

# Ecological Restoration with Oyster Shell Reefs at Sham Wan Restricted Area

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## Overview and Aim

Sham Wan is a unique Site of Special Scientific Interest (SSSI)

Only recorded green sea turtle nesting site in Hong Kong

Restricted from April 1st to October 31st hence unique opportunity for this project

Aims to augment biodiversity and ecosystem functions by installing oyster shell reefs

Increase habitat complexity and provide habitat for species of different trophic levels

Encourage turtle breeding/nesting/foraging activity



## Ecological benefits of oyster reefs

**Improve water quality**, absorbing algae, excess nutrients preventing blooms

7 meters square of Hong Kong oyster reef can filter up to one Olympic swimming pool of water each day (source from HKU)

A single Hong Kong oyster (*Magallana hongkongensis*), can filter up to 30 liters of water per hour (source from HKU)

Habitat and nursery grounds for many native fish, crustacean, and shellfish species

Attachment base for more filter feeders leading to **even better water quality and clarity**

## Social benefit of oyster reefs

Provides habitat to commercially important species of fish, crustaceans and shellfish

Dissipate storm and wave energy, protecting shoreline from erosion

Improves water quality hence improve recreational fishing, boating, diving, or ecotourism

Relieve stress on HK landfills (Cordis Hotel recycled 6.2 tons of oyster shells in 6 months)

### Why just shells?

Around the world, transplanting oyster larvae to establish oyster reefs is common. However, in HK, natural recruitment of oyster larvae is high as a result of extensive oyster farms in the Pearl River Delta. Recycling shells to construct oyster reefs is much more cost-effective and nature-friendly.



## Methodology

Blue dots indicate marked GPS location of 40 oyster shell reefs over 4 trial sites

Half of oyster shell reefs are made of biodegradable hemp mesh bags and the other with stainless steel mesh bags

Yellow dots indicate both ends of control site

Both trial and control sites are 60m in length

Each oyster shell reef is made of 10 bags tied together

Each bag weighs 20kg

Each reef weighs 200kg



## 1<sup>st</sup> & 2<sup>nd</sup> Monitoring

Scuba divers conducted a rapid assessment of highly mobile fauna using video-recording across all sites

Divers also used photo-quadrats at trial sites to record sessile flora and fauna and to determine species coverage using CPCe 4.0

Shells were removed from each reef type and taken to the boat to assess sessile species and cryptic mobile species

## Encouraging preliminary results

- ✓ Oyster shell reefs utilized by marine organisms as shelter, foraging and breeding ground
  - ✓ Important commercial species such as groupers, sweetlips observed
  - ✓ 26 sessile species observed

### Going forward

- ✓ Monitoring will continue and we expect to see increased biodiversity, an increase in abundance and species richness

