3 types of fish, 2 types of crabs and 1 type of leech. The second time, found 2 types of fish, 1 type of crab and 1 type of leech. type

o Benthic marine animals: The abundance of sea worms increased significantly, while the abundance of bivalves decreased.

o General water quality: The important factor is temperature. In the second follow-up in September, the seawater temperature dropped to 31.6 degrees Celsius from 33.8 degrees Celsius during the planting period in June. In August, when the first follow-up was conducted, the temperature was 33.6 degrees Celsius. The salinity value decreased slightly.

o Sediment characteristics: On average, the particle size of sediment is more sandy than mud. The ratio of sand:mud = 4:1 and the total organic matter content is quite low.



