Annual Report

on SDG14 Life Below Water

14.3 Supporting aquatic ecosystems through action

14.3.3 - Does your university as a body work directly (research and/or engagement with industries) to maintain and extend existing ecosystems and their biodiversity, of both plants and animals, especially ecosystems under threat?

Connecting Habitat Conservation, Ecological Research and Community Management

Thaksin University works directly with communities and partner organizations to maintain aquatic habitats and the biodiversity they support in Songkhla Lagoon and its connected waterways. The University's approach brings ecological research into practical conservation: information about organisms and environmental conditions informs habitat interventions, while community participation supports their continuing care.

The work recognizes that aquatic biodiversity depends on more than individual structures or species. Fish require suitable shelter and environmental conditions, vegetation contributes to habitat complexity, and conservation areas need arrangements that address disturbance and resource use. In 2025, the University connected these elements through its **Academic Service Unit for Natural Resource Management in the Songkhla Lagoon Area**, participating researchers and community partnerships.

Activities included fish-house construction and maintenance, support for community conservation areas, water quality and fish surveys, and cooperation enabling conservation activities in six communities. These activities build on earlier research while providing a continuing mechanism for direct engagement with local ecosystems.

Maintaining Living Habitats through Aquatic Life Shelters

The **Aquatic Life Shelter**, or **Living Fish House**, program connects university expertise with community efforts to maintain aquatic habitats. Researchers contribute assessment and technical advice, while fishers contribute knowledge of local conditions, aquatic organisms, and the practical requirements of managing the structures.

At **Ban Mai, Singhanakhon District, Songkhla Province**, the University participated in a community fish-house activity on **28 May 2025**. University staff provided academic and technical information, explained construction methods and worked alongside residents. Community members contributed local knowledge and labour and participated in the care and assessment of the area.

The Ban Mai model combines a shelter structure with planted mangroves in shallow water near existing mangrove habitat. Its ecological purpose is to connect living vegetation with structural shelter for aquatic organisms. Maintenance therefore concerns both the plants and the physical structure, together with conditions in the surrounding water.

Earlier university research documented the design and observations of leaf-litter accumulation and juvenile aquatic organisms around the structures. This provides a scientific foundation for the intervention. The historical observations are distinguished from the activities and ecological records collected during 2025.



Public evidence:
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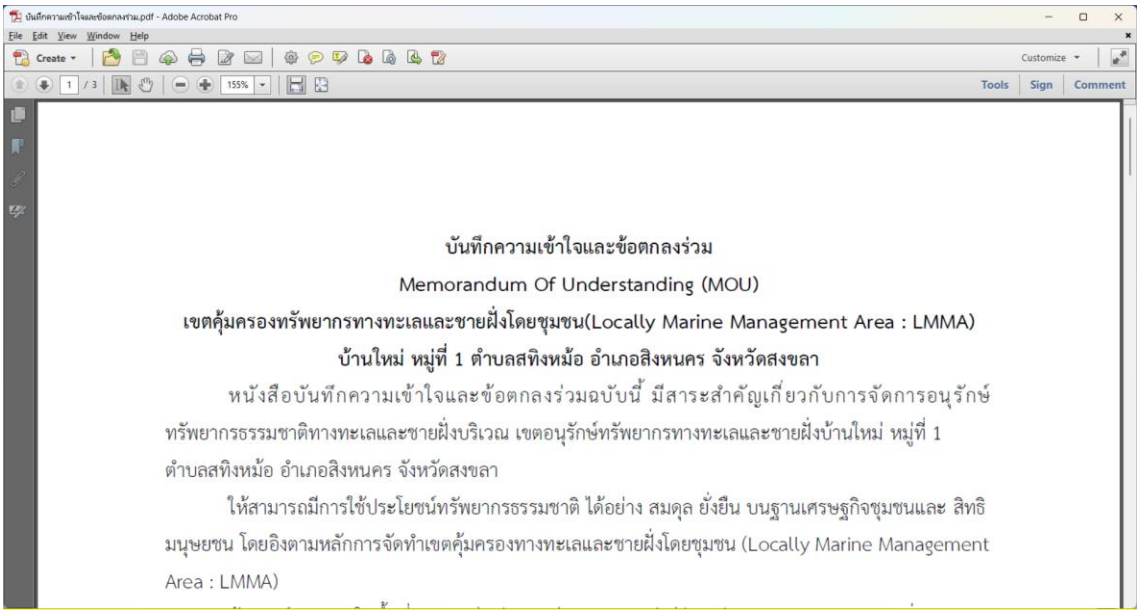
Protecting the Surrounding Conservation Area

Habitat interventions are supported by arrangements governing the use of the surrounding environment. The Ban Mai cooperation framework, documented in an MOU dated **10 September 2025**, identifies a conservation area of approximately **384 rai, equivalent to 61.44 hectares**.

The framework addresses fishing restrictions, protection of fish houses, maintenance, identification of the managed area and surveillance. It also provides for educational and research activities. These provisions connect the physical habitat work with responsibilities intended to limit disturbance and support continuing stewardship.

The University's responsibilities include academic support, knowledge transfer, technology and innovation, and research concerning ecosystem restoration. Community members contribute local care and observation, while fisheries authorities, local government, the Office of Marine and Coastal Resources No. 5 and the Thai Sea Watch Association contribute within their respective responsibilities.

The area figure describes the space identified in the conservation framework. The contribution to ecosystem maintenance is demonstrated through the management arrangements and activities undertaken there; it does not imply that ecological recovery has already been measured across the entire area.



Memorandum of Understanding (MOU) on Collaborative Management of the Ban Mai Community Marine and Coastal Conservation Area, Sathing Mo Subdistrict, Singhanakhon District, Songkhla Province.

Matching Habitat Interventions to Local Conditions

The University's research on community fish houses provides a basis for adapting interventions to different lagoon environments. Earlier work documented cage-type shelters in shallow, relatively sheltered water; concrete-based branch clusters in deeper areas with stronger currents; linear branch arrangements near shallow shorelines; mangrove-associated shelters; and traditional branch piles.

These designs reflect differences in depth, substrate, wave exposure, currents and surrounding habitat. Their relevance to conservation lies in selecting structures suitable for the receiving environment and the organisms expected to use them.

During 2025, the University continued applying this site-specific approach with community partners. The construction of **Fish House No. 10 on 11 November 2025 at Moo 8. . Meuang District, Songkhla province,** used a cage-type design in response to shallow water and soft-bottom conditions. University staff provided technical guidance and participated in construction, working with residents and partner organizations.

The earlier study's before-and-after ecological measurements were collected in 2022. They support the research foundation of the program and are not presented as biodiversity gains achieved in 2025.



Public evidence: https://oop.tsu.ac.th/detail.php?id_list=147&aNum=20251119103926



Public evidence: https://www.tsu.ac.th/home/details.php?id=5616

Using Field Research to Understand Aquatic Biodiversity

The University's field engagement provides information about the organisms and environments that conservation seeks to maintain. At Ban Mai, community-based water quality and fish surveys continued **every three months during 2025**.

The University supported survey design, training in equipment use, verification of fish identification and analysis. Residents participated in sample collection, measurements, recording and observation. Water quality parameters included temperature, salinity, dissolved oxygen and pH, while fish surveys recorded species, numbers, sizes and weights using traditional fishing gear.

The surveys documented **32 fish species in 2025**. This provides a reporting-year record of observed diversity at Ban Mai and a basis for comparison with earlier surveys. It does not, by itself, establish an increase caused by the fish houses; interpretation considers survey timing, gear and sampling effort.

The University's 2025 activity records also include a survey at **Khlong San Daeng on 23 January** and field activities at **Khlong Nui on 25 June**. These activities extended ecological investigation into connected local waterways. At Khlong San Daeng, the research examined fish diversity, water quality and aquatic habitat conditions. At Khlong Nui, the activities assessed water quality using freshwater macroinvertebrates as biological indicators. The information was shared with school students, community members and the municipality to support environmental learning and inform future improvements to local waterways.

Together, these surveys connect conservation with evidence about local aquatic communities. Results are discussed through meetings involving the Academic Service Unit, communities and relevant organizations, supporting the review of habitat conditions and investigation of environmental concerns.



Habitat characteristics of Khlong San Daeng at the fish diversity survey site.

Public evidence:
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Public evidence:
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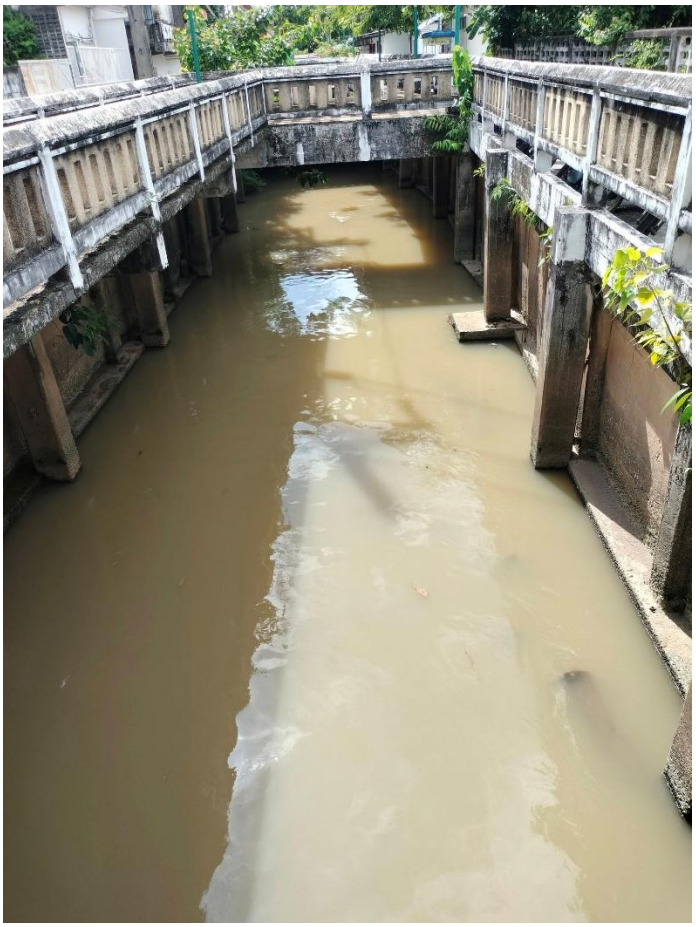

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Habitat characteristics of Khlong Nui at the water quality and benthic diversity for water quality monitoring site.

Complementary Knowledge on Aquatic Species

The University also organized a practical workshop on **glass-catfish breeding and hatchery culture on 4 November 2025**. This activity shared technical knowledge concerning a locally relevant aquatic species with fisheries community around Thaisin University.

The workshop complements habitat conservation by developing knowledge of aquatic species and their culture requirements. Its documented contribution is technical knowledge transfer; a reduction in wild capture or recovery of natural populations is not inferred without follow-up evidence.





Summary

In 2025, Thaksin University contributed directly to aquatic ecosystem maintenance through fish-house activities, mangrove-associated habitat management, community conservation arrangements and ecological field surveys. At Ban Mai, the conservation framework identifies **384 rai, or 61.44 hectares**, while quarterly surveys recorded **32 fish species**. Provincial cooperation supported habitat conservation activities in **six communities**, and surveys in connected waterways extended the research contribution. Together, these activities connect scientific knowledge, living habitat structures and community responsibilities with the continuing protection of aquatic ecosystems and their biodiversity.