

Environmental Permit No. EP-388/2010

Development of a Bathing Beach at Lung Mei, Tai Po

Independent Environmental Checker Verification


Reference Document/Plan

| | |
|--|--|
| Document/Plan to be Certified/ Verified: | 3 rd Post-Translocation Ecological Monitoring Report (at the vicinity of Ting Kok East) |
| Date of Report: | May 2020 |
| Date received by IEC: | 25 June 2021 |

Reference EP Condition / Updated EM&A Manual Requirement

| | |
|---|-----------------|
| Environmental Permit Condition / Updated EM&A Manual Reference | Section 7.2.1.5 |
| The qualified Marine Ecologist shall submit a report with six copies within one month from the completion of each marine ecological monitoring. | |

IEC Verification

| | |
|---|---|
| I hereby verify that the above referenced document/ plan complies with the above referenced condition / section of EP 388/2010 / Updated EM&A Manual | |
| Mr Terence Fong | Date: 28 June 2021 |
| Independent Environmental Checker |  |

Our ref: P:\Projects\0206709 IEC for Lung Mei EM&A\07_ET Submission\32_Marine Fauna Monitoring Report

Our Ref: TCS00874/16/300/L0753

Welcome Construction Co., Ltd.

Flat 01, 19/F, Westley Square,
48 Hoi Yuen Road,
Kwun Tong, Kowloon.

Attn: Mr. William Lam

28 June 2021
By e-mail

Dear Sir,

Re: CEDD Contract No. CV/2012/05 - Bathing Beach at Lung Mei, Tai Po
3rd Post-Translocation Ecological Monitoring Report (at the Ting Kok East)

With reference to the revised 3rd Post-Translocation Ecological Monitoring Report ((at the Ting Kok East), we have no adverse comment on the report. We herewith certify the captioned submission in accordance with Section 7.2 of the Updated EM&A Manual.

Should you have any queries, please feel free to contact the undersigned at Tel: 2959-6059 or Fax: 2959-6079 or E-mail: twtam@fordbusiness.com.

Yours sincerely,
For and on Behalf of
Action-United Environmental Services & Consulting



T. W. Tam
Environmental Team Leader
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CEDD
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Mr. Terence Fong

via email
via email

**Environmental Impact Assessment for Development of a Bathing Beach at
Lung Mei, Tai Po
Environmental Permit No. EP-388/2010**

**3rd Post-Translocation Ecological Monitoring Report (at the Ting Kok East)
(May 2020)**



ECO-ENVIRO CONSULTANTS COMPANY

1 Introduction

- 1.1 In accordance to Section 7.2 of the updated EM & A manual, it is required to conduct environmental monitoring after marine fauna relocation at a six-monthly interval at (i) vicinity site near bathing beach at Lung Mei and (ii) The Reception Site of Ting Kok East until expiry of the Contract Maintenance Period.
- 1.2 Aim of this report is to present post-translocation monitoring objectives, methods, locations and results.

2 Objective

- 2.1 The objectives of the marine ecological monitoring are to collect data for determining whether there is any impact on the marine ecological resources (i) in the vicinity of the Lung Mei intertidal area due to the development of the bathing beach at Lung Mei, and (ii) at the Reception Site of Ting Kok East due to relocation of the target marine fauna.
- 2.2 This 3rd Marine Fauna Monitoring Report covers the marine ecological surveys conducted at the Reception Site at Ting Kok East during the construction phase.

3 Scope of Impact Marine Ecological Survey at Ting Kok East

- Intertidal quantitative transect survey at one location
- Intertidal fish survey at one location
- Semi-quantitative Crustacean Survey at one location

4 Methodology

4.1 Intertidal quantitative transect survey

- 4.1.1 The reception site at Ting Kok East for fauna relocation from the project site was identified and recommended during EIA stage. The project specification required that the captured target marine fauna from the project site should be released to the reception area with similar habitat and shore elevation where they are captured. The target fauna will be captured from the full tidal range at the project site. Therefore inter-tidal habitats at representative three tidal levels for full tidal range at Ting Kok East are selected to be sampled to collect data to characterize baseline condition.
- 4.1.2 The intertidal quantitative transect survey was undertaken during daytime low tide (<1mCD), Three 30-m horizontal transects parallel to the shoreline was haphazardly deployed at each of the three shore heights (0.5 mCD, 1.0 mCD and 1.5 mCD) areas where most of the intertidal fauna inhabit) within the intertidal and shallow subtidal zones. Five 0.25m x 0.25m quadrats was placed randomly along each transect to assess the abundance and diversity of marine fauna (total sample number = 3 shore heights x 3 transects x 5 quadrats = 45). For each quadrat, a photographic record was obtained, and the abundance of sessile fauna (e.g. barnacles and rock oysters, expressed as percentage planar cover of the quadrat) would be estimated. Surface sediment (approximate volume = 25 cm x 25cm x 5 cm =3,125 cm³) was

wet-sieved in situ (mesh size of 2 mm) to obtain all mobile organisms living on or in the surface sediment within each quadrat ('epifauna', including underside of the boulders/cobbles). Epifauna was identified to species level where possible and their abundance recorded to calculate epifaunal abundance per quadrat for comparison of abundance during subsequent ecological monitoring. Average percentage cover of each species was calculated by cumulated cover divided by number of quadrat.

4.1.3 All crustacean species observed and their relative abundance along each transect was also recorded during the transect surveys (semi-quantitative crustacean surveys) along 1 m belt area on each side of the transect line.

4.1.4 Sampling transects are shown in **Appendix I**. The selected marine ecological monitoring/survey site is the reception site for fauna relocation programme at the bathing beach construction site.

4.2 Semi-quantitative crustacean survey

4.2.1 All crustacean species observed and their relative abundance along each transect (0.5m each side) shall also be recorded during the transect surveys.

4.3 Intertidal fish survey

4.3.1 The intertidal fish survey was involve field observation, photographic record and drop-trapping during daytime low tide (tidal level <1.5 mCD) to examine the diversity and abundance of fish species. One-metre-square drop-traps was deployed by two persons, each holding the trap above the water surface when the water depth is about 0.2-0.5 m, and then dropped onto the sediment surface to capture intertidal fish. All intertidal fish captured using this method was recorded. At least 10 drop-trap samples was collected during each survey. All captured intertidal fish was identified to species level wherever possible and returned to their natural habitats after identification works as far as practicable. Intertidal fish survey area is given in **Appendix I**.

4.4 Shannon diversity index (H) and Pielou's evenness index (J)

4.4.1 The Shannon diversity index (H) is another index that is commonly used to characterize species diversity in a community. Shannon's index accounts for both abundance and evenness of the species present. The proportion of species i relative to the total number of species (p_i) is calculated, and then multiplied by the natural logarithm of this proportion ($\ln p_i$). The resulting product is summed across species, and multiplied by -1:

$$H = -\sum_{i=1}^S p_i \ln p_i$$

The evenness of a community can be represented by Pielou's evenness index:

$$J = H' / H_{\max} = H' / \ln S$$

Where H' is the number derived from the Shannon diversity index and H'_{\max} is the maximum possible value of H' , equal to:

$$H_{\max} = - \sum_{i=1}^S \frac{1}{S} \ln \frac{1}{S} = \ln S$$

J is constrained between 0 and 1. The less evenness in communities between the species (and the presence of a dominant species), the lower J is.

5 Survey Results

Quantitative quadrats survey results

5.1 Quantitative quadrat surveys were conducted at Ting Kok East on 29 July 2019. A total of 45 quadrats were surveyed from three shore heights (0.5 mCD, 1.0 mCD and 1.5 mCD). The representative photos of survey transect and quadrats were presented in **Appendix IIa**. The survey results of quantitative quadrat survey were summarized in **Appendix III**. A total of 21 epifauna species was recorded, in which Mollusca made up the majority (71%) of the phylum composition (**Table.1**).

Table.1 Total Number of Recorded Epifauna Species in Each Phylum

| Phylum/Subphylum | Number of Species | |
|----------------------|-------------------|-------------------------------------|
| | Baseline (Jun-17) | 3 rd Monitoring (Jul-19) |
| Mollusca | 17 | 15 |
| Chordata | 2 | 1 |
| Annelida | 2 | 2 |
| Arthropoda | 5 | 2 |
| Sipuncula | 1 | 0 |
| Polyplacophora | 1 | 1 |
| Total No. of Species | 28 | 21 |

5.2 Similar to the baseline, the highest abundance of epifauna was recorded at 1 mCD, in which total of 637 individuals of epifauna were recorded, followed by 1.5 mCD (353 individuals) and 0.5 mCD (233 individuals) (**Table 2**). The most abundant species at 0.5 mCD, 1 mCD and 1.5 mCD were sea snails *Cerithidea cingulata*, sandy shore snail *Batillaria zonalis*, and the crowned turban shell *Lunella coronata* respectively. The most abundant species were all under taxonomic group of Mollusca.

Table 2 No. of Mobile Animal Recorded during Baseline (Jun-17) and 3rd Monitoring (Jul-19)

| Tidal Level | No. of mobile animal |
|-------------|----------------------|
|-------------|----------------------|

| | Baseline (Jun-17) | 3rd Monitoring (Jul-19) |
|---------------|--------------------------|---|
| 0.5mCD | 131 | 233 |
| 1.0mCD | 492 | 627 |
| 1.5mCD | 213 | 353 |

5.3 The mean number of species per quadrat for mobile fauna and sessile fauna at three tidal levels were summarized in the **Table 3**. When compare to baseline survey result, the July 2019 monitoring showed a higher number of species of mobile fauna at the 0.5 m CD rather than 1.0 m CD and sessile organisms were both recorded at the 1.0 mCD, which are 8.73 ± 1.91 and 1.53 ± 0.74 respectively. The overall mean of species number of mobile fauna and sessile organisms at Ting Kok East were 8.16 ± 2.14 and 1.20 ± 0.76 respectively.

Table 3. The Mean Number of Epifaunal Species per Quadrat

| | Intertidal Levele | | | | | | | |
|------------------------------------|--------------------------|---|------------------------|---|------------------------|---|------------------------|---|
| | 0.5 mCD | | 1.0 m CD | | 1.5 m CD | | Overall | |
| | Baseline Jul-17 | 3rd Monitoring Jul-19 | Baseline Jul-17 | 3rd Monitoring Jul-19 | Baseline Jul-17 | 3rd Monitoring Jul-19 | Baseline Jul-17 | 3rd Monitoring Jul-19 |
| Mobile Fauna (no. of species) | 2.80±1.66 | 8.73±1.91 | 4.53±1.25 | 8.13±2.00 | 3.13±1.25 | 7.60±2.47 | 3.49±1.56 | 8.16±2.14 |
| Sessile Organisms (no. of species) | 1.40±0.74 | 1.47±0.64 | 1.53±0.80 | 1.53±0.74 | 1.13±0.64 | 0.60±0.51 | 1.36±0.68 | 1.20±0.76 |

5.4 Species richness, diversity and evenness indices are inter-related. A diversity index integrates two components: the total number of species (d) and the distribution of individuals among species, into a single number (H). H' is usually high (e.g. >3 or 4) in environmentally undisturbed benthic communities, and low (e.g. <1) in highly disturbed communities.

5.5 Based on the calculation (excluding sessile organism), the species diversity at 0.5 mCD (H=2.54) was higher than 1.0 mCD (H=2.03) and 1.5 mCD (H=2.35). The overall species diversity (H) of epifauna was 2.57. The species evenness (J) was similar among three tidal levels ranging from 0.79 to 0.95, and the overall species evenness was 0.94. The calculated results were summarized in **Table 4**. Both baseline and July 2019 monitoring surveys showed medium (between 1-3) species diversity and evenness (**Table 4**). During the July 2019, both species diversity and evenness showered a higher number when compared with the baseline results (**Table 4**).

Table 4. Species Diversity and Evenness

| | | Tidal Level | | | |
|---|-------------------------------------|-------------|---------|---------|---------|
| | | 0.5 mCD | 1.0 mCD | 1.5 mCD | Overall |
| H | Baseline (Jul-17) | 2.01 | 2.38 | 1.77 | 2.00 |
| | 3 rd Monitoring (Jul-19) | 2.54 | 2.03 | 2.35 | 2.57 |
| J | Baseline (Jul-17) | 0.74 | 0.90 | 0.71 | 0.64 |
| | 3 rd Monitoring (Jul-19) | 0.94 | 0.79 | 0.95 | 0.94 |

Semi-quantitative crustacean survey results

5.6 Semi-quantitative crustacean surveys were undertaken to record all crustaceans along 1 m belt area on each side of the transect line, shown as **Table 5**. Similar to baseline, the highest number of species recorded was at 0.5 mCD (Baseline:17, Jan-19:11), followed by 1.0 mCD (Baseline:13, Jan-19:8) and 1.5 mCD (Baseline:5, Jan-19:7). The relative abundance of all crustaceans are shown in Table 6. The recorded species belong to common species (with no conservation interest). During July 2019 monitoring, the intertidal levels of 0.5 mCD and 1.0 m CD showed a lower no. of Crustacea species than the baseline result and intertidal level 1.5 m CD showed a higher no. of Crustacea species than the baseline result.

Table 5. Total Number of Crustacean Species Recorded at Different Tidal Levels from Semi-quantitative Survey

| | 0.5 mCD | | 1.0 mCD | | 1.5 mCD | |
|----------------------------------|-------------------|-----------------------------------|-------------------|-----------------------------------|-------------------|-----------------------------------|
| | Baseline (Jul-17) | 3 rd Monitoring Jul-19 | Baseline (Jul-17) | 3 rd Monitoring Jul-19 | Baseline (Jul-17) | 3 rd Monitoring Jul-19 |
| No. of Crustacean Species | 17 | 11 | 13 | 8 | 5 | 7 |

Table 6 Total Number of Crustacean Species and their Abundance Recorded from Semi-quantitative Survey

| Crustacean Species | Conservation Status | Abundance | | | | | | | | | | | | | | | | | |
|---------------------------------|---------------------|---|--------|----------|--------|----------|--------|-------------------------------------|--------|----------|--------|----------|--------|--|--------|----------|--------|----------|--------|
| | | 0.5m above mCD (Relative low tidal level) | | | | | | 1.0m above mCD (Medium tidal level) | | | | | | 1.5m above mCD (Relative high tidal level) | | | | | |
| | | 1 | | 2 | | 3 | | 1 | | 2 | | 3 | | 1 | | 2 | | 3 | |
| | | Baseline | Jul-19 | Baseline | Jul-19 | Baseline | Jul-19 | Baseline | Jul-19 | Baseline | Jul-19 | Baseline | Jul-19 | Baseline | Jul-19 | Baseline | Jul-19 | Baseline | Jul-19 |
| <i>Ligia exotica</i> | - | | | | | | | | | | | + | + | + | + | | | + | + |
| <i>Alpheus brevicristatus</i> | - | ++ | + | | + | ++ | + | + | | | | + | + | | | + | + | | |
| <i>Alpheus lobidens</i> | - | ++ | + | | + | | | + | + | ++ | + | + | | | | | | | |
| <i>Clibanarius longitarsus</i> | - | + | | + | | + | + | + | | + | + | | | | | | | | |
| <i>Metopograpsus frontalis</i> | - | + | + | + | + | + | | ++ | + | + | | + | + | + | + | - | | + | + |
| <i>Palaeman serrifer</i> | - | + | | + | | + | + | + | | + | | + | | | | | | | |
| <i>Pyrhila pisum</i> | - | | | + | + | | | | | | | | | | | | | | |
| <i>Etisus laevimanus</i> | - | | | + | | + | + | | | | | + | | | | | | | |
| <i>Gaetice depressus</i> | - | | | + | | | | | | + | + | | | + | + | + | + | | |
| <i>Leptodius exaratus</i> | - | | | ++ | + | + | + | + | + | + | + | | | | | | | | |
| <i>Lysmata wurdemanni</i> | - | + | + | + | + | | | | | | | | | | | | | | |
| <i>Petrolisthes boscii</i> | - | + | | | | | | | | | | | | | | | | | |
| <i>Philyra pisum</i> | - | | | + | | + | | | | + | + | | + | | | + | + | | |
| <i>Portunus pelagicus</i> | - | | | + | + | | | | | | | | | | | | | | |
| <i>Thalamita danae Stimpson</i> | - | | | + | | + | | | | | | | | | | | | | |
| <i>Perisesarma bidens</i> | - | | | + | | | | | | | | + | | | | | | | |

| | | | | | | | | | | | | | | | | | | |
|--------------------------|---|--|--|----|---|---|---|--|--|--|--|---|--|--|---|---|---|---|
| <i>Thalamita crenata</i> | - | | | ++ | + | | + | | | | | + | | | | | + | + |
| <i>Amphipada sp.</i> | - | | | | | + | | | | | | + | | | | | | |
| <i>Scopimera globosa</i> | - | | | | | | | | | | | | | | + | + | | |

NOTE: "+" Occur "++" Common "+++" Abundant

* Species listed as "Lowest Concern" in IUCN Red List was not shown in the Conservation Status Column

Inter-tidal fish survey results

5.7 The inter-tidal fish survey was conducted at the area indicated in **Appendix I**. From the survey, a total of 7 species were recorded during the baseline survey and only 1 species (*Bathygobius fuscus*) were recorded during July 19 survey. The recorded species were low in abundance of 0.1 individual per square meter. Other than the recorded fish, dusky frillgoby, crescent-banded grunter and chameleon goby were recorded inside the survey area. The list of the recorded species and their abundance were shown in **Table 7**. The recorded fish species belong to common species (with no conservation interest). The survey results were shown in **Appendix III**.

Table 7. Average Abundance of Inter-tidal Fish Recorded from 10 drop-traps

| Common Name | Species | Abundance per m ² | |
|---------------------------|------------------------------------|------------------------------|-----------------------------------|
| | | Baseline (Jul-17) | 3 rd Monitoring Jul-19 |
| Dusky frillgoby | <i>Bathygobius fuscus</i> | 0.3 | 0.1 |
| Target shrimp goby | <i>Cryptocentrus strigilliceus</i> | 0.1 | 0 |
| Fan-bellied leatherjacket | <i>Monacanthus chinensis</i> | 0.1 | 0 |
| Pointed goatfish | <i>Parupeneus biaculeatus</i> | 0.1 | 0 |
| Crescent-banded grunter | <i>Therapon jarbua</i> | 0.4 | 0 |
| Tridentiger bifasciatus | <i>Tridentiger bifasciatus</i> | 0.2 | 0 |
| Chameleon goby | <i>Tridentiger trigonocephalus</i> | 0.1 | 0 |

Note: All the recorded fishes are common and listed as Least Concern in IUCN Red List except *Parupeneus biaculeatus* and *Tridentiger trigonocephalus* which were not assessed.

6 Discussion and Summary

6.1 A total of 21 epifauna species were recorded from the quantitative quadrat survey. The highest abundance was recorded at 1mCD, where 637 individuals of epifauna were recorded. The overall species diversity (H) and species evenness (J) were 2.59 and 0.89 respectively. Both baseline and July 2019 monitoring surveys showed medium (between 1-3) species diversity and evenness (**Table 4**).

6.2 For the semi-quantitative crustacean survey, a total of 13 crustacean species were recorded from 9 transects at 3 different shore heights. The recorded species comprised mostly common

species.

6.3 For the inter-tidal fish survey, no fish was recorded.

6.4 In conclusion, since the species diversity and evenness showed no significant differences or similar trends between baseline and the 3rd monitoring survey except no fish were recorded during the intertidal survey.

6.5 No deterioration in the general condition of the habitat was observed. No deterioration of the animal community was observed in the ecological monitoring results when compared with the baseline ecological monitoring results.

Appendix I Figure








Figure 1. Survey locations at Ting Kok East.

Appendix IIa Photos – Survey Transects and Quadrats






Survey Location: Ting Kok East

Transect 1 (A-C): 0.5 m above mCD (relative low tidal level)


Transect 1A

| | |
|---|---|
|  |  |
| Quadrat 1 | Quadrat 2 |
|  |  |
| Quadrat 3 | Quadrat 4 |
|  | |
| Quadrat 5 | |

Transect 1B

| | |
|---|--|
|  |  |
| <p>Quadrat 1</p> | <p>Quadrat 2</p> |
|  |  |
| <p>Quadrat 3</p> | <p>Quadrat 4</p> |
|  | |
| <p>Quadrat 5</p> | |

Transect 1C

| | |
|---|--|
|  |  |
| <p>Quadrat 1</p> | <p>Quadrat 2</p> |



Quadrat 3








Quadrat 4








Quadrat 5

Transect 2 (A-C): 1 m above mCD (medium tidal level)



Transect 2A

| | |
|---|---|
|  |  |
| Quadrat 1 | Quadrat 2 |
|  |  |
| Quadrat 3 | Quadrat 4 |
|  | |
| Quadrat 5 | |

Transect 2B

| | |
|---|--|
|  |  |
| <p>Quadrat 1</p> | <p>Quadrat 2</p> |
|  |  |
| <p>Quadrat 3</p> | <p>Quadrat 4</p> |
|  | |
| <p>Quadrat 5</p> | |

Transect 2C

| | |
|---|--|
|  |  |
| <p>Quadrat 1</p> | <p>Quadrat 2</p> |



Quadrat 3








Quadrat 4



Quadrat 5

Transect 3 (A-C): 1.5 m above mCD (relative high tidal level)

Transect 3A




| | |
|---|---|
|  |  |
| Quadrat 1 | Quadrat 2 |
|  |  |
| Quadrat 3 | Quadrat 4 |
|  | |
| Quadrat 5 | |

Transect 3B





| | |
|---|--|
|  |  |
| <p>Quadrat 1</p> | <p>Quadrat 2</p> |
|  |  |
| <p>Quadrat 3</p> | <p>Quadrat 4</p> |
|  | |
| <p>Quadrat 5</p> | |

Transect 3C

| | |
|---|--|
|  |  |
| <p>Quadrat 1</p> | <p>Quadrat 2</p> |

| | |
|---|--|
|  |  |
| <p>Quadrat 3</p> | <p>Quadrat 4</p> |
|  | |
| <p>Quadrat 5</p> | |

Appendix IIb – Representative Photographs of Ting Kok East Survey

| | |
|---|--|
|  |  |
| <p>Quadrat Survey</p> | |
|  |  |

Sieving the Sediment Sample



Gafrarium sp.



Portunus pelagicus



Batillaria zonalis



Lunella coronata



Various mollusks in the tray



Saccostrea cucullata

Appendix III Survey Results

Ting Kok Quantitative Quadrat Survey Result (0.5mCD)

| Transect | | | | 1 | | | | | 2 | | | | | 3 | | | | |
|-------------------|-------------------------|--------------------------------|---------------------|--------------------|-----|-----|-----|-----|-----|-----|-----|----|----|----|-----|-----|----|-----|
| Quadrat | | | | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| | Phylum | Scientific Name | Conversation status | Relative Abundance | | | | | | | | | | | | | | |
| Mobile Fauna | Mollusca | <i>Batillaria zonalis</i> | - | 2 | 2 | 1 | 3 | 2 | 2 | - | 2 | - | 1 | 2 | 2 | 3 | - | 1 |
| | | <i>Batillaria multiformis</i> | - | 2 | 3 | 1 | 1 | - | - | 2 | 1 | 2 | 2 | 3 | - | 3 | 2 | 1 |
| | | <i>Cerithidea cingulata</i> | - | 2 | 3 | 5 | 3 | 2 | 4 | 4 | - | 3 | 1 | 2 | 3 | 2 | - | - |
| | | <i>Isognomon isognomum</i> | - | 2 | - | 2 | 1 | 2 | 2 | 3 | - | 2 | 3 | 2 | 3 | 4 | 1 | 2 |
| | | <i>Lunella coronata</i> | - | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 2 | - | 2 | - | 2 |
| | | <i>Gafrarium pectinatum</i> | - | 2 | 3 | 2 | 2 | 1 | 4 | 4 | 2 | - | - | - | 2 | 1 | - | - |
| | | <i>Asaphis dichotoma</i> | - | - | - | 2 | 1 | 2 | - | - | 2 | 1 | 2 | 3 | - | 1 | 2 | - |
| | | <i>Cronia margariticola</i> | - | 1 | - | - | 1 | 1 | 2 | 2 | 2 | - | - | - | 1 | - | 1 | - |
| | | <i>Barbatia virescens</i> | - | - | - | 1 | 1 | - | 2 | - | 1 | - | - | - | - | - | - | - |
| | | <i>Brachidontes variabilis</i> | - | 3 | 1 | 2 | - | - | 2 | 1 | 1 | - | - | 2 | 1 | - | - | 1 |
| | | <i>Scapharca cornea</i> | - | 1 | 2 | 1 | 2 | 1 | - | 2 | - | 2 | - | - | - | - | 1 | - |
| | Arthropoda | <i>Alpheus lobidens</i> | - | - | 1 | 2 | - | 1 | - | - | - | 2 | 1 | 1 | - | - | - | 1 |
| | | <i>Paguroidea sp.</i> | - | 2 | 1 | - | - | - | 2 | 1 | - | 1 | 2 | - | - | - | - | |
| | Chordata | <i>Bathygobius fuscus</i> | - | 1 | - | - | - | - | - | 2 | 1 | - | - | - | - | - | - | 2 |
| Sipuncula | <i>Sipunculus nudus</i> | - | - | 1 | - | 1 | - | - | 1 | - | - | - | - | - | - | - | | |
| Sessile Organisms | Mollusca | <i>Saccostrea cucullata</i> | - | 15% | 20% | 30% | 35% | 35% | 24% | 15% | 10% | 5% | 5% | 5% | 15% | 10% | 5% | 15% |
| | Arthropoda | <i>Amphibalanus amphitrite</i> | - | - | 1% | - | - | - | - | - | - | - | - | - | - | 1% | - | 1% |
| | Annelida | <i>Serpulorbis imbricatus</i> | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Chordata | <i>Styela plicata</i> | - | - | - | - | - | 1% | - | - | - | - | 2% | - | 1% | 1% | - | - |

Ting Kok Quantitative Quadrat Survey Result (1.0mCD)

| Transect | | | | 1 | | | | | 2 | | | | | 3 | | | | |
|--------------------------|---------------------------|---------------------------------|---------------------|--------------------|----|----|----|----|----|-----|-----|-----|-----|-----|----|----|----|----|
| Quadrat | | | | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| | Phylum | Scientific Name | Conversation status | Relative Abundance | | | | | | | | | | | | | | |
| Mobile Fauna | Mollusca | <i>Batillaria zonalis</i> | - | 10 | 22 | 23 | 15 | 18 | 10 | 11 | 7 | 3 | 17 | 21 | 10 | 5 | 3 | 12 |
| | | <i>Batillaria multiformis</i> | - | 3 | 12 | 15 | 6 | 7 | 11 | 7 | - | 21 | 22 | 17 | 15 | 17 | 9 | 14 |
| | | <i>Cerithidea cingulata</i> | - | 2 | 1 | 2 | 3 | 5 | 8 | 2 | - | 2 | - | 6 | - | 3 | 2 | 4 |
| | | <i>Cerithidea djadjariensis</i> | - | 3 | 5 | 7 | 8 | 1 | 7 | 4 | 8 | 3 | - | - | 3 | 4 | 2 | 6 |
| | | <i>Clithon oualaniensis</i> | - | - | 4 | 7 | 4 | - | - | - | 4 | - | - | 3 | - | - | - | 1 |
| | | <i>Lunella coronata</i> | - | 1 | 2 | 5 | 2 | 6 | - | - | - | - | 2 | 3 | 1 | 1 | - | 1 |
| | | <i>Gafrarium pectinatum</i> | - | - | 1 | - | 2 | 1 | - | - | 3 | 4 | - | - | - | - | 2 | - |
| | | <i>Asaphis dichotoma</i> | - | - | 1 | 1 | 1 | 2 | 3 | 2 | - | - | 3 | 5 | - | - | 1 | - |
| | | <i>Tegillarca granosa</i> | - | 1 | 2 | 3 | 2 | - | - | - | 2 | 3 | 1 | - | - | 2 | 2 | - |
| | | <i>Scapharca cornea</i> | - | 4 | 1 | 2 | - | - | 2 | - | 2 | 2 | - | 3 | - | 2 | 1 | - |
| | | <i>Cellana grata</i> | - | - | 1 | 2 | - | 2 | - | - | 1 | 2 | - | - | 1 | - | - | 2 |
| | | <i>Brachidontes variabilis</i> | - | - | - | - | 3 | 4 | 2 | 4 | - | - | 2 | - | 5 | - | 3 | 1 |
| Annelida | <i>Dendronereides sp.</i> | - | 1 | 2 | - | - | 2 | - | - | - | - | - | 1 | 2 | - | 3 | 1 | |
| Sessile Organisms | Mollusca | <i>Saccostrea cucullata</i> | - | 5% | 3% | 5% | 3% | 5% | 5% | 10% | 15% | 15% | 20% | 10% | 6% | 5% | 5% | 5% |
| | Arthropoda | <i>Amphibalanus amphitrite</i> | - | - | - | - | - | 2% | 2% | - | - | - | - | 5% | - | - | 5% | - |
| | Polyplacophora | <i>Acanthopleura japonica</i> | - | - | - | - | 3% | - | 1% | - | - | - | - | - | - | - | - | - |
| | Annelida | <i>Serpulorbis imbricatus</i> | - | - | - | - | - | - | - | 2% | - | - | - | - | - | - | 1% | - |
| | Chordata | <i>Styela plicata</i> | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Ting Kok Quantitative Quadrat Survey Result (1.5mCD)

| Transect | | | | 1 | | | | | 2 | | | | | 3 | | | | |
|-------------------|---------------------------|--------------------------------|---------------------|--------------------|---|----|----|----|---|----|----|---|---|----|----|----|----|----|
| Quadrat | | | | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| | Phylum | Scientific Name | Conversation status | Relative Abundance | | | | | | | | | | | | | | |
| Mobile Fauna | Mollusca | <i>Batillaria zonalis</i> | - | 2 | 1 | 2 | 2 | 3 | 4 | - | - | 3 | 4 | 2 | 1 | - | 1 | 2 |
| | | <i>Batillaria multiformis</i> | - | 6 | 4 | 3 | 11 | 5 | 6 | 3 | - | 5 | - | 3 | 6 | 2 | - | 7 |
| | | <i>Cerithidea cingulata</i> | - | 2 | 3 | 1 | 3 | 5 | 8 | - | 4 | - | 4 | - | - | 3 | - | 2 |
| | | <i>Lunella coronata</i> | - | - | 9 | 6 | 7 | 3 | 2 | 5 | 6 | - | - | 3 | 4 | - | 3 | 6 |
| | | <i>Gafrarium pectinatum</i> | - | - | 3 | 2 | 4 | 2 | 3 | 6 | - | - | 3 | 5 | 3 | - | 3 | 6 |
| | | <i>Monodonta labio</i> | - | 1 | 1 | 2 | 2 | - | - | 4 | 3 | 5 | - | 3 | - | - | - | - |
| | | <i>Cellana grata</i> | - | - | 2 | 4 | - | - | 3 | 3 | - | - | 2 | - | 2 | 4 | - | 2 |
| | | <i>Asaphis dichotoma</i> | - | - | - | - | 2 | 2 | 1 | - | - | 1 | - | - | 2 | - | - | 2 |
| | | <i>Brachidontes variabilis</i> | - | 2 | 1 | 3 | 3 | 2 | 4 | 2 | - | - | - | 1 | 2 | 2 | 4 | 2 |
| | Arthropoda | <i>Metopograpsus frontalis</i> | - | - | - | 3 | 5 | 7 | 3 | - | - | 2 | - | 1 | 1 | - | 1 | 6 |
| | | <i>Thalamita crenata</i> | - | - | 2 | 1 | - | - | 2 | - | 3 | 2 | - | - | 2 | - | 1 | - |
| Annelida | <i>Dendronereides sp.</i> | - | - | - | 1 | 2 | 3 | - | - | 3 | - | - | - | 2 | 1 | - | 1 | |
| Sessile Organisms | Mollusca | <i>Saccostrea cucullata</i> | - | - | - | 5% | - | 5% | - | 5% | - | - | - | 5% | - | 5% | 5% | 3% |
| | Arthropoda | <i>Amphibalanus amphitrite</i> | - | - | - | - | - | - | - | - | 1% | - | - | - | 1% | - | - | - |
| | Annelida | <i>Serpulorbis imbricatus</i> | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |

Ting Kok Inter-tidal fish survey results

| | Net Drop Replicates | | | | | | | | | |
|--|---------------------|---|---|---|---|---|---|---|---|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Species | Abundance | | | | | | | | | |
| <i>Bathygobius fuscus</i> | | | | | | | 1 | | | |
| <i>Cryptocentrus strigiliceps</i> | | | | | | | | | | |
| <i>Monacanthus chinensis</i> | | | | | | | | | | |
| <i>Parupeneus biaculeatus</i> | | | | | | | | | | |
| <i>Therapon jarbua</i> | | | | | | | | | | |
| <i>Tridentiger bifasciatus</i> | | | | | | | | | | |
| <i>Tridentiger trigonocephalus</i> | | | | | | | | | | |
| All the recorded fishes are common and listed as Least Concern in IUCN Red List except <i>Parupeneus biaculeatus</i> and <i>Tridentiger trigonocephalus</i> which were not assessed. | | | | | | | | | | |

The End