

A programme which combines the collaborative efforts of universities, AFCD, as well as NGOs in Hong Kong.

Citizen Science Programme for Subtidal Habitats in Hoi Ha Wan Marine Park



漁農自然護理署 x 中文大學
海下灣海岸公園
公民科學家計劃

This two-year citizen science programme was conducted in Hoi Ha Wan Marine Park (HHWMP) and was co-organised by the Agriculture, Fisheries and Conservation Department and the Chinese University of Hong Kong. By providing “hands-on” underwater survey experiences for the public in local environments, the initiative contributes to scientific knowledge, fosters public science literacy through active participation, encourages knowledge sharing across broader social networks, and promotes the development of environmentally friendly behaviours.

Objectives

- To increase public’s scientific knowledge, especially on marine biodiversity and the value of marine park through active participation in field survey and data collection related to fish, hard corals, and sea slugs under the supervision of team leaders trained by expert groups;
- To improve the marine species database for further enhancing management, education and monitoring purposes; and
- To enable early detection of abnormalities in the marine environment, facilitating more in-depth surveys and the implementation of effective management measures.

The 3 Target Taxa Groups

Based on the results of literature review and baseline ecological surveys, three taxa groups were selected for the Programme with the reasons below:

Fish



About 128 species of fish have been recorded in HHWMP. A fish survey, conducted as part of the Programme, not only helps to compile a more updated and complete list of fish species in the marine park but also provides baseline data on the potential recovery process of fish communities following the full implementation of the commercial fishing ban in the marine park since 2022.

Hard Corals

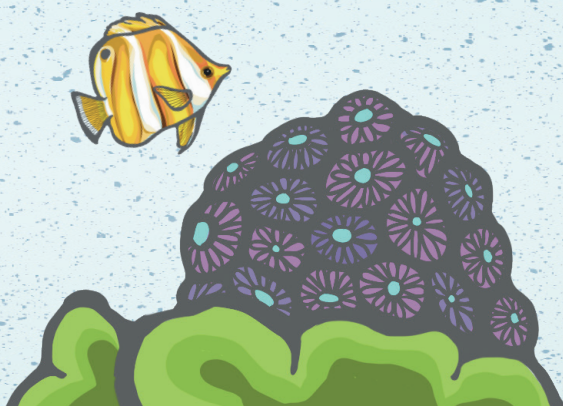


Hoi Ha Wan was designated as a marine park in 1996 due to the rich and diverse coral community present in the bay where 64 species of hard corals (out of 84 species recorded in Hong Kong) have been recorded. Hard corals are seen as the keystone in an ecosystem, being critical in supporting a wide array of marine life through their complex structures. In this Programme, apart from monitoring the coverage and composition of corals, the health monitoring of brain and staghorn corals outplanted on restoration plots were also conducted.

Sea Slugs



Sea slugs are one of the most popular and most photogenic groups of marine invertebrates for divers at artificial reef in HHWMP. However, they are also one of the least studied. A species inventory list can be developed specifically for HHWMP.



The “Train-the-Trainer” Concept

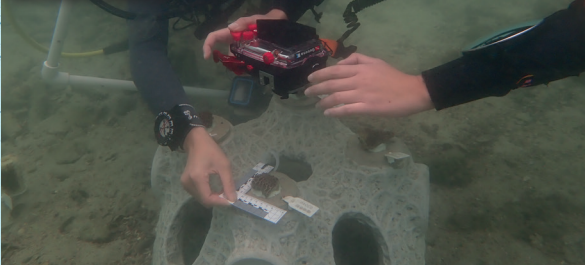
Training was provided to team leaders by expert groups aiming to equip team leaders with advanced scientific knowledge and practical skills to lead the public survey tours on fish, hard corals, and sea slugs.

Training of team leaders by expert groups

Land-based training on species identification and data processing



Field-based training on the implementation of survey protocol and data collection



Expert groups providing explanation to team leaders with the use of field guides

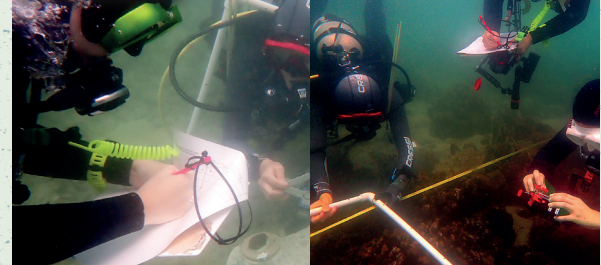


Leading of public survey tours by trained team leaders

Team leaders delivering the survey methodology to citizen scientists



Team leaders leading citizen scientists to carry out the scientific ecological surveys



Team leaders leading citizen scientists to carry out data analysis




3
Expert groups


13
Team leaders


72
Citizen scientists

What Have Been Done?



Stage 1:
Desktop review and
baseline field survey



Stage 2:
Designing survey
protocols for
citizen science
programmes



Stage 3:
Training of team
leaders by expert
groups



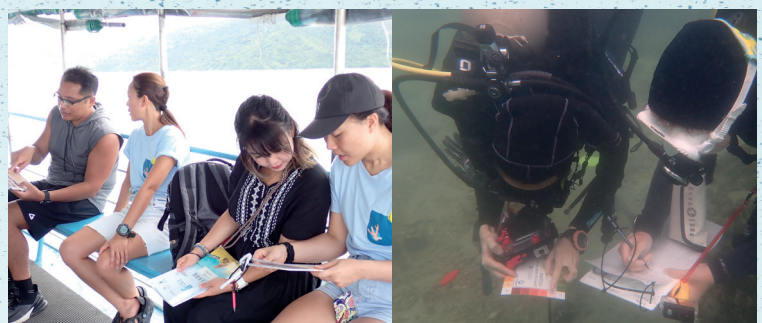
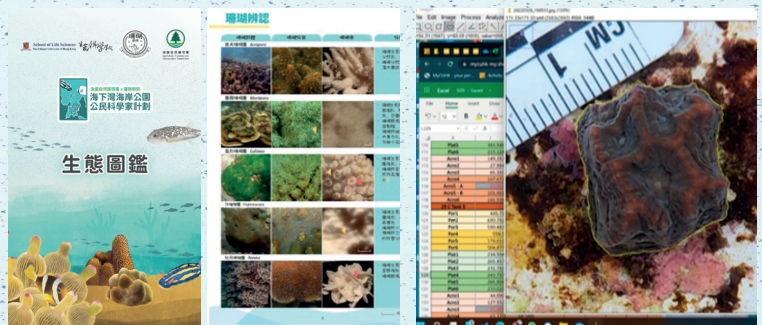
Stage 4:
Citizen Scientist
Survey

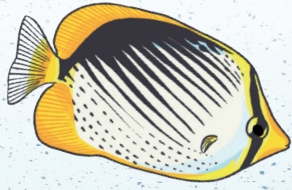


Stage 5:
Public seminar

Did you know?

Corals are animals.
They are made
up of hundreds
and thousands of
individual
animals called
polyps.



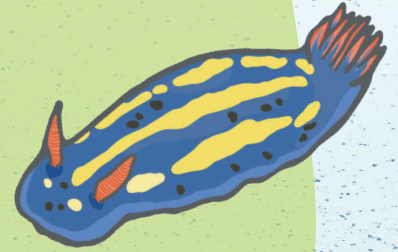


Recent studies suggested that fish could experience a range of emotions including fear, joy, relaxation and playfulness.

Did you know?

Did you know ?

Sea slugs are able to regrow parts of their bodies, such as their tissues, organs and even some parts of their nervous system. This helps them recover from injuries or attacks.



The Survey Results Fish

44

fish species from 21 families were recorded

With

3

survey days

the surveys found

1/3

of the fish species recorded in the past, revealing high potential of finding more fish species in HHWMP

Among them,

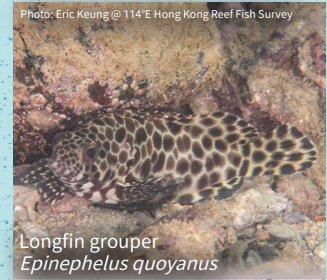
5

species were not recorded in the marine park before in published source

6 species of commercially important fish from 5 families were recorded



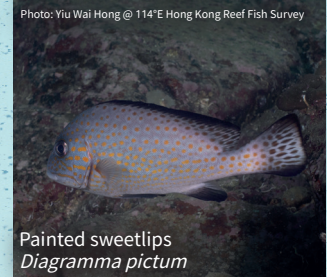
Chocolate hind
Cephalopholis boenak



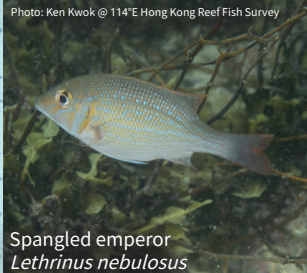
Longfin grouper
Epinephelus quoyanus



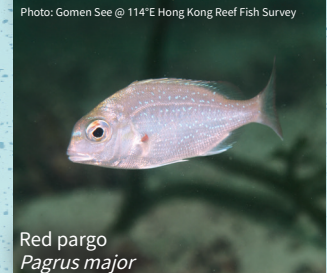
Flathead mullet
Mugil cephalus



Painted sweetlips
Diagramma pictum



Spangled emperor
Lethrinus nebulosus



Red pargo
Pagrus major

The Survey Results

Hard Corals

Coral Composition

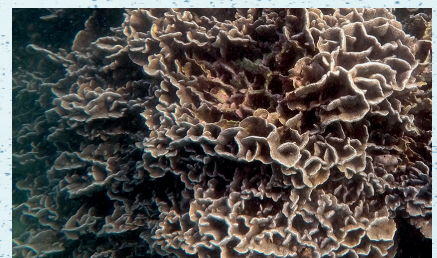
- The survey site, Gruff Head, hosted an abundant and healthy hard coral community, with over 40% of coral coverage
- The top 3 dominant coral genera (percentage indicated the coverage of that coral genus among total coral coverage at that site) are shown below:



Pore coral *Porites*
54.5%



Brain coral *Platygyra*
27.3%



Cactus coral *Pavona*
11.7%

Outplanted Corals

- 48 fragments of brain corals and staghorn corals were outplanted to 6 restoration plots for educational purpose, after 1 year:

95.8%
survivorship

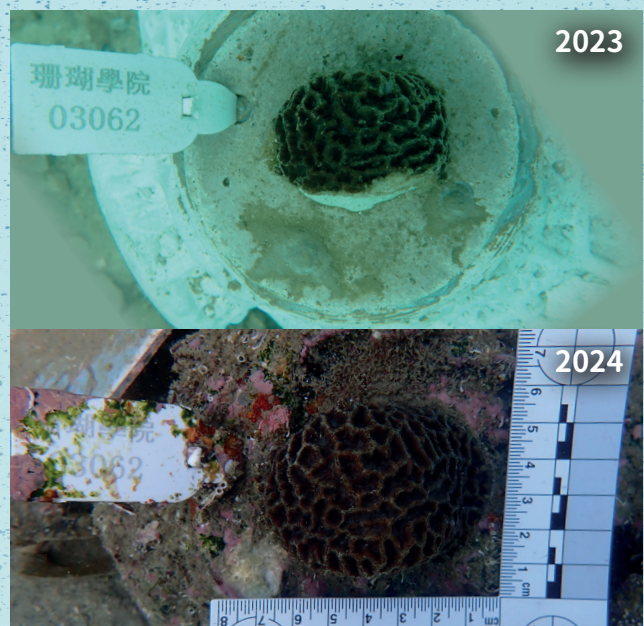
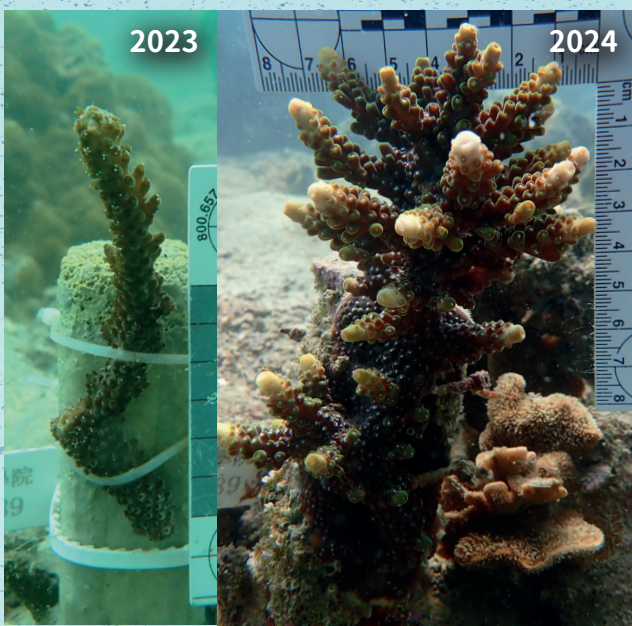


Staghorn corals grew an average of 2.58 cm/year



Brain corals grew an average of 8.35cm²/year

Let's take a look at how fast corals outplanted to reef balls grow in one year:



The Survey Results

Sea Slugs

Sea slug survey was

first

of its kind in HHWMP

9

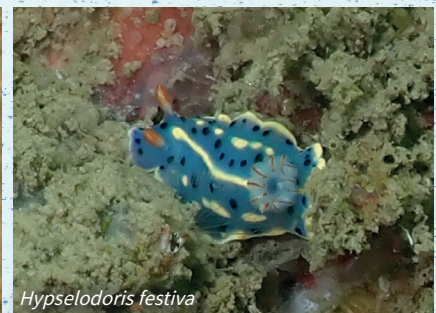
sea slug species from 5 families were recorded at Artificial Reef in the marine park. (Photos arranged in descending order of commonness seen during surveys)



Unidentia aliciae



Phidiana militaris



Hypselodoris festiva



Goniobranchus tumuliferus



Goniobranchus sinensis



Polycera sp.



Dendrodoris krusensternii



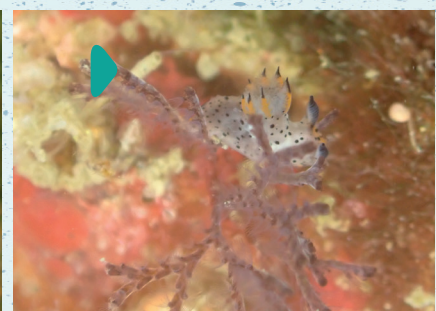
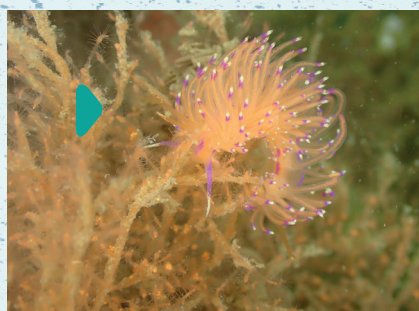
Dendrodoris fumata



Phidiana anulifera

- *Unidentia aliciae* was the most abundant sea slug, with three teams recording more than 100 individuals in their dives.

- 2 species of sea slug *Unidentia aliciae* and *Polycera* sp. were found exclusively on its potential prey in the surveys, which is a type of branching hydroids and a type of branching bryozoan respectively. ▶



Feedback From Citizen Scientists

Citizen scientists were invited to fill in pre- and post-programme questionnaires to assess their change in ocean literacy. Positive change was observed in the following aspects after joining the programme which will help fostering a more environmentally friendly lifestyle:



Attitudes towards learning



Environmental attitude



Environmental concern



Perceived seriousness of environmental problems



Perceived attitude towards research

Insights shared by citizen scientists after joining the activity:

Hoi Ha Wan is home to a wide range of biodiversity, with the shipwreck serving as a habitat for numerous fish and marine species. Marine parks play a crucial role in conserving nature, supporting a significantly higher abundance of biomass compared to other marine areas. Hong Kong's well-managed marine parks are truly commendable and worth appreciating.

Spreading the message to friends to avoid using chemical sunscreen products. When teaching diving, I will emphasize on the importance of maintaining neutral buoyancy in order to avoid damaging corals and disturbing marine life with our fins.

The instructors and team leaders are highly experienced while the objectives of the programme are well-defined and clear.

Good ratio of team leader to citizen scientist in each diving group.

There are still many aspects of Hong Kong's marine environment that remain unexplored. Hopefully, more Hong Kong people will take part in marine research efforts.

Often, divers have a singular goal, such as taking photos to find a specific species of sea slugs. However, this activity effectively leverages the skills and experience of seasoned divers in ecological surveys while maximizing the benefits.

I am extremely satisfied with the arrangement on land and onboard. Although the schedule was rather tight, it was a rewarding experience with meaningful outcomes.

More of this type of activity should be hosted to raise awareness of the general public on the importance and beauty of the ocean in Hong Kong.

About This Featured Story

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Special thanks to the contribution and participation of all expert groups, team leaders and citizen scientists!