土木工程拓展署
Civil Engineering and Development Department

ERM

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:	First 7 Days Seahorse Post-Translocation Monitoring Report
Date of Report:	21 June 2021
Date received by IEC:	22 June 2021

Reference EP Condition / Updated EM&A Manual Requirement

~~Environmental Permit Condition~~ / Updated EM&A Manual Reference Section 7.2.3.9

After translocation is completed, the reception site shall be monitored regularly by the qualified Fish Specialist over a period of one year, following the same survey methodology for the pre-translocation monitoring.

The Post-translocation Monitoring Report shall be submitted monthly which shall present findings of all seahorse surveys undertaken in the reporting month. Each monthly Post-translocation Monitoring Report shall be submitted within two weeks of completion of the last seahorse survey in the reporting month.

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: 23 June 2021

Independent Environmental Checker

Our ref: P:\Projects\0206709 IEC for Lung Mei EM&A\07_ET Submission\40_Seahorse Post Translocation Report 1st week-8th month\20210622

Our Ref: TCS00874/16/300/L0746

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

Attn: Mr. William Lam

22 June 2021
By e-mail

Dear Sir,

Re: CEDD Contract No. CV/2012/05 - Bathing Beach at Lung Mei, Tai Po
First Seven Days Seahorse Post-Translocation Report

With reference to the revised First Seven Days Seahorse Post-Translocation Report dated 21 June 2021, we have no adverse comment on the revised report. We herewith certify the captioned submission in accordance with Section 7.2.3.9 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
TW/nh

CEDD	Mr. K F Chan	via email
ERM	Mr. Terence Fong	via email

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

REPORT
FIRST 7 DAYS SEAHORSE POST-TRANSLOCATION MONITORING

ECO-ENVIRO CONSULTANTS COMPANY
January 2018

Revised on 21 June 2021

Table of Contents

Tables, Figures and Appendixes

1. Introduction

1.1 The ex-Provisional Regional Council (ex-PRC) considered that one swimming pool complex in Tai Po was insufficient and hence suggested developing a bathing beach at Lung Mei, Tai Po. Therefore, on 12 May 1998, the Culture, Recreation and Sports Committee of ex-PRC approved funding for the Architectural Services Department (ArchSD) to study the feasibility of developing an artificial beach at Lung Mei. The Feasibility Study, which commenced in December 1999 and completed in mid-2001, concluded that it was technically viable to construct a bathing beach at Lung Mei, Tai Po.

1.2 There is no beach facility in the east region of the New Territories, except in the Sai Kung District, which is very far from Tai Po District. Moreover, the existing swimming facility in the Tai Po areas could not satisfy the demand for a bathing beach. Therefore, the public has been requesting repeatedly to the LCSD for a beach development in the Tai Po District.

1.3 In light of the above, the Tai Po District Council (TPDC) strongly requested for the development of a bathing beach at Lung Mei and members of the TPDC urged for early implementation of the Project. In a Legislative Council case conference on 20 April 2004, Members requested the Government to accord priority to this Project.

1.4 The Project will involve the construction of a 200m long beach with two groynes, which includes dredging and sandfilling. Translocation of marine animals including seahorse *Hippocampus kuda* within the dredging and sandfilling will be required before the commencement of any construction work.

1.5 According to the updated EM&A manual of "Development of a Bathing Beach at Lung Mei, Tai Po Environmental, Drainage and Traffic Impact Assessments – Investigation – CE 59/2005 (EP)", Seahorse translocation work was required to be conducted and it was performed on 17 to 22 January 2018. Followed by successful seahorse translocation work, post-translocation monitoring was started according the approved method statement (Seahorse Translocation Plan (Version 1, 11 January 2018) refers). This report represents the findings of the first 7 days seahorse post-translocation monitoring work conducted at Ting Kok East reception site.

2. Methodology

2.1 Followed by successfully translocated two female seahorses from Lung Mei to Ting Kok East, a 7 days post-translocation monitoring was conducted at Ting Kok East reception site; then twice per week for the second to fourth week of the first month. Weekly monitoring will be conducted for the second to fourth month and monthly monitoring survey afterwards. During the post-translocation monitoring, the following surveys were undertaken to search for the tagged seahorses #051 and #052..

(a) Intertidal Survey

2.2 Intertidal survey for seahorses was undertaken by active search at the reception site at Ting Kok East by diving survey using SCUBA diving. Active searches of seahorses were conducted during both day and night time when the tidal level is generally >1.5 m CD, and thus a total of two active search events were undertaken at the reception site.

2.3 The active search covered the intertidal and shallow subtidal zones (-0.5 m CD to 2 m CD) at Ting Kok East reception site. Direct observations and active search of seahorses were conducted in all major habitat/substrate types and in potential hiding places such as among litter/debris, inside holes/crevices and under cobbles/boulders. Hand-netting was used to collect seahorses for data collection such as Torso length and sign of injury. Head light and hand torch were used during the night time surveys. The effort of searching was standardized to facilitate comparison of occurrence of seahorse using the number per standard unit effort approach (i.e. number of man-hours). Two survey events were conducted (in two days). Each survey event included not less than three man-hours of day survey and three man-hours of night survey. At least a total of 12 man-hours would be spent over the two survey events.. The actual man-hours spent during each survey was recorded.

(b) Subtidal Dive Survey

2.4 Standard Underwater Visual Census (UVC) (AIMS, 1994)[1] surveys were conducted at the reception site at Ting Kok East at a depth range of -0.5 m CD to -1.5 m CD. Four subtidal dive surveys were conducted, two in day time and two in night time. UVC was performed on belt transects of 5 m width covering the whole survey area. UVC surveys were performed at least 10 minutes after deployment of the buoys and transects. For night time surveys, only underwater qualitative surveys within the survey area were performed. Two survey events were conducted (in two days). Each

survey event included not less than four man-hours of day survey and four man-hours of night survey. At least a total of 16 man-hours would be spent over the two survey events. The actual man-hours spent during each survey was recorded. Six SCUBA divers were parallel to each other and dived in a zigzag route (Figure 2) within the survey area to locate the tagged seahorses #051 and #052 during each subtidal dive survey. Since the two tagged seahorses #051 and #052 were not recorded during the 2 days post-translocation monitoring survey at Ting Kok East reception site while three seahorses were recorded during the First 7 days post-translocation monitoring at depth of more than -1.5 m CD, divers extended the original survey area (Figure 1) away from Ting Kok East towards the deeper depth as shown in Figure 2.

(c) Data Collection

2.5 After translocation was completed, the reception site was monitored regularly by the qualified fish expert over a period of one year, following the same survey methodology for the pre-translocation monitoring.

The following information was provided in the post-translocation monitoring report when seahorse #051, #052 or any other seahorse were found:

- Seahorse species recorded;
- Seahorse abundance;
- Size structure;
- Sex ratio;
- Population estimates through mark/ recapture of the tagged seashores;
- Observation of any temporal / seasonal fluctuations;
- Reproductive status;
- Habitat preferences; and
- Presence of putative pairs.

2.6 Seven to nine SCUBA divers were parallel to each other and dived in a zigzag route (Figure 1) along the survey areas to locate the tagged seahorses #051 and #052 encountered during each dive survey. At least 28 man-hours were spent on each daily survey. Tagged seahorses #051 and #052 were released to their natural habitat after data collection. Specimens were handled with care to reduce disturbance to seahorses as low as reasonably practicable. At least two photos, comprising both side profile of the seahorse and close-up of the side profile of the head, were taken. Video footage was also taken for each individual countered.

3. Results

3.1 The first 7 days seahorse post-translocation monitoring work was done during the period of 21st to 27th January 2018. The environmental conditions for the 7 days translocation work were shown in Appendix A.

3.2 Post-translocation surveys were conducted at the Ting Kok East Reception site with seven to nine divers including marine ecologist. The GPS coordinates of the four corners at the survey area were shown in Table 1.

Table 1 GPS Coordinates at Ting Kok East Reception Site

Points	**Ting Kok East Reception Site**	
A	N 22'28"03.74	E 114'13"10.66
B	N 22'28"03.77	E 114'13"17.54
C	N 22'28"56.60	E 114'13"11.26
D	N 22'28"56.50	E 114'13"18.76

3.3 A total of 28 to 32 man-hours were done each day during the 7 days survey (Table 2) with 7 to 9 divers including the fish expert. Details of diver survey man-hours were shown in Table 2. The two tagged seahorses #051 and #052 were not recorded during the 7 days post-translocation monitoring survey at Ting Kok East reception site. The two tagged seahorses #051 and #052 were missing during the survey and it may be due to the reason that they are still moving around and looking for new home to settle. Besides the tagged seahorses #051 and #052, three female seahorses were recorded at Ting Kok reception site (Table 3) during the 7 days post-translocation monitoring (Photo Plate A) and they all belonged to the same species of *Hippocampus kuda*. They were found at the depth of 1.5 to 3.6 meter of sandy bottom with scattered rocks (Appendix B-1).

Table 2 Total Man-Hours of intertidal and subtidal survey during the 7 days Post-Translocation Monitoring at Ting Kok Reception Site

	2112/18	22/1/18	23/1/18	24/1/18	25/1/18	26/1/18	27/1/18
Day Survey	**Survey Time**						
Intertidal survey	6 hours	6 hours	6 hours	6 hours	6 hours	6 hours	6 hours
Subtidal Survey	8 hours	8 hours	8 hours	8 hours	8 hours	8 hours	8 hours
Total Man-hours for Day Survey	14 Hours	14 Hours	14 Hours	14 Hours	14 Hours	14 Hours	14 Hours
Night Survey	**Survey Time**						
Intertidal survey	6 hours	6 hours	6 hours	6 hours	6 hours	6 hours	6 hours
Subtidal Survey	8 hours	8 hours	8 hours	8 hours	8 hours	8 hours	8 hours
Total Man-hours for Night	14 Hours	14 Hours	14 Hours	14 Hours	14 Hours	14 Hours	14 Hours

Survey							
Total Man-hours for Day and Night Survey	29 hours	29 hours	29 hours	29 hours	29 hours	29 hours	29 hours

Table 3 GPS Coordinates Location of Seahorse #1, #2 and #3 at Ting Kok East

Seahorse #	**GPS Coordinates at Ting Kok East**	
1	N 22'27"59.33	E 114'13"12.19
2	N 22'27"59.10	E 114'13"12.20
3	N 22'27"57.92	E 114'13"13.73

4. Conclusion

4.1 The first 7 days seahorse post-translocation monitoring survey was conducted from 21st to 27th January 2018. A total of 28 to 32 man-hours with 7 to 9 divers including fish expert were conducted each day inside the Ting Kok East reception site. The two tagged seahorses #051 and #052 were missing during the survey and it may be due to the reason that they are still moving around and looking for new home to settle.

4.2 Since the two tagged seahorses #051 and #052 were not recorded during the first 7 days post-translocation monitoring, option two monitoring program (according to the Seahorse Translocation Plan) will be launched and the tentative monitoring schedule is shown in Appendix C.

4.3 The three local seahorses found at Ting Kok East reception site were located at the subtidal area. So the tagged seahorses #051 and #052 may be still searching for their name home at the deeper water of Ting Kok East. Therefore, coming post-translocation monitoring will focus in the subtidal region that deeper than 1m.

5. References

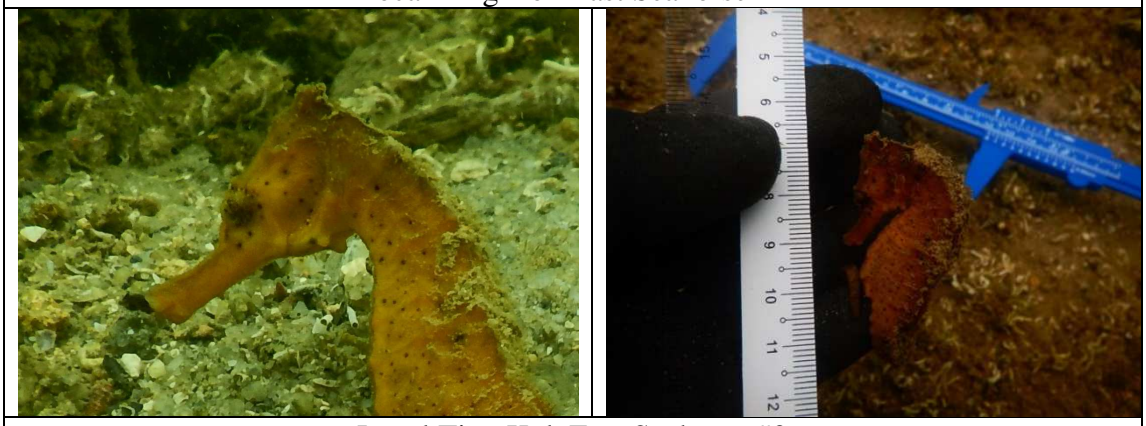
1. Australian Institute of Marine Science. 1994. Survey Manual for Tropical Marine Resources 2nd Edition: Coral Reef Fish Visual Census, p86-92

Figure 1. Post-Translocation Monitoring Survey Route at Ting Lok East

Figure 2. Locations of Local Seahorses Recorded at Ting Kok East

Photo Plate A

Local Ting Kok East Seahorse #1



Local Ting Kok East Seahorse #2

Local Ting Kok East Seahorse #3

Appendix A Environmental Condition at Ting Kok East during Post-Translocation Monitoring Survey

Date	Weather Condition	Temperature (°C)	DO (mg/L)	Turbidity (NTU)	Salinity (‰)	pH
21 January 2018	Cloudy, Northeast Force 3 to 4	**18**	8.30	2	32	7.60
22 January 2018	Sunny Period, North East Force 3 to 4	**18**	8.25	3	32	7.55
23 January 2018	Sunny Period, East Force 4	**18**	8.30	3	32	7.65
24 January 2018	Sunny Period, Northeast Force 3 to 4	**17**	8.45	2	32	7.65
25 January 2018	Sunny Period, East Force 3 to 4	**17**	8.35	2	32	7.60
26 January 2018	Sunny Period, North Force 5 to 6	**18**	8.36	3	32	7.58
27 January 2018	Sunny Period, North Force 5	**18**	8.42	3	32	7.62

Appendix B-1: Local Seahorses Recorded at Ting Kok East during the first 7 days Post-Translocation Monitoring Surveys

Seahorse #	Species	Sex	Reproductive Status*[1]	Torso Length (cm)	Total Length (cm) (Body + Head)	Sighting Location	Depth (m)	Holdfast	Proximity to the nearest seahorse*[2]	Sign of stress or injury
1	*H. kuda*	F	N/A	4.4	11.5	Sandy Bottom	1.3	No	25 m	No
2	*H. kuda*	F	N/A	4.5	11.8	Sandy Bottom	1.8	No	25 m	No
3	*H. kuda*	F	N/A	4.6	12.2	Sandy Bottom	3.6	No	N/A	No

*[1] - N/A: Not Applicable for female seahorse and only male seahorse can show the Reproductive Status

*[2] - N/A: Not Applicable as no nearest seahorse recorded within 50m

Appendix B-2: Seahorses Information at Ting Kok East during the first 7 days Post-Translocation Monitoring Surveys

Sex ratio	Population estimates through mark/ recapture of the tagged seashores;	Observation of any temporal / seasonal fluctuations;	Habitat preferences	Presence of putative pairs
All females	N/A*	No	Sandy bottom	NO

*no tagged seahorse was recorded

Appendix C Updated Monitoring Survey Schedule

Pre-translocation Survey	Survey Date	Working Day
Intertidal + Subtidal		
Lung Mei	20-21/Nov/2017	2
Ting Kok East	23-24/Nov/2017	2
Extra Survey at Ting Kok East (reception site) if no seahorse was found at the first pre-translocation survey	30/Nov/17 to 1/Dec/2017	2
Seahorses Translocation		
Intertidal + Subtidal		
Lung Mei	17-18/Jan/2018	2
Extra Survey at Lung Mei if pregnant seahorses were found OR if no seahorse was found during the first 28 man-hours search	19-20/Jan/2018	2
Post Translocation Survey		
First One Week (Daily)		
Ting Kok East	21-27/Jan/2018	7
Second Week (3 times per week)		
Ting Kok East	30/Jan/18, 1-2/Feb/2018	3
Third Week (3 times per week)		
Ting Kok East	6, 8-9/Feb/2018	3
Fourth Week (3 times per week)		
Ting Kok East	11-13/Feb/2018	3
Second Month (Weekly Survey)		
Ting Kok East	23, 25/Feb/18, 28/Feb-1/Mar/18, 7-8/Mar/18, 14-15/Mar/18	8
Third Month (Weekly Survey)		
Ting Kok East	21-22/Mar/18, 28-29/Mar/18, 4-5/Apr/18, 11-12/Apr/18	8
Fourth Month (Weekly Survey)		
Ting Kok East	18-19/Apr/18, 25-26/Apr/18, 2-3/May/18, 9-10/May/18	8
Fifth Month to Twelve Month (Monthly Survey)		
Ting Kok East	13-14/Jun/18, 11-12Jul/18, 15-16/Aug/18, 12-13/Sept/18 10-11/Oct/18, 14-15/Nov/18 12-13/Dec/18, 16-17/Jan/19	16
Post-Construction Monitoring		

Quarterly to completion to the maintenance period		
Lung Mei (Quarterly Monitoring)	TBD	TBD

THE END