



Hong Kong International Airport Contract P152 – Third Runway EIA Review Consultancy Services

Marine Ecology Conservation Plan

21 March 2016

Environmental Resources Management

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Client: Airport Authority Hong Kong		Project No: 0279899			
Summary: This document presents the Marine Ecology Conservation Plan for the AAHK consultancy for the Hong Kong International Airport – <i>Third Runway EIA Review Consultancy Services (Contract P152)</i> .		Date: 21 March 2016			
		Approved by: 			
		Craig A Reid Project Director			
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**This Marine Ecology Conservation Plan has been reviewed and certified
by the Environmental Team Leader (ETL) in accordance with
Condition 2.8 of Environmental Permit No. EP-489/2014.**

Certified by:



Terence Kong
Environmental Team Leader (ETL)
Mott MacDonald Hong Kong Limited

Date 29 March 2016

Our Ref : 60440482/C/JCHL160330

By Email

Airport Authority Hong Kong
HKIA Tower, 1 Sky Plaza Road
Hong Kong International Airport
Lantau, Hong Kong

Attn: Mr. Lawrence Tsui, Senior Manager

30 March 2016

Dear Sir,

Contract No. 3102
3RS Independent Environmental Checker Consultancy Services

Marine Ecology Conservation Plan

Reference is made to the submission of Marine Ecology Conservation Plan under Condition 2.8 of the Environmental Permit No. EP-489/2014 certified by the Environmental Team Leader and sent to us on 29 March 2016.

We would like to inform you that we have no adverse comment on the captioned submission. Therefore we write to verify the captioned submission in accordance with the requirement stipulated in Condition 1.9 of EP-489/2014.

Should you have any query, please feel free to contact our Isabella Yeung at 3922 9348 or the undersigned at 3922 9376.

Yours faithfully,
AECOM Asia Co. Ltd.



Jackel Law
Independent Environmental Checker

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PREAMBLE

The **Airport Authority Hong Kong** (“AAHK”) is responsible for operation of the Hong Kong International Airport (HKIA). The HKIA Master Plan 2030 (MP2030) recommended expansion of HKIA into a three-runway system (3RS) (“the Project”) as the best way forward to cope with the projected increase in air traffic demand and to secure the continual growth of HKIA operation for the benefit of the economic development of Hong Kong. This development option for HKIA received approval in principle from the Government of the Hong Kong Special Administrative Region (HKSAR) on 20 March 2012.

An Environmental Impact Assessment (EIA) Study Report for the Project was prepared in accordance with the study brief requirements (ESB-250/2012) issued by the Environmental Protection Department (EPD). The EIA Report for the Project (Register No. AEIAR-185/2014) was approved by the EPD on 7 November 2014 and the Environmental Permit (EP) (EP No. EP-489/2014) granted on 7 November 2014.

As part of the EIA Study, AAHK has committed to formulate and implement a *Marine Ecology and Fisheries Enhancement Strategy (MEFES)*. The MEFES for the Project has been set up for the purpose of enhancing the marine environment for the benefit of marine ecology (including Chinese White Dolphins (CWDs)) and fisheries resources in the vicinity of the project area, in Hong Kong western waters and further afield into the Pearl River Estuary (PRE). It is also for the purpose of providing support and assistance to affected fishers to promote more sustainable fishing operations. *Figure 1.1* presents a schematic overview of the different elements of the MEFES and their proposed funding sources. Details of the MEFES are provided in *Annex A*.

In accordance with EP Conditions 2.8 and 2.13, AAHK will establish independent Marine Ecology Enhancement Fund (MEEF) and Fisheries Enhancement Fund (FEF), respectively, to fund initiatives proposed by third-parties (eg Non-Governmental organisations (NGOs), researchers and the fishery sector) that support the objectives of the MEFES. A Marine Ecology Conservation Plan (MECP) and a Fisheries Management Plan (FMP) are developed to describe the proposed mechanism for the implementation of the MEEF and FEF as well as the goals and themes under which funding applications can be made.

This document presents the MECP of the 3RS Project.



Marine Ecology and Fisheries Enhancement Strategy (MEFES)

Direct Funding by AAHK

Voluntary surveillance

- Land-based surveillance
- Vessel-based surveillance



Artificial reef deployment *

- To provide complex hard surface habitat in North Lantau waters
- To provide shelter and promote the recruitment of fish larvae and juveniles
- Restocking of fish fry and shrimp seedling



Restocking of fish fry and shrimp seedling *

- To strengthen fisheries resources in North Lantau waters
- Monitoring of fisheries resources at appropriate locations



Eco-enhancement of seawall design

- To design for the future extension of artificial seawall with eco-enhancement elements
- To help re-colonisation of intertidal and sub-tidal fauna as well as recruitment of juvenile fish



Restriction of access to selected areas for SkyPier High Speed Ferries (HSFs) and construction vessels

- To develop further measures for better protection of Chinese White Dolphins in western Hong Kong waters



Marine Ecology Enhancement Fund (MEEF)

Carrying capacity enhancement

- To enhance carrying capacity in nearby important marine habitats, including marine parks
- To investigate and implement enhancement measures in key habitats in the North Lantau / Hong Kong / PRE waters



“Dolphin friendly” activities

- To investigate the feasibility of implementing measures to support protection of marine habitats and Chinese White Dolphin hotspots



Recovery of fisheries resources

- To restore fisheries resources through feasibility studies and scientific research



Scientific Research

- To identify and conserve important marine habitats through objective-driven, well-executed scientific research
- To provide technology and innovation that can benefit conservation programmes



Fisheries Enhancement Fund (FEF)

Support the fishing industry

- To identify opportunities to assist fishermen operating in the western Hong Kong waters
- To promote the sustainable development of the fishing industry



Fisheries resources enhancement

- To enhance habitats for fisheries resources in nearby sites of fisheries importance and beyond when implementing the land formation works
- To bring benefits to fisheries resources and subsequently to fishermen operating in north and west Lantau waters



* Implementation would be subject to outcome of feasibility studies



2 INTRODUCTION

2.1 BACKGROUND

As part of the EIA Study, AAHK has committed to formulate and implement a *MEFES* to contribute to enhancing marine ecology, including the CWD, and fisheries resources in north Lantau waters (refer to Section 13.13 of the EIA Report). Through discussions with stakeholders and experts, AAHK identified the following key enhancement aspects for the MEFES:

- Enhancement of habitats for marine ecology and fishery resources;
- Promotion of a sustainable fisheries industry;
- Encouragement of scientific research and studies; and
- Promotion of environmental education and eco-tourism.

Following a request for further information, supplementary information to the EIA Study was provided to EPD to elaborate the commitments for the MEFES that were outlined in Section 13.13 of the EIA Report (available at http://www.epd.gov.hk/eia/register/report/eiareport/eia_2232014/further_info/pdf/Marine_Ecology_and_Fisheries_Enhancement_Plan.pdf).

The four key enhancement aspects were presented in more detail in the supplementary attachment, and opportunities for additional enhancement of marine habitats during construction phase were also described.

Supplemental information was also provided to outline the public consultation/ stakeholder engagement plan for proposed arrangements for funding and management of the enhancement initiatives, through the establishment of the FEF and MEEF and the associated Fund Management Committees. Details of the mode of operation of the Committees, as well as procedures for allocating and awarding funding were proposed to be devised in consultation with relevant stakeholders before commencement of construction.

Additional detail on the design, operation and management of the MEFES and the implementation of the FEF and MEEF was also presented in the 200th meeting of the Advisory Council on the Environment (ACE) held on 15 September 2014 which discussed the EIA Report of the 3RS Project. ACE provided views on the EIA report to the Director of Environmental Protection (DEP) with conditions that AAHK shall establish independent MEEF and FEF for implementation of a MECP and a FMP. AAHK shall also set up a management committee for each of the funds.





The Permit conditions set out in the EP ⁽¹⁾ related to the submission of a MECP and the establishment of a MEEF are as follows.

EP No. EP-489/2014, Condition 2.8

“The Permit Holder shall establish an independent Marine Ecology Enhancement Fund (The Fund) which shall have substantial resources to meet its conservation objectives in a long-term and sustainable manner. The Permit Holder shall, no later than 3 months before the commencement of reclamation related marine works of the Project, submit 3 hard copies and 1 electronic copy of a detailed Marine Ecology Conservation Plan (The Plan) to the Director for approval. The Plan shall be formulated for the conservation of marine life particularly the Chinese White Dolphins (CWD) within the Hong Kong and the Pearl River Estuary (PRE) waters. The Plan shall cover the relevant marine parks and other important marine habitats in Hong Kong to enhance their carrying capacity, “dolphin friendly” activities, the recovery of fisheries resources, and scientific research for the overall benefits of marine mammals, particularly CWD, in the PRE during the construction and the operation of the Project. A management committee shall also be set up for The Fund with members from different stakeholders including relevant academics, green groups and dolphin experts for effective implementation of The Plan.

The Permit Holder shall consult the Director of Agriculture, Fisheries and Conservation in preparing the Plan and submit The Plan and the setup of The Fund to the ACE [Advisory Council on the Environment] for comment prior to the submission to the Director for approval.”

2.2

PURPOSE OF THE MECP

As stated in the MEFES and EP Condition 2.8, the purpose of the MECP is, in essence, to formulate a strategy for the conservation of marine life particularly the CWDs within the Hong Kong and the PRE waters. The MECP is intended to be applicable to the relevant existing or planned marine parks as well as to other important marine habitats in Hong Kong with an overarching aim of enhancing carrying capacity promoting “dolphin friendly” activities, encouraging the recovery of fisheries resources, and undertaking scientific research for the overall benefit of marine mammals, particularly CWD, in the PRE during the construction and the operation of the Project. A management committee will also be set up for the MEEF with members from different stakeholder groups including relevant academics, green groups and dolphin experts for effective implementation of the MECP. By assisting third parties through the provision of funding for education and research to support the conservation and enhancement of the marine environment, AAHK intends to create the necessary stimulus to bring conservation initiatives for these important habitats and species to fruition.

(1) <http://www.epd.gov.hk/eia/register/permit/latest/ep4892014.htm>





This MECP outlines the proposed mechanism for the implementation, the funding arrangements, and the setting up of a management committee for the MEEF to manage and administer the MECP. Some potential marine ecology conservation and enhancement example initiatives are also included in an annex to this document to provide assistance to the management committee in effectively implementing the MECP.

2.3 ***STRUCTURE OF THE MECP***

Following this introductory section, the remainder of this *MECP* is organized as follows:

- *Section 3* presents the overall goal of the MECP and the organisation, management and administration of the MECP;
- *Section 4* introduces the goals, objectives as well as the implementation and evaluation of the key themes under the MECP; and
- *Section 5* summarizes the overall framework of the MECP.





3 ORGANISATION, MANAGEMENT AND ADMINISTRATION OF THE MECP

3.1 GEOGRAPHICAL COVERAGE

The MECP has been formulated to contribute to the conservation and enhancement of marine life particularly the CWDs within Hong Kong and PRE waters. The area of interest for this MECP therefore includes marine waters and habitats in the vicinity of the 3RS land formation area and further afield into the PRE (*Figure 3.1*). Specifically this includes north Lantau, where existing and planned marine parks and other important marine habitats are located, and west Lantau, where key habitats for CWDs are found.

It should be noted that the initiatives and measures introduced to the marine habitats of the area of interest could potentially introduce longer term benefits to the marine ecology of adjacent marine waters. Also the area of interest may extend beyond that identified above if it is identified in the future that conservation and enhancement initiatives have been successful in this area and other areas in the vicinity would benefit from similar initiatives.

3.2 OVER-ARCHING ASPECTS

Annex B provides a high-level description of the physical and marine ecological characteristics of western Hong Kong waters, in particular north and west Lantau waters. This review provides the basis for identifying key habitats, species or ecological resources that may warrant focused effort in conservation, enhancement and restoration under the MECP. A summary map of the physical and ecological setting of the 3RS project is presented in *Figure 3.2*. From the information presented it is noted that there are aspects of the broader environment that provide opportunities for enhancement or restoration (recovery) to conserve marine life within the Hong Kong and the PRE waters. The EP for the 3RS Project references the above in Condition 2.8 as follows:

*“The Plan shall be formulated for the conservation of marine life particularly the Chinese White Dolphins (CWD) within the Hong Kong and the Pearl River Estuary (PRE) waters. The Plan shall cover the relevant marine parks and other important marine habitats in Hong Kong to **enhance their carrying capacity, “dolphin friendly” activities, the recovery of fisheries resources, and scientific research** for the overall benefits of marine mammals, particularly CWD, in the PRE during the construction and the operation of the Project.”*

3.2.1 Enhancement of Carrying Capacity

AAHK has identified the potential to enhance carrying capacity for marine ecology and fisheries resources in important marine habitats, including the existing and planned marine parks, during project development and operation. A key aspect



Figure 3.1
Schematic of Focus Areas of the MEFES

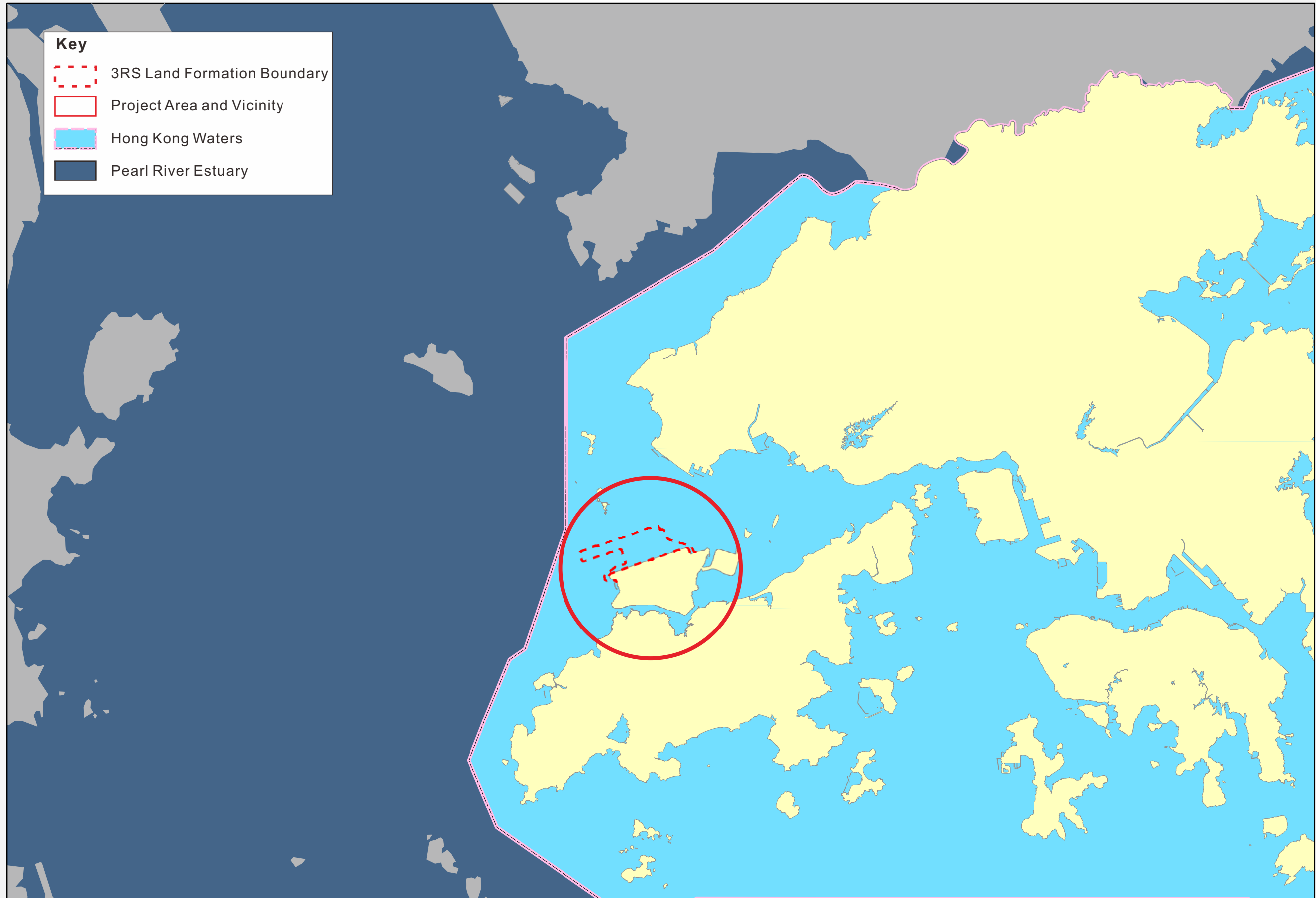
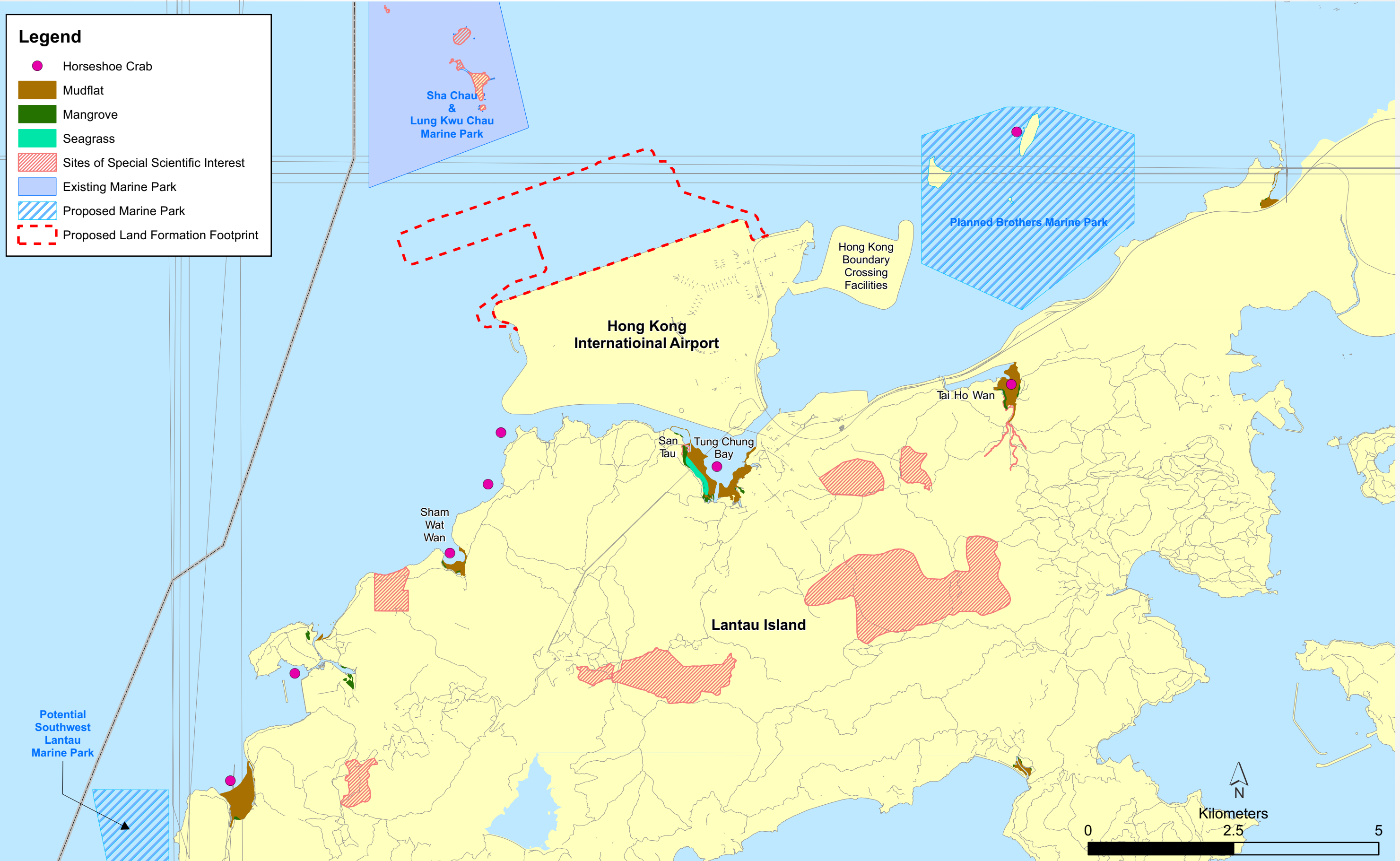


Figure 3.2
Physical and Ecological Setting





would be to investigate and implement enhancement measures in key habitats in the north Lantau / Hong Kong / PRE waters, which are not directly impacted by the 3RS construction and thus earlier implementation may be possible before or during construction of the 3RS. These early measures could potentially cover the existing Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP) and the planned The Brothers Marine Park (BMP) which will both form part of the new interconnected marine park matrix as well as key habitats / species not limited to seagrass beds, mud flats and horseshoe crabs.

3.2.2 “Dolphin Friendly” Activities

AAHK strives to further contribute to territory-wide CWD conservation through additional potential enhancement measures (i.e. “dolphin friendly” activities). It is proposed to investigate the feasibility of implementing measures to support protection of marine habitats and CWD hotspots. It is expected that the “dolphin friendly” activities would allow CWDs to safely use the habitats that serve as potential shelter areas for CWDs that may be temporarily displaced by 3RS marine activities.

3.2.3 Recovery of Fisheries Resources

AAHK is committed to identifying opportunities to restore the marine environment through feasibility studies and scientific research. Also, as is common with elsewhere in Hong Kong where the seabed has been affected by relatively intense demersal trawling activities, restoration by means of artificial reef deployment can be explored. Other approaches such as restoration of degraded natural coastal habitats and transplantation or relocation of rare or protected species are also included for consideration in this MECP. Notably, the designation of the 3RS Marine Park will provide a positive influence on restoration and recovery of marine ecological resources in waters affected by the construction of the Project.

3.2.4 Scientific Research

Scientific information on the marine environment of the waters around the HKIA has been gathered by AAHK in the course of the 3RS EIA Study. Important marine habitats have been identified on which conservation efforts could be focussed. AAHK understands that the success of marine conservation programmes can be aided by having objective-driven, well-executed scientific research. Also research can provide technology and innovation that can benefit conservation programmes.

3.3 GOAL

As described in *Section 13.13* of the EIA report, the ultimate goal of the MEFES is to contribute to enhancing marine ecology (including for CWDs) and fisheries resources in north Lantau waters. The implementation of the 3RS Project is intended to provide an opportunity to give cumulative benefit to marine ecology in north and west Lantau waters.





3.4

MANAGEMENT AND FINANCING OF THE MECP

AAHK will ensure the MECP is implemented in compliance with the requirements of Condition 2.8 of EP No. EP-489/2014 and have oversight of the implementation of studies and projects under the key aspects and initiatives of the plan. Specific AAHK responsibilities for the key themes are presented below in *Section 4* of this document.

To meet the goal and conservation objectives of the MECP in a long-term and sustainable manner, substantial resources, both financial and manpower support are essential. An independent MEEF, managed by a management committee, will be established for effective implementation of the MECP. It is noted that the MEEF is intended to fund studies and projects that are non-profit making in nature only.

3.4.1

Marine Ecology Enhancement Fund (MEEF)

The MEFES proposed as part of the EIA Study led to the development of a preliminary budget estimate for the MEEF and FEF. The two Funds would be in total in the order of HK\$200 - 300 million, subject to approval from the Board of AAHK. Subsequently during the ACE discussion, AAHK had committed a substantial sum of up to HK\$150 million for each Fund, and both Funds were initially planned to run for around 10 years, with a large portion of the fund expected to be used for scientific research, studies and follow-on actions/ initiatives in the initial years.

Recommendations from the ACE highlighted the need to provide sufficient resources to sustain the marine conservation efforts of the MECP over the long term. In response to the recommendations, the initial plan to run the MEEF for around 10 years has been reviewed and it is apparent that a fund that can support initiatives over the long term would be much preferred and in line with ACE's expectation. To achieve this it is considered that an endowment fund arrangement whereby seed money is invested to target the generation of investment return to meet an annual budget ("Annual Allocation") that is able to support the MECP in the long term. The endowment fund arrangement is targeted to generate 4% annual return based on an optimistic forecast. In the event that the targeted investment return is not achieved, any shortfall below the Annual Allocation as approved by the Steering Committee is proposed to be topped up by an additional top-up fund, which has a cap of HK\$100 million in total for both MEEF and FEF, to ensure that resources to support MECP are not compromised.

In summary, AAHK proposes the following arrangement for the MEEF:

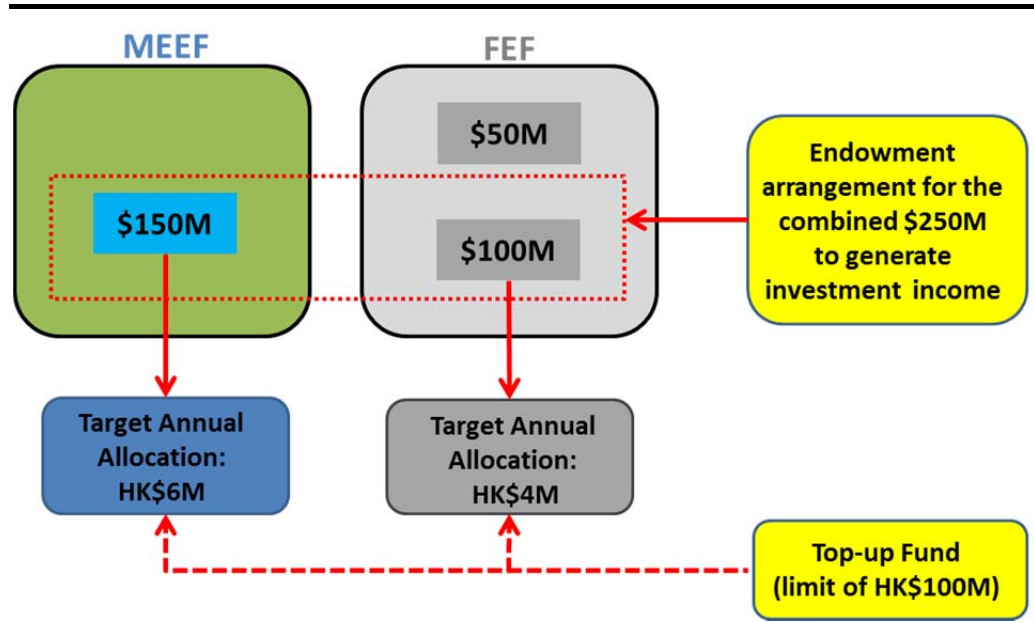
- A committed initial HK\$150 million allocation as an endowment fund;
- The HK\$150 million endowment arrangement is targeted to return around HK\$6 million per year, these funds to be used to implement the MECP; and
- Any shortfall below the Annual Allocation is proposed to be topped up by an additional top-up fund established for both the FEF and the MEEF, which has a cap of HK\$100 million in total.





The above fund arrangement is illustrated in *Figure 3.3*. The proposed arrangement provides an initial quantification of funds committed for the sustainable and long-term implementation of the MECP, representing AAHK's commitment in contributing to enhancing marine ecology (including for the CWD) in practical and effective ways in north and west Lantau waters in the future.

Figure 3.3 *Proposed Fund Arrangement for the Marine Ecology Enhancement Fund (MEEF)*



The proposed funding application, approval and allocation mechanism will be further developed and described in detail in the instrument constituting the fund, and the guidance notes and application form for the fund.

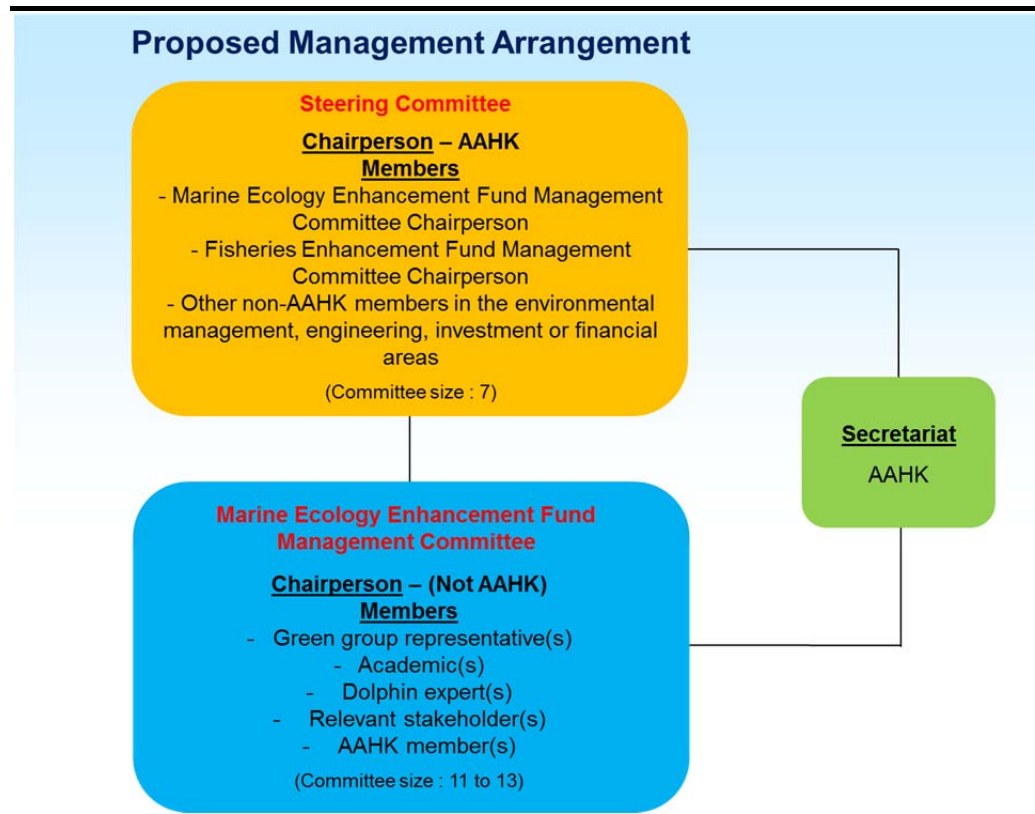
3.4.2 *Proposed Fund Management Structure*

AAHK has put continuous effort into consulting stakeholders. Consequently, in order to formalise the process and provide a platform for dialogue AAHK will establish a management committee (MEEF-MC) to administer the MEEF for the effective implementation of the MECP. In addition, a Steering Committee is proposed to be established to provide overall directional guidance / policies for the fund operation to enable sufficient resources will remain available for the fund to meet its objectives in a long-term and sustainable manner. The MEEF-MC will approve recommended funding applications that are within the Annual Allocation. The Steering Committee will not override MEEF-MC decisions on funding application approvals within the Annual Allocation and will not undermine the role of the MEEF-MC. The management arrangement of the MEEF is illustrated in *Figure 3.4*.





Figure 3.4 Proposed Management Arrangement for the Marine Ecology Enhancement Fund Management Committee (MEEF-MC)



Marine Ecology Enhancement Fund Management Committee (MEEF-MC)

It is envisaged that the MEEF-MC will be composed of a diverse membership including AAHK, relevant academics, green groups and dolphin experts. Relevant stakeholders (including community leaders as well as people having expertise/ experience in managing similar funds) would also be considered for appointment into the management committee. The exact membership will be determined subject to agreement from potential candidates. AAHK will serve (or will procure a third party to serve) as the Secretariat for the MEEF-MC.

The remit of the MEEF-MC will be to manage and operate the MEEF so as to ensure that funds are granted to studies and projects relevant and appropriate to the key themes and initiatives of the MECP. Its primary role is to determine the criteria for the selection of initiatives to be funded by MEEF, to make recommendations on funding applications that meet the fund objectives and approve the applications that are within the Annual Allocation approved by the Steering Committee. The MEEF-MC will study the proposals and report the approved applications to the Steering Committee. If the recommended funding support exceeded the Annual Allocation in any particular year, the MEEF-MC will present the recommendations to the Steering Committee for consideration and approval of the shortfall from the top-up fund. For each approved application, appropriate reporting on progress is required and the MEEF-MC will monitor and review the project outcomes, including the





effectiveness of the approved applications in achieving the goals and objectives of the MEEF, so as to make necessary refinement/ adjustment to future funding focuses. The draft terms of reference for the MEEF-MC (which will be subject to review / revision by the committee members) has been prepared and is included in *Annex C*.

Steering Committee

AAHK proposes to establish a Steering Committee to provide overall directional guidance / policies for the operation of the MEEF to enable sufficient resources will remain available for the fund to meet its objectives in a long-term and sustainable manner. Its functions will include:

- steering and reviewing the operations of MEEF (but it will not have authority to override matters within the exclusive power of the MEEF-MC);
- approving the funding budget to be allocated to the MEEF-MC;
- overseeing the use, allocation, and investment performance of the MEEF; and
- reviewing the overall funding situation including the sufficiency and sustainability of the top-up fund arrangement.

Besides, if the total funding amount of the applications recommended by the MEEF-MC exceeds the Annual Allocation, the Steering Committee may exercise its discretion to approve the recommended application(s) for funding support by drawing the shortfall from the top-up fund.

It is envisaged that the Steering Committee will be chaired by the AAHK and composed of the chairperson of the MEEF-MC, the chairperson of the FEF-MC and other non-AAHK members nominated by reputable organisations in the environmental management, engineering, investment, or financial areas. For clarity, there does not need to be a member in each of the areas referred to above and the members may be nominated by one or more reputable organisations. The exact membership will be determined subject to agreement from potential candidates. AAHK will serve (or will procure a third party to serve) as the Secretariat for the Steering Committee. It should be noted that the Steering Committee is also proposed to provide oversight to the FEF and FMP to be prepared under separate cover.

Appointment Procedure

The Secretariat will invite reputable organisations in the environmental management, engineering, investment, or financial areas to nominate person(s) having relevant professional expertise / experience to occupy the seats of 4 member(s) of the Steering Committee.

The Secretariat will:





- appoint the persons nominated by the organisation(s) as described above to be those 4 members above of the Steering Committee upon their acceptance; and
- appoint the person nominated by AAHK as described above to be the Chairperson of the Steering Committee upon their acceptance.

3.4.3 MEEF-MC Membership

It is suggested that the membership reflects the three broad themes that will comprise the MECP. It is proposed that the committee will comprise of 11 to 13 members (including the Chairperson), including Green Group representative(s), Academic(s), Dolphin Expert(s), up to 2 representatives nominated by AAHK and other Relevant Stakeholder(s). It is envisaged that AAHK will not chair the MEEF-MC. The code of conduct will be agreed amongst the MEEF-MC.

Green Group representative(s)

Green group representative(s) will be engaged as the member(s) of the MEEF-MC with a suggested focus of overseeing the sustainability of projects, especially in the Marine Education and Tourism theme and to provide insight on the potential benefits to the communities throughout the execution of the project.

Academic(s)

Academic(s) will be engaged as the member(s) of the MEEF-MC with a suggested focus of overseeing the technical feasibility of projects, especially in the Marine Conservation and Marine Research themes. They will justify the proposed assessment for the measurement of project performance as well as to provide comments and advice that may enhance effectiveness of projects.

Dolphin Expert(s)

As one of the core focuses of the MECP is the conservation of CWDs within the Hong Kong and PRE waters, Dolphin Expert(s) will be engaged as member(s) of the MEEF-MC to provide advice and guidance on the selection and implementation of projects that may advance scientific understanding of CWDs in HK waters and the PRE and which may contribute to the long-term conservation of CWDs and their habitats.

AAHK Member(s)

As the core focus areas of the MEEF-MC are environmental enhancement and community benefit, it is suggested that there will be up to 2 representatives nominated by AAHK on the Committee, which may include the associated specialist / environmental consultant(s).

Relevant Stakeholder(s)

Community leader(s) as well as people having expertise / experience in managing similar funds will be considered for appointment into the MEEF-MC to provide advice





on the fund administration and help streamline the implementation and management of the fund.

Appointment Procedure

The Secretariat of the MEEF-MC will compile a list of potential candidates including, but not limited to, any member of any consultative and advisory committee of the AFCD to be the Chairperson and members of the MEEF-MC that satisfy the composition stated above.

The Secretariat will invite the potential candidate(s) to be Chairperson or member(s) of the MEEF-MC.

The Secretariat will appoint the candidate(s) to be Chairperson or member(s) of the MEEF-MC upon their acceptance. If potential candidate(s) declined the invitation, the Secretariat will propose alternative candidate(s) to ensure that the MEEF-MC would meet the composition requirements stated above.

Each member of the MEEF-MC will be appointed for a fixed term of 3 years, unless otherwise agreed with that member.

3.4.4 Secretariat Structure, Role & Responsibilities

AAHK will provide secretarial services (or will procure the provision of secretarial services by an external third party) to the MEEF to facilitate the functions of the Steering Committee and the MEEF-MC.

The secretariat will:

- be responsible for the preparation of meeting notices, agendas, meeting translation and minute taking;
- collate progress reports / final reports submitted by funded projects, as well as the summary of total applications received, successful applications, ongoing projects and completed projects in a year for review and reference by the Steering Committee and the MEEF-MC; and
- work with the AAHK and the Chairperson of the MEEF-MC to ensure proper expertise is present at relevant meetings.

3.5 PROPOSAL SELECTION

It is expected that criteria for the selection of successful initiatives for funding will be formulated and agreed by the MEEF-MC. The Steering Committee will not override a decision of the MEEF-MC and will not undermine the role of the MEEF-MC. In general, it is anticipated proposals will be evaluated based on the strength of their contribution to MEFES objectives, especially the conservation goals to be discussed in Section 4, and the overarching aspects stated in Section 3.2 in terms of providing the outcomes that will clearly benefit habitats and species and stakeholders (public and





fishers ⁽¹⁾ (Figure 3.5). It is expected that while proposals may focus on one theme, they may be able to contribute across other themes, which could be taken into account in evaluations.

3.6 IMPLEMENTATION PLAN

It is expected that the MECP will be implemented throughout the construction and operation phases of the 3RS Project and into the future. AAHK endeavours to implement the MECP and approve and allocate funding to studies and projects that meet the goal and objectives of the MECP as soon as practical subject to the timely establishment and recommendations from the MEEF-MC. A tentative programme for the implementation of the MECP is presented in Table 3.1. The AAHK has been conducting consultations with relevant stakeholders and the AFCD to formulate the MECP. It is expected that the MECP will be submitted to ACE for comment in Q4 2015, followed by submission to the DEP in Q1 2016. The establishment of MEEF and MEEF-MC will commence after the final approval by the DEP and the fund is planned to be in place for application in Q3 2016.

Table 3.1 Tentative Programme for the Implementation of MECP

Key Tasks	Time
Consultation with relevant stakeholders and the AFCD	2015 - Ongoing
Submission of MECP to ACE for comment	2015 Q4
Submission of MECP to the DEP for approval	2016 Q1
Establishment of the MEEF and MEEF-MC	2016 Q2 ⁽¹⁾
Call for funding applications	2016 Q3 ⁽¹⁾

Note:

(1) Subject to the final approval by the DEP.

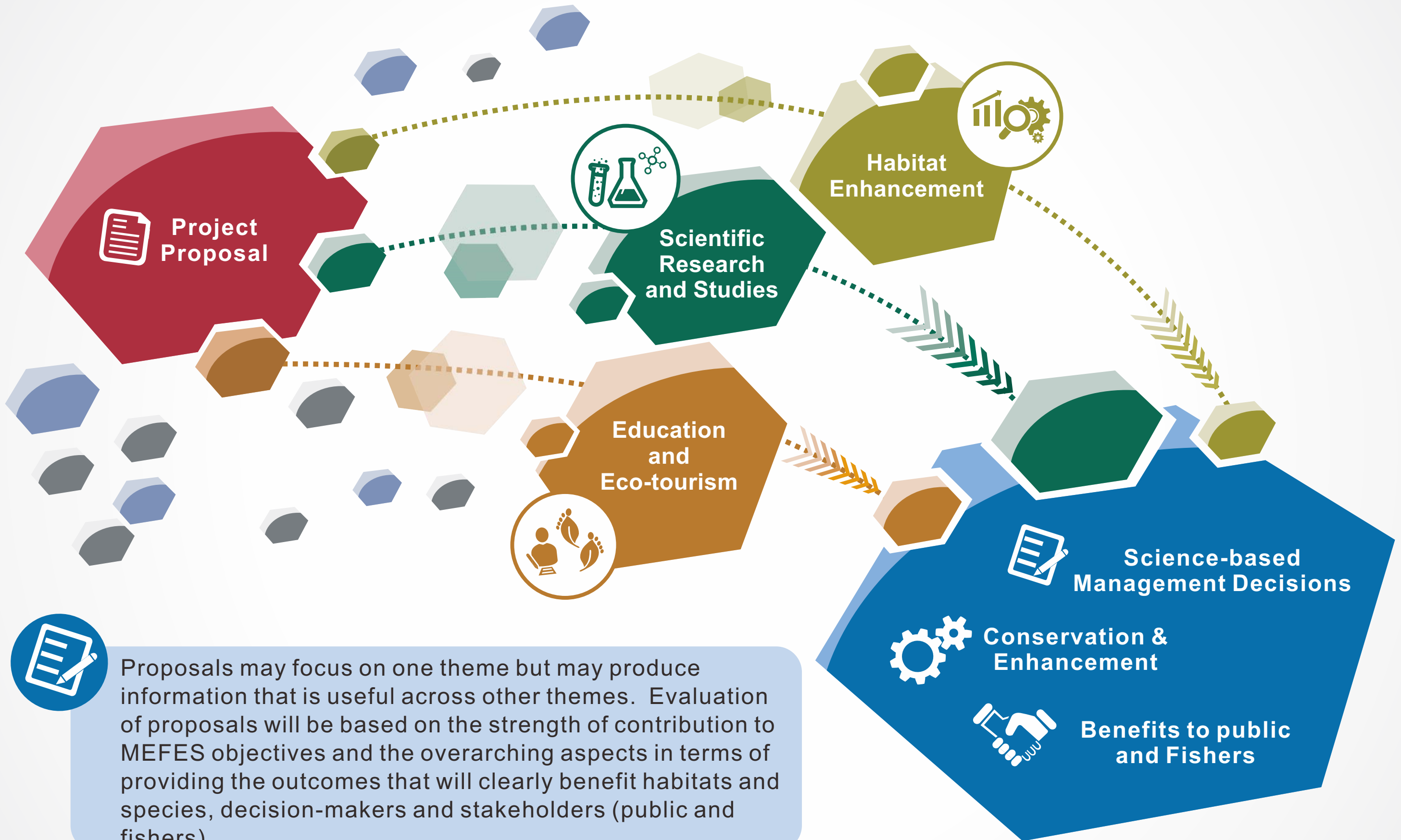
3.7 REVIEW AND EVALUATION OF THE MECP

In order to determine whether the MECP is successful in achieving the goals presented in Section 3.3 it is important to implement a mechanism for reviewing and evaluating the success of the Plan and supported initiatives. Review and evaluation mechanisms are proposed for each of the three themes in Section 4. The MEEF-MC will monitor the performance of the funded applications so as to make necessary refinement/ adjustment to future funding focuses.

(1) Fishers refer to fishermen and people related to fishing industry.



Figure 3.5
General Considerations for Selection of Proposals for Funding



Proposals may focus on one theme but may produce information that is useful across other themes. Evaluation of proposals will be based on the strength of contribution to MEFES objectives and the overarching aspects in terms of providing the outcomes that will clearly benefit habitats and species, decision-makers and stakeholders (public and fishers).



4 KEY THEMES OF THE MECP

4.1 BACKGROUND

The MECP aims to achieve its conservation goals by supporting studies and initiatives leading to:

- Enhancement of habitats for marine ecology and fishery resources;
- Encouragement of scientific research and studies; and
- Promotion of environmental education and eco-tourism.

The MECP is therefore organized into three themes, each of which is developed further and discussed in detail below. These themes are:

- Marine Habitat & Resource Conservation & Enhancement Theme;
- Scientific Research & Studies Theme; and
- Environmental Education & Eco-tourism Theme.

4.1.1 *Marine Habitat & Resource Conservation & Enhancement*

In order to compensate for the seabed habitat and open waters habitat loss associated with the land formation for the 3RS project, the establishment of a new Marine Park is proposed which would comprise an area of approximately 2,400 ha. It is expected that the new Marine Park would provide critical linkages between the current SCLKCMP (1,200 ha) and the planned BMP (850 ha). It is important to note that the establishment of the new Marine Park is an EIA commitment made by AAHK for the compensation of habitat loss due to the land formation for the 3RS project and hence is not a part of the MECP. While a number of the management measures / controls / restrictions in a marine park are the responsibility of the Country and Marine Parks Authority (i.e. AFCD and the Country and Marine Parks Board), certain initiatives can be undertaken by others to enhance the marine ecology within the new Marine Park as well as within the wider marine park matrix formed by the new Marine Park, the SCLKCMP and the planned BMP. The Marine Habitat and Resource Conservation and Enhancement Theme therefore presents opportunities for enhancing the value of the new marine park and related initiatives may be funded under the MECP.

In addition, initiatives to facilitate conserving or enhancing other key marine habitats / species found in north Lantau waters can also be explored under the Marine Habitat and Resource Conservation and Enhancement Theme. Such enhancements may provide beneficial effects on the ecology of north Lantau waters while also providing opportunity for ecological enhancement during the construction stage of the 3RS, prior to the new Marine Park designation.





4.1.2 Scientific Research & Studies

Scientific information on the marine environment of western Hong Kong waters has been gathered by AAHK in the course of undertaking the 3RS EIA. Important marine habitats have been identified on which conservation efforts could be focussed. AAHK understands that the success of marine conservation programmes can be aided by having objective-driven, well-executed scientific research, and has subsequently identified a variety of studies that could be funded as part of the MECP. Scientific research may be directed towards:

- Providing long-term monitoring/ in-depth understanding of marine ecology/ fisheries resources in western Hong Kong waters as well as the wider PRE;
- Providing accurate and timely scientific information and advice for management of the Marine Parks and the surrounding environs;
- Increasing our understanding of the natural variability of the ecosystems and their response to natural or anthropogenic disturbances;
- Ensuring that decision making and recommendations are supported by the most appropriate available scientific information; and
- The strategic and effective application of the research findings to conservation strategies and action plans.

4.1.3 Environmental Education & Eco-tourism

The north Lantau coast and northwest Lantau waters are rich in marine ecological and fisheries resources, which has long been recognized by the general public of Hong Kong. These include coastal habitats such as mudflats, mangroves and seagrass habitats at Tai Ho Stream SSSI, Tung Chung Bay, San Tau Beach SSSI and Sha Lo Wan. These coastal habitats support abundant and diverse intertidal assemblages and also are identified as nursery grounds for horseshoe crabs. The existing footpaths along the North Lantau coasts enhance the public accessibility to these natural coastal habitats and this provides good opportunities for the public to appreciate these natural resources and raise their awareness on the importance of conserving these valuable resources. Besides visiting the coastal habitats, guided eco-tours for dolphin watching are also popular tourist activities in western and northwestern Lantau waters (e.g. Tai O).

Under the Environmental Education and Eco-tourism Theme, initiatives are proposed to promote public awareness of natural habitat and species conservation issues as well as to facilitate the development of eco-tourism of coastal and CWD habitats in Hong Kong western waters.





4.2 GOALS AND OBJECTIVES

4.2.1 Marine Habitat & Resource Conservation & Enhancement

The main goal of the Marine Habitat and Resource Conservation and Enhancement Theme is to enhance marine ecology within the new Marine Park, the wider marine park matrix as well as other key habitats / species in the north Lantau waters. In addition, enhancement initiatives in the broader surrounds of Hong Kong and neighbouring PRE waters may also be considered.

The main objectives of this theme are as follows:

- Support investigation and implementation of habitat enhancement measures that will be beneficial to the new Marine Park and its wider matrix;
- Assist investigation and implementation of ecological enhancement measures of key habitats / species in the north Lantau waters, which are not directly impacted by the 3RS construction and thus earlier implementation is possible before or during construction of the 3RS. These early measures could potentially cover the existing SCLKCMP and planned BMP which will form the new marine park matrix as well as key habitats / species including but not limited to seagrass beds, mud flats and horseshoe crabs; and
- Assist other enhancement initiatives in the wider marine environment in Hong Kong and neighbouring PRE.

4.2.2 Scientific Research & Studies

The overall goal of the Scientific Research and Studies Theme under the MECP would be to establish the characteristics of different marine ecological resources and their natural variability in the western waters of Hong Kong as well as the wider PRE for CWDs. Findings would be used to facilitate the allocation of conservation effort in order to focus on areas / species of high ecological / conservation importance and interest. This would allow cost-efficient and ecologically-relevant conservation programmes to be conducted in the future as a priority.

4.2.3 Environmental Education & Eco-tourism

The main goal of this Environmental Education and Eco-tourism Theme is to facilitate the recreational / eco-tourism experience of visitors to the north and northwest Lantau areas and to provide educational opportunities to raise public awareness on natural habitat and species conservation issues. Specific objectives of this theme include the following:

- To upgrade the existing facilities or provide new facilities to enhance eco-tourism experiences in the area (e.g. provision of interpretative signs and panels, development of mobile-friendly applications, etc);





- To provide education materials to the public to promote their understanding of marine ecological resources and their conservation values in Hong Kong;
- To organise campaigns and education programmes for the public on marine conservation; and
- To provide training to eco-tourism service providers and frontline environmental protection staff for capacity building on implementation of conservation plan.

4.3 POTENTIAL INITIATIVES

Indicative lists of example initiatives under each of the three themes are provided in *Annex D*. The lists are not considered to be definitive, but demonstrate the range of opportunities under the MEFES for developing a long-term understanding of the relevant key conservation aspects in Hong Kong and the PRE. It should be noted that the actual initiatives to be undertaken under each theme will be proposed by third-party applicants for consideration by the MEEF-MC.

4.4 IMPLEMENTATION AND FUNDING

The initiatives of the three themes involve substantial activities that need to be conducted during the construction and operational phases of the 3RS development. It is expected that initiatives submitted by third-parties will have focused implementation/work plans as discussed with AAHK and MEEF-MC and that these would be separate activity driven documents and therefore are not included within this MECP.

The funding applications for each initiative will depend on project / research interest; it is not possible to estimate funding allocation for individual initiative at this stage. Funding for initiatives will be as per funding agreements between third-party applicants and the MEEF-MC and are also not included in this MECP.

4.5 ROLES & RESPONSIBILITY

Several entities are identified who will be integral to achieving the overall goal of three key themes. These entities and their roles and responsibilities are presented below.

AAHK

The main role of the AAHK will be:

- To ensure the MECP is implemented in compliance with the requirements of Condition 2.8 of EP No. EP-489/2014;
- To coordinate with relevant authorities on the implementation of further enhancement measures within the relevant marine parks as well as other key habitats / species in the north Lantau / Hong Kong / PRE waters; and
- To encourage NGO(s) and researchers to take leadership of certain initiatives and focus areas under the three themes of the





MECP.

NGO(s)	It is expected that local NGO(s) may pursue certain initiatives and focus areas under the three themes, including scientific research and education, potentially including reporting on study progress to the MEEF-MC regularly.
Researchers	It is expected that there may be a need to conduct specialist research, design or monitoring studies as outlined in <i>Annex D</i> . The researcher will have to report on progress of the research, design or monitoring activities and studies to the MEEF-MC.
MEEF-MC	The main role of the MEEF-MC will be to oversee the management and implementation of the MECP and to provide peer review guidance to the progress of specialist studies / projects related to the three themes.

4.6

REVIEW & EVALUATION

In order to evaluate the effectiveness and efficiency of supported initiatives under the three themes a process of ongoing performance evaluation is proposed. It is suggested that performance evaluation shall be arranged around a group of specific high level performance indicators. The example performance indicators envisaged at this early stage are detailed in *Annex D*. The MEEF-MC will monitor the performance of the funded applications so as to make necessary refinement/adjustment to future funding focuses.

It should be noted that the performance indicators will be set and agreed between the third-party applicants and the MEEF-MC for the actual initiatives to be undertaken under each theme.





This document presents details on the proposed mechanism for the implementation, the funding arrangements, and the setting up of a management committee for the MEEF to manage and administer the MECP. The MECP is intended to be applicable to the relevant existing or planned marine parks as well as to other important marine habitats in Hong Kong with an overarching aim of enhancing carrying capacity, promoting “dolphin friendly” activities, encouraging the recovery of fisheries resources and undertaking scientific research for the overall benefits of marine mammals, particularly CWDs, in the PRE during the construction and the operation of the Project. In addition, the document contains information on the goals, management and administration of the MECP and introduces the three themes that when implemented are expected to achieve the stated goals. These themes are:

- Marine Habitat & Resource Conservation & Enhancement Theme;
- Scientific Research & Studies Theme; and
- Environmental Education & Eco-tourism Theme.

To meet the conservation objectives in a long-term and sustainable manner, it is considered that an endowment fund arrangement whereby seed money is invested to generate an annual investment return that is able to support the MECP in the long term. In the event that the targeted investment return is not achieved, any shortfall below the Annual Allocation is proposed to be topped up by an additional top-up fund to ensure that resources to support MECP are not compromised. It is important to note that the endowment fund with top-up fund arrangement would allow funds to be available sustainably and AAHK will ensure the MECP is implemented in compliance with the requirements of Condition 2.8 of EP No. EP-489/2014 and have oversight of the implementation of studies and projects under the key aspects and initiatives of the plan.

AAHK will establish a MEEF-MC, composing of members from AAHK, relevant academics, green groups, dolphin experts and relevant stakeholders to administer the MEEF for the effective implementation of the MECP and approve the applications that are within the Annual Allocation. In addition, a Steering Committee is proposed to be established to provide overall directional guidance / policies for the fund operation to enable sufficient resources will remain available for the fund to meet its objectives in a long-term and sustainable manner. It is planned to establish the MEEF and MEEF-MC in Q2 2016 and initiate fund application in Q3 2016, subject to the final approval by the DEP.



ANNEX A

Overview of Marine Ecology and Fisheries Enhancement Strategy (MEFES)





A1 OVERVIEW OF THE MARINE ECOLOGY AND FISHERIES ENHANCEMENT STRATEGY (MEFES)

The *Marine Ecology and Fisheries Enhancement Strategy (MEFES)* of the 3RS Project has been set up for the purpose of enhancing the marine environment for the benefit of marine ecology (including Chinese White Dolphins (CWD)) and fisheries resources in the vicinity of the project area, in Hong Kong western waters and further afield into the Pearl River Estuary (PRE). It is also for the purpose of providing support and assistance to affected fishers to achieve more sustainable fishing operations.

It is important to note that the MEFES and associated enhancement and assistance initiatives are not intended to address or directly mitigate impacts identified in the environmental impact assessment (EIA) study as these are already addressed by the specific construction practices, mitigation measures and monitoring programs that will already be implemented for the project. These include the establishment of a new Marine Park, associated management plan and marine ecological and fisheries enhancement measures, and an Environmental Monitoring and Audit (EM&A) programme, which includes extensive CWD monitoring, water quality monitoring and coral translocation efforts at the HKIA seawall.

The main geographical focus of initiatives and measures under the strategy is on North Lantau and Hong Kong western waters but will extend to other Hong Kong waters and PRE.

Initiatives under the MEFES can be grouped into three main categories:

- EIA committed enhancement measures;
- Marine Ecological Conservation Plan (MECP); and,
- Fisheries Management Plan (FMP).

EIA committed enhancement measures are those initiatives which AAHK has committed to progressing and directly funding such as eco-enhancement of seawall design, deployment of artificial reefs and re-stocking of fish fry. Through a different funding mechanism, AAHK will also fund initiatives proposed by third-parties (eg Non-Governmental organisations (NGOs) and researchers) which will form and be under the MECP and the FMP. Further details are provided in the remainder of this Annex.

A1.1 EIA COMMITTED ENHANCEMENT MEASURES

An overview summary of initiatives in the MEFES to be progressed and directly funded by AAHK are as follows:

- ***Implementation of early enhancement measures within the preliminary boundary of the future marine park area and/or near to the future 3RS works***





area. AAHK will define habitat enhancement areas near the project area where enhancement measures are expected to be implemented during the construction phase of the project and these will be the responsibility of AAHK. These may include:

- Restricting SkyPier High Speed Ferries (HSFs) and construction vessels from entering into defined high value habitat enhancement areas / dolphin protection areas under normal circumstances ⁽¹⁾;
 - Development and deployment of artificial reefs ⁽²⁾;
 - Conducting restocking of fish fry and shrimp seedling ⁽²⁾; and,
 - Eco-enhancement design of seawall.
- **Enhancement Studies in Hong Kong Territorial Waters.** AAHK will support enhancement initiatives through:
 - Support for Feasibility Study for Artificial Reef deployment ⁽²⁾
 - Feasibility Study for fish fry stocking ⁽²⁾
 - **Conduct additional voluntary surveillance in Sha Chau and Lung Kwu Chau Marine Park (SCLKCMP).** AAHK will liaise with AFCD and Country and Marine Parks Board to decide the feasibility of supporting reporting of incidents of apparent non-compliance with Marine Park Regulations by other marine users.

A1.2

MARINE ECOLOGY CONSERVATION PLAN (MECP)

AAHK will fund initiatives that support the objectives of the MEFES. The MECP and its funding through the Marine Ecology Enhancement Fund (MEEF) will be administered by a Management Committee set up by the AAHK. Applicants will be able to apply for funding for their initiatives with proposals invited under three overall themes:

- Enhancement of habitats for marine ecology and fishery resources;
- Encouragement of scientific research and studies; and,
- Promotion of environmental education and eco-tourism.

(1) The planned high value habitat enhancement areas / dolphin protection areas were identified during the 3RS EIA approval process and are located to the east of the existing Sha Chau Lung Kwu Chau marine park and in the area to the west of HKIA. Further details on these areas are provided in the Marine Travel and Routes Management Plan for High Speed Ferries of SkyPier and the Marine Travel and Routes Management Plan for Construction and Associated Vessels.

(2) Implementation would be subject to the outcome of feasibility studies.





Should the enhancement studies for Hong Kong Territorial waters identify values for implementing enhancement measures in other Hong Kong Territorial waters, their implementation and future management would also be addressed under the MECP.

A1.3

FISHERIES MANAGEMENT PLAN (FMP)

AAHK will fund initiatives that promote sustainable fisheries for affected fisheries in North Lantau waters. The FMP and its funding through a Fisheries Enhancement Fund (FEF) will be administered by a Management Committee set up by the AAHK. Fishers will be able to apply for funding for their initiatives with proposals invited to:

- Support and enhance on-going fisheries operations;
- Support measures that assist in shifting fisheries operations; and,
- Support the promotion and enhancement of fisheries-related business opportunities.



ANNEX B

Physical Description and Marine Ecological Setting





B1 **PHYSICAL DESCRIPTION AND MARINE ECOLOGICAL SETTING**

B1.1 **INTRODUCTION**

This *Annex* provides a high-level description of the physical and marine ecological characteristics of western Hong Kong waters, in particular north and west Lantau waters. This review provides the basis for identifying key habitats, species or ecological resources that may warrant focused effort in conservation, enhancement and restoration under the MECP. A description on the current planning of the 3RS Project is also presented.

B1.2 **PHYSICAL SETTING**

The 3RS project area mainly comprises approximately 650 ha of land formation in marine open waters and seawall development of approximately 5.9 km immediately north of the HKIA existing platform in the northern Lantau waters. The resulting loss of seabed comprises marine sediment and debris formed from natural sedimentation with the influence of flows from the PRE. The existing seawall is largely constructed of sloping armour rock with the berthing point being constructed of vertical concrete.

The hydrodynamic regime in the western Hong Kong waters is complex and varies with a number of factors including the lunar cycle (spring and neap tides), the season and the rate of flow of the Pearl River. In general, the main ebb tide currents flow south along the Urmston Road, with a subsidiary flow bifurcating northwest of Chek Lap Kok to flow south down the west coast of Lantau, and southeast around the east of Chek Lap Kok Island. Flood tides show the reverse pattern.

The Pearl River, situated in a sub-tropical climate, brings along with heavy loads of suspended sediment and nitrates during wet season and as a consequence concentrations of these parameters within western waters are variable but generally far higher than in the more oceanic influenced waters to the south and east of Hong Kong. As a result of the influence of the Pearl River, water quality of the western waters is characterized by a relatively higher background level of nitrogenous nutrients (in particular Total Inorganic Nitrogen); the water quality is otherwise acceptable with a fair rate of compliance with the Water Quality Objectives.

During the winter (dry) season the influence of the Pearl River is at its least because of reduced flows, resulting in typically well-mixed coastal waters. In contrast during the summer (wet) season, the flow of the Pearl River increases and the coastal waters become highly stratified as the large influx of brackish water overlies the denser, more saline oceanic waters near the seabed.

There are two main channels in the area. One channel extends from the Ma Wan Channel to the Urmston Road with a deepest depth of 22 m near Tap Shek Kok. The





other one which stays south of The Brothers is generally of water depth of 10 m. Other areas in the North Lantau waters are quite shallow and the average water depth is 5 to 6 m. The water depths of west Lantau range from 0 to 22 m

A number of infrastructure developments are planned or underway in western Hong Kong waters with multiple marine users operating. These include the HKIA, Hong Kong Boundary Crossing Facilities (HKBCF), Tuen Mun – Chek Lap Kok Link (TM-CLKL), Hong Kong Link Road (HKLR), contaminated sediment disposal facilities, shipping fairways and vessel traffic routes, anchorage areas, and submarine utilities such as cables, pipelines, seawater intake and effluent outfalls. Marine traffic level is high with high speed ferries, licensed ferry, tankers, bulk carriers, cargo vessels, container vessels, passenger ships, construction vessels (e.g. pilot, tug and tow, barges), government fast launches, fishing vessels and other small craft commonly seen in these waters.

B1.3 *MARINE ECOLOGICAL COMMUNITIES*

In order to better understand how the 3RS Project may have interactions with the marine ecological communities, a series of field studies were conducted between 2012 and 2014 as part of the EIA study. This included focused CWD surveys undertaken over a 12-14 month period, covering the proposed land formation footprint and particularly within the existing Hong Kong International Airport Approach Areas (HKIAAA). The CWD surveys included vessel based line transect surveys, land-based theodolite tracking surveys and underwater noise assessment in the form of passive acoustic monitoring (PAM). In addition to CWD surveys, comprehensive baseline marine ecological surveys specific to the proposed land formation footprint, especially within the existing HKIAAA, were conducted, covering intertidal habitats, sub-tidal habitats, and marine waters. Updated verification surveys were also conducted along the North Lantau coast (from Yam O to the east and Tai O to the west), SCLKCMP and The Brothers. Where appropriate, reference sites with similar ecological attributes to the habitats within the land formation footprint were also surveyed to facilitate ecological evaluation.

B1.3.1 *Chinese White Dolphins (CWD)*

The field surveys yielded important data based on which a full evaluation of the importance of the proposed works area to the CWDs was conducted, with reference to information from previous studies and the results of the current field work directed at assessing impacts within the land formation area and specifically within the current HKIAAA. While the abundance of CWDs within the two surveyed areas (airport north and airport west) was considered to be at the low end of moderate, the densities of dolphins in those areas, based on 12-14 months of data collected, appeared to be similar to those in the known historically important CWD habitats, such as The Brothers area and Southwest Lantau. These densities were much lower than those in the most critical habitat areas of Northwest Lantau and West Lantau; however the Northeast Lantau (covering the proposed land formation footprint) and Southwest Lantau areas were still considered important habitats particularly in the





light of the declining abundance of CWDs in Hong Kong waters. The PAM survey data collected between December 2012 and December 2013 suggested that CWDs may use the areas directly north of the airport more at night than during the day, although the significance of this compared with CWD use in other CWD habitat areas during night-time is not known.

Some CWDs use the airport north and airport west survey areas as part of their general habitat and as a portion of a much larger home range. A variety of activities occur in these areas, although they did not seem to represent prime feeding areas for the CWDs. The data collected appeared to point to those areas being used as important travelling areas between feeding habitats to the east at The Brothers and Sham Shui Kok, and to the west at the SCLKCMP and West Lantau area. Although the value of these focused survey areas was not readily apparent from historical studies of CWDs in Hong Kong, recent changes in habitats (such as the operation of SkyPier resulting in new vessel traffic just north of the airport, on-going intensive construction of the HKBCF directly northeast of the existing airport island and the construction of the HKLR to the west and south of the airport) have potentially resulted in variations in how the CWDs are using the available space. Northwest Lantau and West Lantau remain the major habitats for CWDs in Hong Kong waters where individuals are consistently sighted. An increase of CWDs sighted in coastal water between Fan Lau and Kau Ling Chung in Southwest Lantau was noted in 2013. The Pearl River Estuary Chinese White Dolphin National Nature Reserve (PRECWDNNR) adjoins the HKSAR boundary.

B1.3.2 Intertidal & Subtidal Assemblages

Data from literature review and field surveys were obtained to evaluate the ecological value for the intertidal, subtidal and marine water habitats within the proposed land formation footprint and in the vicinity area. Along the surveyed artificial seawall of the existing airport island, species diversity and evenness were found to be moderate-low, and no intertidal species of conservation importance were recorded. Polychaetes represented the highest species richness and abundance recorded at subtidal soft bottom habitats within the land formation footprint. For subtidal hard bottom habitats, isolated colonies of Gorgonian *Guaiagorgia* sp., which is common in western Hong Kong waters, were recorded with a low coverage along the existing artificial seawall at the north of Chek Lap Kok within the proposed land formation footprint. A cup coral species of conservation importance, *Balanophyllia* sp., was recorded with low coverage at the northeast seawall along the existing airport island outside the land formation footprint. Within the open waters of the land formation footprint, six marine fish species of conservation importance were recorded, all of which were also found outside the footprint, except for the longheaded eagle ray (recorded within the footprint only by trawl survey at a relatively low density). The ecological value of the artificial seawalls along the existing airport island, the subtidal soft bottom and hard bottom habitats, as well as marine waters within the land formation footprint were thus considered in a range from low to moderate-high.





Mangrove and intertidal mudflat habitats along the North Lantau coast at Tai Ho Wan, Tung Chung Bay, San Tau and Sham Wat Wan were identified as important intertidal habitats. The presence of seagrass beds at San Tau and Tai Ho Wan was verified with three seagrass species recorded, and a new locality of *Halophila beccarii* was identified at Sham Wat Wan. A significant number of horseshoe crab juveniles and sub-adults were recorded at Sham Wat Wan, San Tau, Tung Chung Bay and Tai Ho Wan, suggesting that these areas may be part of the nursery grounds of horseshoe crabs in Hong Kong. Eight fish species and one crab species of conservation importance were recorded from intertidal streams along the North Lantau coast, including the spotted seahorse *Hippocampus kuda* and the pipefishes *Syngnathoides biaculeatus* and *Syngnathus schlegeli*.

For the sub-tidal soft bottom habitat, one individual of amphioxus, *Branchiostoma belcheri*, was found at North Lantau outside the land formation footprint, and low coverage of cup coral *Balanophyllia* sp. and ahermatypic coral *Paracyathus rotundatus* were observed within SCLKCMP. For the sub-tidal hard bottom habitat, a low abundance of benthic fauna and low coverage of cup coral *Balanophyllia* sp. were commonly recorded throughout the study area outside of the land formation footprint.

For the open marine water habitats, a moderate abundance of marine fauna was recorded at North of airport island outside the land formation footprint, SCLKCMP and The Brothers, and a total of 20 species of conservation importance (including 17 fish species, one sea snail and two horseshoe crabs) were reported.

B1.3.3 Recognised Sites of Conservation Importance

Four recognised sites of marine conservation importance are found in western Hong Kong waters. These sites included the San Tau Beach SSSI, SCLKCMP, the planned BMP and potential Southwest Lantau Marine Park (SWLMP), which are all outside the land formation footprint of the 3RS Project. The San Tau Beach SSSI is recognised as ecologically importance for the presence of seagrass bed, mangroves and mudflat in the site, whereas the SCLKCMP, BMP and SWLMP are important habitats for the CWDs. These sites of marine conservation importance were considered overall to be of high ecological value.

B1.4 3RS DEVELOPMENT

The 3RS Project will be located on a new land formation immediately north of HKIA in North Lantau. The key project components include:

- Land formation comprising ground improvement, seawall construction and modification (including sea rescue boat points), filling and surcharge activities;
- Construction of new airfield facilities including the third runway, taxiways, aprons, aviation fuel supply network and other airfield infrastructure, aircraft navigational aids, approach lighting system and new HKIAAA marker beacons;





- Modification of existing airfield facilities, including the existing North Runway, taxiways and aprons in the Midfield area;
- Construction of new passenger facilities including the Third Runway Concourse (TRC) and expansion of T2, the automated people mover system and associated depot and maintenance / stabling areas, and the baggage handling system;
- Construction of new ancillary facilities to support the operational needs of the expanded airport, including utility buildings, airport support developments, air cargo staging, catering, aircraft maintenance, aircraft engine run-up (engine testing) facilities, ground service equipment area, early bag storage facility, fire station, fire training facility, petrol fuelling station, new air traffic control towers, Hong Kong Observatory facility, mobile phone system antenna towers, stores, security gate houses, etc.;
- Construction of new and expanded infrastructure and utilities, including road networks, seawater cooling and flushing system, stormwater drainage system, greywater system, sewerage network and potable water supply, Towngas supply, 132 kV / 11 kV and other power supply networks, communication networks, etc.; and
- Diversion of existing submarine infrastructure, including the submarine aviation fuel pipelines and submarine 11 kV cables.


Land formation work is planned to commence in 2016. The tentative programme for the Project is for the 3RS to be operational in 2023. Given the scale and complexity of the project, the construction and concurrent runway operational configuration will be implemented in phases. Some components, such as the TRC, may be constructed in phases based on the level of demand. Due to such phasing arrangements, the three-runway airfield system will be in operation before the full completion of all infrastructure associated with the project.



ANNEX C

Draft Terms of Reference for Marine Ecology
Enhancement Fund Management Committee





Draft Terms of Reference
Marine Ecology Enhancement Fund Management Committee
Pursuant to Condition 2.8 in EIAO Permit Number EP (EP-489/2014)
21 March 2016

Preamble

1. The Committee shall be known as the Marine Ecology Enhancement Fund Management Committee (MEEF-MC).
2. The MEEF-MC is established by the Airport Authority Hong Kong (AAHK) in accordance with Condition 2.8 of Environmental Permit No. EP-489/2014 issued to AAHK on 7th November 2014.
3. The approved EIA for the Project is Register Number AEIAR-185/2014 entitled: Expansion of Hong Kong International Airport into a Three-Runway System.

The outline for the Terms of Reference of the MEEF-MC is as follows:

MEEF-MC Mission

The mission clarifies the overarching MEEF-MC long term goal(s) and duration/life span and is as follows:

The mission of the MEEF-MC is to provide administer the Marine Ecology Enhancement Fund during the Construction and Operation Phases of the 3RS for the successful implementation of the Marine Ecology Conservation Plan (MECP) to promote conservation objectives in a long-term and sustainable manner.

MEEF-MC Objectives

- To advise on and monitor the effectiveness of the proposed enhancement measures of the Project according to the approved Marine Ecology Conservation Plan (MECP) and EIA report; and
- To make recommendations on funding applications that meet the fund objectives and approve the applications that are within the budgeted Annual Allocation.

MEEF-MC Organizational Structure

The MEEF-MC is required to provide oversight of the implementation of MECP and its components, namely:

- Enhancement of habitats for marine ecology and fishery resources (Marine Habitat & Resource Conservation & Enhancement Theme);

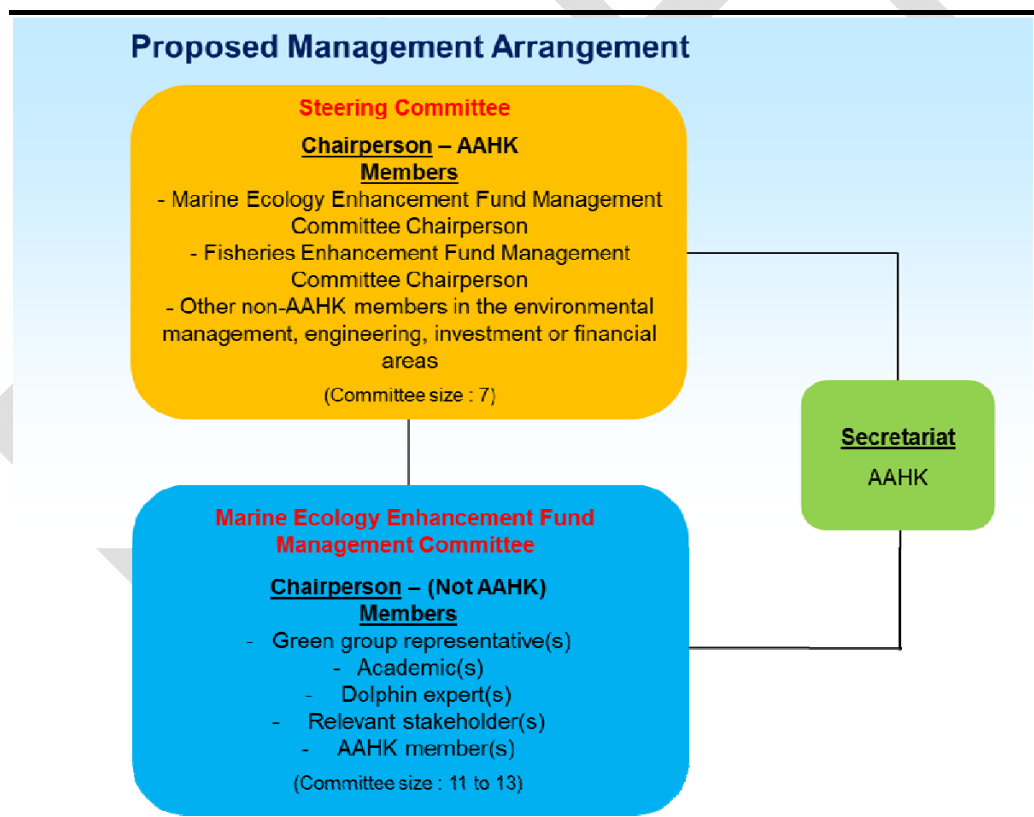


- Encouragement of scientific research and studies (Scientific Research & Studies Theme); and
- Promotion of environmental education and eco-tourism (Environmental Education & Eco-tourism Theme).

The suggested organization is presented in *Figure C1*.

It is important to note that the Steering Committee will provide overall directional guidance / policies for the fund operation to enable sufficient resources will remain available for the fund to meet its objectives in a long-term and sustainable manner covering the MEEF-MC, as well as that of the Fisheries Enhancement Fund Management Committee (FEF-MC) (discussed in a separate submission). The Steering Committee will not override a decision of the MEEF-MC and will not undermine the role of the MEEF-MC.


Figure C1 *Proposed Structure of the MEEF-MC*



MEEF-MC Membership

It is suggested that the membership reflects the three broad themes that will comprise the MECP. The committee will comprise of 11 to 13 members (including the Chairperson), including Green Group representative(s), Academic(s), Dolphin Expert(s), up to 2 representatives nominated by AAHK





and other Relevant Stakeholder(s) including community leader(s) as well as people having expertise / experience in managing similar funds.

Appointment Procedure

The Secretariat of the MEEF-MC will compile a list of potential candidates including, but not limited to, any member of any consultative and advisory committee of the AFCD to be the Chairperson and members of the MEEF-MC that satisfy the composition stated above.

The Secretariat will invite the potential candidate(s) to be Chairperson or member(s) of the MEEF-MC.

The Secretariat will appoint the candidate(s) to be Chairperson or member(s) of the MEEF-MC upon their acceptance. If potential candidate(s) declined the invitation, the Secretariat will propose alternative candidate(s) to ensure that the MEEF-MC would meet the composition requirements stated above.

Each member of the MEEF-MC will be appointed for a fixed term of 3 years, unless otherwise agreed with that member.

The AAHK Role

Whilst it is envisaged that AAHK will not Chair the MEEF-MC, it will provide membership. As the core focus areas of the MEEF-MC are environmental enhancement and community benefit, it is suggested that there will be up to 2 representatives nominated by AAHK on the Committee, which may include the associated specialist / environmental consultant(s).

MEEF-MC Operating Mandate

The operational procedures for the effective functioning of the MEEF-MC include confirming the following:


Frequency of review submissions and meetings

The MEEF-MC will review and advise on submissions related specifically to the MECP. Although there is expected to be one broad plan to kick-off the MECP implementation it is expected that the MECP will in reality consist of a series of submissions under each of the three themes.

The appropriate frequency of meetings will be based on projected submissions that relate to the MECP. The initial suggestion is for half-yearly meetings.

Secretariat Structure, Role & Responsibilities





AAHK will provide secretarial services (or will procure the provision of secretarial services by an external third party) to the MEEF to facilitate the functions of the Steering Committee and the MEEF-MC.

The Secretariat will:

- be responsible for the preparation of meeting notices, agendas, meeting translation and minute taking;
- collate progress reports / final reports submitted by funded projects, as well as the summary of total applications received, successful applications, ongoing projects and completed projects in a year for review and reference by the Steering Committee and the MEEF-MC; and
- work with the AAHK and the Chairperson of the MEEF-MC to ensure proper expertise is present at relevant meetings.

Deliverables of the MEEF-MC

The Secretariat (AAHK or third party consultant appointed by AAHK) will be responsible for the outputs of the committee which will be scheduled on an 'as needed basis' depending on the workload of the committee and these are provisionally identified as follows:

- Briefing papers
- Agendas
- Presentations
- Meeting minutes – list of actions, review outputs
- Comments on submissions
- Materials for upload to dedicated website, if any

Initial half-yearly progress reports matching with the schedule of the MEEF-MC meetings will be prepared by the Secretariat for consideration of the committee. The reports will include updates of implementation and management of the MECP, monitoring and audit of the MECP and findings of any studies carried out under the MECP.

MEEF-MC Implementation / Operation guidelines

To maintain the effective functioning of the committee, guidance notes will be produced for the committee's reference (*Annex 1*).





Annex 1
*Guidance Notes for the Functioning of the Marine Ecology Enhancement Fund
Management Committee*

Introduction

- Mission
- Objectives
- Membership

Make reference to the Terms of Reference for the committee.

Committee Procedure

In order to advise on the effectiveness of enhancement measures contained in the EIA and the MECP, the MEEF-MC will need to be fully informed of what measures are contained within the EIA and related documentation. Upon joining the MEEF-MC each member shall receive soft copies of the following documentation:

- The approved EIA Report for the Project;
- The approved EM&A Manual for the Project;
- The Marine Ecology Conservation Plan;
- Further information submitted under section 8(1) of the EIA Ordinance consisting of Responses to EIASC Members Questions, Supplementary Information in response to 11th August 2014 EIASC Meeting, Supplementary Information in response to 13th August 2014 EIASC Meeting, Supplementary Information in response to 18th August 2014 EIASC Meeting, Supplementary Information submitted before 15th September 2014 ACE Meeting and Presentation material presented at the 15th September 2014 ACE Meeting;
- The 7th November 2014 letter (with attachments) to AAHK from the EPD (Ref No: (1) in EP2/G/B/162 Pt 15) known as “the Director’s Letter” approving the project EIA; and
- The 7th November 2014 Environmental Permit No. EP-489/2014 for the Project.

Committee Members Code of Conduct





A code of conduct guideline will be prepared and agreed on by the MEEF-MC covering:

- Status of membership – voluntary with reimbursement of incidental costs;
- Role and function – review and comment obligations;
- Duration of membership;
- Obligations - internal and external, e.g., confidentiality, media relations etc.;
- Lines of communication; and
- Resignation procedure (notice etc.).

Inaugural meeting to establish the MEEF-MC

The MEEF-MC will be established by holding an inaugural meeting with the following carried out:

- The Terms of Reference will be reviewed and agreed;
- Frequency of Committee meetings and dates discussed;
- The Guidance Notes for the functioning of the committee will be reviewed and agreed and include:
 - Procedures for providing comment on submissions will be discussed; and
 - The overall project scope and programme will be reviewed and Project knowledge and expectations leveled through the Secretariat.



ANNEX D

Potential Initiatives and Performance
Indicators under the Three Key Themes





D1 POTENTIAL INITIATIVES AND PERFORMANCE INDICATORS UNDER THE THREE KEY THEMES OF THE MECP

D1.1 POTENTIAL INITIATIVES

D1.1.1 Marine Habitat & Resource Conservation & Enhancement Theme

An indicative list of example initiatives, which is not intended to be exhaustive, demonstrates the range of opportunities under the MECP and is provided in *Table D1*.

A potential enhancement initiative example is provided in more detail in *Figure D1*.

Table D1 Example Initiatives under the Marine Habitat & Resource Conservation & Enhancement Theme

MARINE HABITAT AND RESOURCE CONSERVATION AND ENHANCEMENT	
PROJECT AREA	<p>Areas outside land formation works</p> <ul style="list-style-type: none"> Deployment of biofilters (Biofilters are specially designed ARs with abundant hard surfaces for development of mainly filter-feeder assemblages for improvement of water clarity. Previous example deployments in Hong Kong include Shum Wan in Sai Kung and Lo Tik Wan at Lamma Island. Other examples include oyster reefs in New York)
	<p>HONG KONG WIDE</p> <p>North Lantau Soft Shores</p> <ul style="list-style-type: none"> Ecological Enhancement Measures for Intertidal Habitat of High Potential Value and Associated Species (San Tau, Tung Chung Bay, Tai Ho Wan, Sham Wat Wan, Yam O) such as through mangrove planting, seagrass restoration and horseshoe crab breeding and release Deployment of biofilters near intertidal habitats to improve water clarity Rehabilitation of the environment near intertidal habitats to improve conditions for mangrove growth and migratory pathways for fish into streams <p>Hong Kong waters</p> <ul style="list-style-type: none"> Baseline Biodiversity Studies to support establishment of other new proposed MP in Hong Kong Baseline Ecological Surveys on CWD for other new proposed MP in Hong Kong Baseline Fisheries Surveys to support other new MP Seascape Studies to understand habitat preferences of CWD in terms of underwater bathymetry and features Hydrology and Water Quality Studies for other new MP Feasibility Study of Artificial Reef Programme within other new proposed MP Feasibility Study of Fish Restocking Programme within other new proposed MP Feasibility Study of Artificial Reef and Fish Restocking in other Hong Kong waters (eg SW Lantau) Eco-enhancement design /retrofitting of jetties in Hong Kong Eco-enhancement design of seawall at other Hong Kong shores Coral translocation/restoration efforts at other Hong Kong waters Ecological enhancement measures such as mangrove planting and seagrass restoration at other Hong Kong waters Control of Invasive Marine Species (eg exotic mangrove and cordgrass species)



Figure D1 Seagrass Restoration Project (Example Initiative Case Study)

Rationale and Objectives

Seagrasses are specialised marine flowering plants. Three species inhabit soft shores in sheltered bays along the North Lantau coast (Japanese Eel Grass *Zostera japonica* and Spoon grasses *Halophila ovata* and *H. beccarii*).

Seagrass communities can play an important role in marine ecosystems. They are highly productive, transferring energy into the marine food web, mainly via their decaying leaves but also via herbivory on their live leaves. They are involved in trapping detritus, cycling nutrients from sediment and providing substrate stability. Their leaves and stems are used as an attachment surface by algae and invertebrate larvae. They serve as nursery and foraging grounds, shelter early life stages of fish and invertebrates such as crustaceans, molluscs and horseshoe crabs.

Given their role in enhancing biological productivity and biodiversity and serving as nursery habitat including for fish, a seagrass restoration project is proposed for habitat enhancement efforts in North Lantau waters. As the only perennial (long-lived) species, *Zostera japonica* will be the subject of the restoration efforts. The species is rare in Hong Kong and disturbance to existing populations will be minimized.

Given the complexities of seagrass restoration, the study will be divided into stages and is expected to involve trials to establish appropriate methods for local situation. The project will be conducted in liaison with AFCD. Objectives are:

- Identify appropriate locations for enhancement by seagrass restoration.
- Establish appropriate methods and protocols.
- Carry out the restoration methods and monitor the success.
- Make the methods and findings publically available.

Schedule and Cost

The project is scheduled to last for
4 years

The estimated cost is
> HK\$ 3.5 million



Japanese Eel Grass *Zostera japonica*

Scope and Methods

The project will involve a number of components including:

- Carry out environmental and seagrass surveys to identify potential donor and receptor sites.
- Review previously used methods for keeping *Zostera japonica* in aquaria and examine feasibility of cultivation.
- Review previous research and translocation works on *Zostera japonica* including in Hong Kong and elsewhere (if available) to develop appropriate methods for seagrass transplantation (eg sediment plug and anchored methods).
- Conduct transplantation of seagrass stock at identified suitable receptor locations in North Lantau.
- Conduct long-term monitoring of the survival and condition of transplanted seagrasses to inform the success of the restoration efforts.



Funding Themes



Habitat Enhancement



Scientific Research and Studies

Outputs

Successful outcome of the project may include:

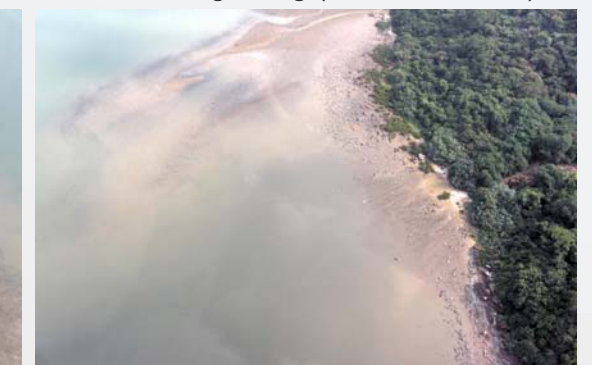
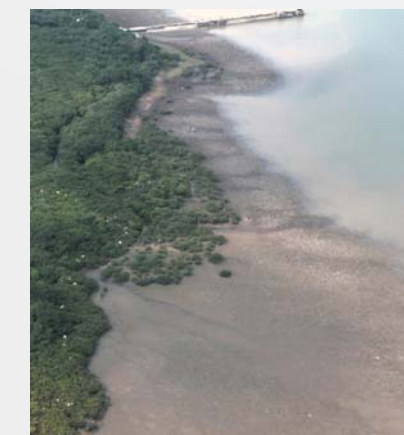
- Development of methods and facilities for seagrass restoration
- Increase in size of *Zostera japonica* beds in Hong Kong western waters
- Establishment of seed populations of *Zostera japonica* in new locales.



Tung Chung Bay



Zostera japonica transplantation in Hong Kong (source: AFCD)



Zostera japonica bed at San Tau



HONG KONG / PRE	PRE waters
	<ul style="list-style-type: none"> ■ Long-term Ecological Surveys on CWDs in PRE waters ■ Baseline Ecological Surveys on CWDs in PRE waters for any future new proposed Marine Protected Area ■ Support for Dolphin Stranding Response initiatives ■ Ecological Enhancement Measures for Intertidal Habitat of High Potential Value and Associated Species such as through mangrove planting, seagrass restoration and horseshoe crab breeding and release ■ Baseline Biodiversity Studies for Marine Protected Areas and Intertidal Habitat of High Potential Value ■ Baseline Fisheries Surveys for Marine Protected Areas ■ Feasibility of Artificial Reef Programme within Marine Protected Areas ■ Feasibility Study of Fish Restocking Programme within Marine Protected Areas ■ Feasibility Study of Artificial Reef and Fish Restocking in Marine Protected Areas ■ Eco-enhancement design of jetties ■ Eco-enhancement design of seawall

D1.1.2 Scientific Research & Studies Theme

An indicative list of example initiatives which is not intended to be exhaustive but rather to demonstrate the potential range of opportunities under the MEFES are provided in *Table D2*.

Some potential research initiative examples are provided in more detail in *Figures D2* to *D3*.

Table D2 Example Initiatives under the Scientific Research & Studies Theme

PROJECT AREA	SCIENTIFIC RESEARCH AND STUDIES
	<ul style="list-style-type: none"> ■ Acoustic studies to evaluate marine construction activities noise impacts ■ Behavioural studies incorporating behavioural observations and acoustic monitoring to monitor the behavioural reactions of dolphins to anthropogenic activities / disturbances
HONG KONG WIDE	<p style="background-color: #e6f2ff; margin: 0;">Western Hong Kong Waters</p> <ul style="list-style-type: none"> ■ Research Programme on Marine Mammals for Western Hong Kong Waters and Wider PRE (population monitoring and behavioural studies) ■ Research Programme on Fisheries Resources for Western Hong Kong Waters and Wider PRE ■ Conduct comprehensive cumulative impact assessment of marine anthropogenic activities ■ Develop and hold a workshop(s) on innovative methods of evaluating cumulative impacts from marine development projects on CWDs ■ Analysis of long-term CWD stranding data to better understand the threats and factors affecting fecundity and survivability of CWD ■ Underwater acoustic monitoring of CWD activities and behavioral studies in the Northwest Hong Kong waters ■ Research to better identify sources of pollution in CWD habitats and make recommendations on appropriate mitigation measures ■ Promote eco-tourism and support NGOs to conduct education programme ■ Artificial seawall performance monitoring to study the effectiveness of the eco-enhancement seawall design in providing suitable habitats for marine fauna re-colonization ■ Modeling Studies of CWD activities and fisheries resources



Figure D2 Fish Spawning and Nursery Study (Example Initiative Case Study)

Rationale and Objectives

Understanding the status of Hong Kong marine waters as spawning and nursery grounds of commercially-important fisheries (fish and crustaceans) species provides valuable information to fisheries managers and planners and the long term monitoring of Hong Kong fisheries resources. Surveys to assess the juvenile fisheries resources (ichthyoplankton and fish post-larvae) spanning all of Hong Kong waters were first conducted in the mid-1990s, with results used to identify nursery and spawning grounds. As part of EIA studies, surveys were later conducted across Hong Kong western waters in the mid-2000s and more recently in North Lantau waters for the 3RS EIA.

A Hong Kong-wide survey on juvenile fisheries resources is proposed. Objectives are:

- Update the status of Hong Kong marine waters as spawning and nursery grounds.
- Make the findings publically available.

Schedule and Cost

The survey programme is scheduled to last for **20 months**

The estimated cost is **HK\$ 3 million**

Funding Themes



Habitat Enhancement



Scientific Research and Studies

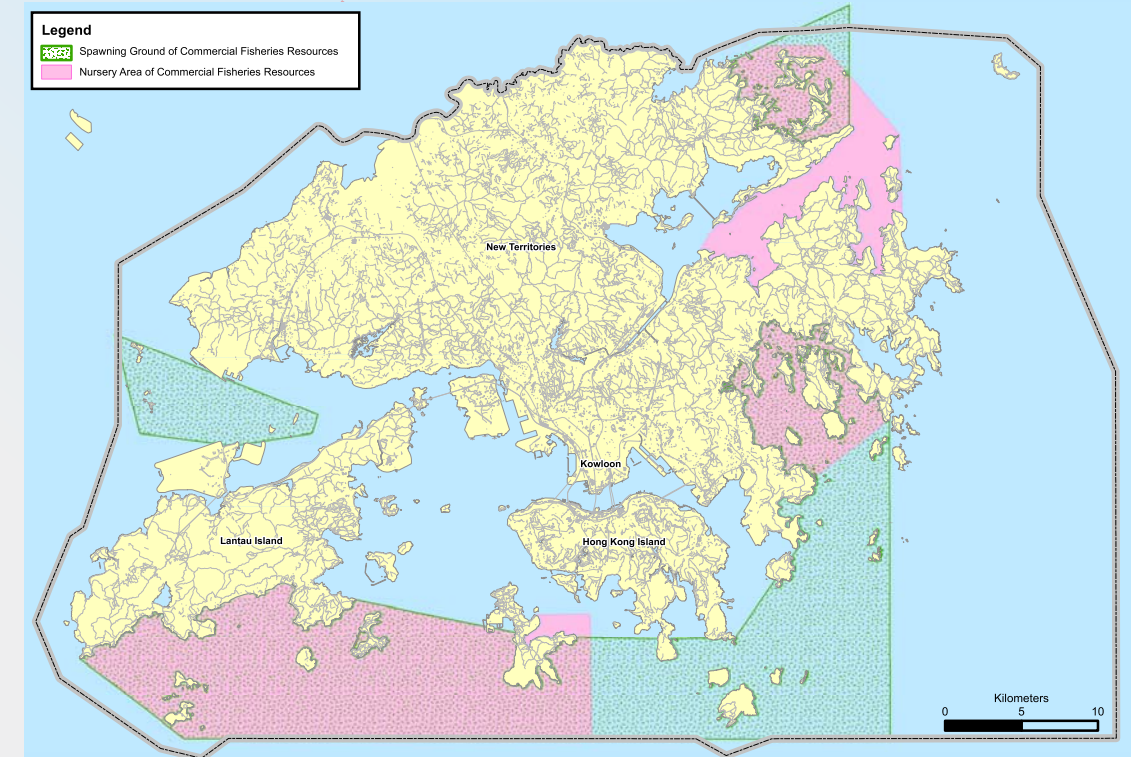


Scope and Methods

The scope of work will be to use standard methodologies to:

Standardized methodology will be used.

- Conduct tows of bongo net with mesh sizes for collection of ichthyoplankton and fish post-larvae from the water column in predefined survey transects in the different regions of Hong Kong.
- Conduct the surveys at intervals throughout the year to capture seasonality.
- Analyse the collected samples for the abundance, composition and diversity of ichthyoplankton and fish post-larvae.
- Review and update the status of Hong Kong waters as nursery and spawning grounds.



Outputs

A variety of outputs could be generated by the study including:

- Species inventories and abundance data
- Analysis of seasonal patterns
- Multivariate statistical analyses to identify biodiversity patterns
- Update on areas of importance to spawning adults and to juvenile stages of commercially important fish and crustaceans.



Figure D3 Coastal Ecology Study (Example Initiative Case Study)

Rationale and Objectives

Corals are most diverse northeast waters of Hong Kong. Other communities or patches of coral occur in southern, southeastern waters with less found in western waters of Hong Kong. In general, the location of main coral areas in Hong Kong are known through various academic and consultancy studies (including AFCD commissioned) but information gaps remain and there is scope to improve the detail of scientific knowledge of the occurrence, distribution and ecological attributes of these communities and associated fish.

A Coastal Ecology Study is proposed for the purpose of contributing to conservation efforts and planning decisions including for use in future EIA studies and coastal management planning as well as long term monitoring purposes. The study will be divided into stages to cover different geographies of Hong Kong using available funding. Objectives are:

- Survey the selected region of Hong Kong including providing coverage of previously unsurveyed coastlines.
- Update information on distribution and status of coral communities.
- Establish fixed sites for long-term monitoring of coral status.
- Characterise the abundance and diversity of fish assemblages at coral areas.
- Make the data publically available.

Schedule and Cost

The survey programme is scheduled to last for **12 months**

The estimated cost is **HK\$ 5 million**

Funding Themes



Habitat Enhancement



Scientific Research and Studies



Education and Eco-tourism



Coral Specialist



BRUVS

Scope and Methods

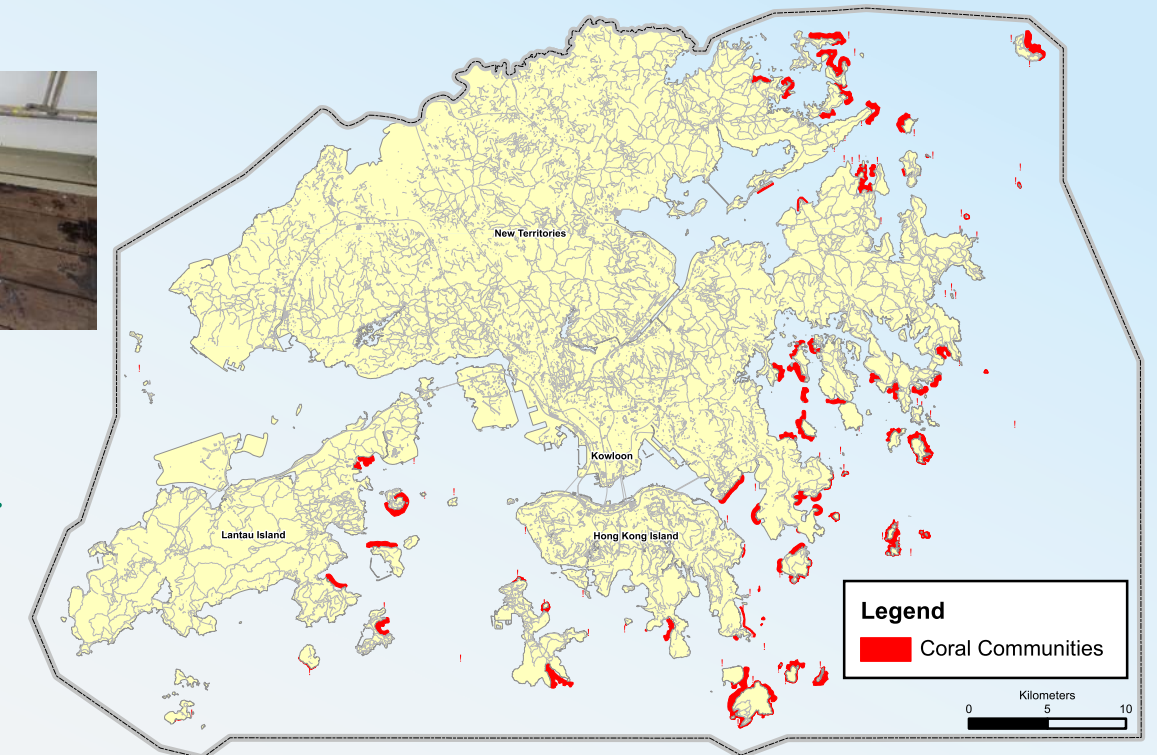
Coral Surveys will be conducted along the coast by coral scientists on SCUBA with underwater cameras, creating a permanent record of observations.

Baited Remote Underwater Video Station (BRUVS) are stationary seafloor camera stations used to attract and record fish. BRUVS can be used at night with lights. BRUVS is a common fish-surveying tool worldwide and increases number of sampling hours compared to diving and records large species which normally avoid SCUBA divers.

Standardized methodology will be used.

- Divers will deployed to desired depth/position, data recording (geo-referenced photo and footage).
- BRUVS deployed for set times.

Imagery is analysed post-survey by coral and fish specialists using Coral Point Count (CPC) software, photogrammetry (3D reconstruction and image mosaicking) software, fish analysis software (eg. SeaGIS software EventMeasure)



Outputs

A variety of outputs could be generated by the study

- Coral diversity
- Coral cover and seabed attributes
- Size frequency distribution of coral populations
- Coral distribution mapping
- Coral health and condition / disease and predators
- Seabed imagery mosaics and models
- Geo-referenced imagery database base
- Shared database
- Statistical analysis to research biodiversity patterns
- Fish diversity
- Fish abundance
- Fish biomass
- Fish Distribution mapping



HONG KONG WIDE

- Research on sediment quality status of North Lantau soft shores

Hong Kong waters

- Research to identify and characterize fish spawning and nursery grounds in Hong Kong waters
- Coastal ecology study on the composition, abundance, distribution and attributes of corals and reef fish in Hong Kong
- Seabed ecology study on attributes, recovery and succession of benthic organisms in Hong Kong waters
- Research on composition, distribution ecological attributes and status of Hong Kong mangrove habitats
- Research on Intertidal and Subtidal Habitats and Species such as Seagrass; Corals; Horseshoe crabs; Estuarine fauna; Marine fishes such as seahorse and pipefish; Amphioxus; Intertidal assemblages at mudflats and mangrove areas; Intertidal assemblages at sandy shore and hard substrates; Subtidal (including both hard and soft substrate assemblages)
- Underwater sound exposure level mapping study of Hong Kong waters
- Study on light attenuation and Photosynthetically Active Radiation (PAR) availability in Hong Kong waters to understand light limitations on benthic primary producers (e.g. corals, seagrass, macroalgae and microphytobenthos)
- Genetic study to research connectivity and larval dispersion patterns (e.g. coral populations)
- Satellite tagging studies on marine mammals or turtles
- Research on octocoral taxonomy and diversity in Hong Kong waters
- Ecotoxicological research on the sensitivity of Hong Kong marine species to spilled hydrocarbons
- Research on effectiveness of Marine Parks (e.g. enhancement of fisheries resources)
- Marine Science Technology Innovation (e.g. Acoustic monitoring of pelagic fish assemblages, Baited Remote Video Stations (BRUVS) for fish surveys, ROV surveys for benthic habitat survey, night vision/thermal imaging for CWD survey, noise modelling)

HONG KONG / PRE

Hong Kong/Pearl River Estuary

- Underwater noise modelling of marine vessel traffic and implications with reference to dolphin and fish hearing and other sensitivities
- Information sharing on CWD studies and status on both sides of HK / PRE border
- CWD Conservation Framework for the PRE including training programme, consultation with relevant researchers, workshops/scientific conference, cumulative impact assessment, action plans to curtail and potentially reverse decline of CWD in Hong Kong and PRE in the form of a conservation strategy (if a decline is identified) and workshops
- Research programme on marine mammals for western Hong Kong waters and wider PRE (population monitoring and behavioural studies)
- Research programme on fisheries resources for western Hong Kong waters and wider PRE

D1.1.3

Environmental Education & Eco-tourism Theme

An indicative list of example initiatives, which is not intended to be exhaustive but demonstrates the potential range of opportunities under the MEFES are provided in *Table D3*.

An education and ecotourism initiative example is provided in more detail in *Figure D4*.



Figure D4 Eco-tourism Project (Example Initiative Case Study)

Rationale and Objectives

Ecotourism is “environmentally responsible travel to natural areas, in order to enjoy and appreciate nature (and accompanying cultural features, both past and present) that promote conservation, have a low visitor impact and provide for beneficially active socio-economic involvement of local peoples” (IUCN Ecotourism Programme 1993 definition). Conducted properly, ecotours can foster an appreciation of nature and encourage people to be more conservation-minded in day-to-day life.

The North Lantau coast has many marine sites of recognized eco-tourism potential for interest local and overseas recreational users. Sites vary in accessibility and suitability for different potential user groups (eg hikers, school groups), ranging from relatively easily accessible (eg Yam O and Tung Chung) to more distant locations that are accessible by longer hikes or by boat (eg San Tau, Sham Wat Wan).

As ecotourism develops in this part of Hong Kong, there is an expressed need to ensure quality eco-educational resources are in place to ensure the success of the visitor experience and low impact of this activity on the environment they come to see. It is proposed to develop innovative eco-educational material to support ecotourism along the North Lantau coast. The project will be conducted in liaison with e-NGOs, tertiary education institutions and educationalists, software developers and in consultation with local residents. Objectives are:

- Identify suitable locations of interpretative signs and panels.
- Develop quality digital media for mobile devices to convey site and conservation information to enrich the visitor experience (eg apps, augmented reality app, QR code accessible multimedia segments).
- Develop eco-educational resources for teachers (eg example lesson plans and nature explorer activity sheets).
- Publicize and make resources freely accessible online.

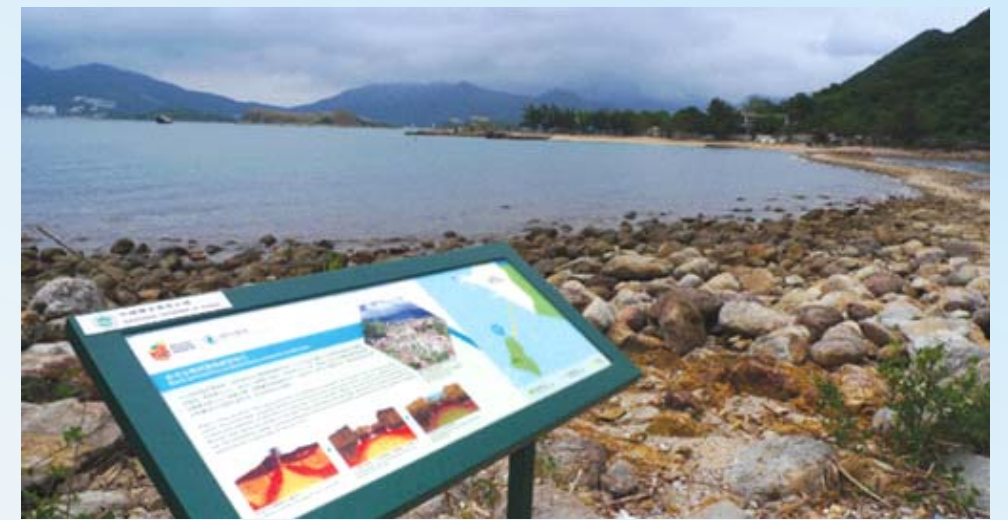
Schedule and Cost

The project is scheduled to last for
2 years

The estimated cost is
HK\$ 2.5 million



Example of Eco-education interpretative board in Australia



Example of Eco-education interpretative board in Hong Kong



Example of Eco-education interpretative board in the United States

Scope and Methods

The project may:

- Develop and deploy interpretative signage (eg ecosystem functioning, species of special interest, commonly-seen marine and bird species, does and don'ts, conservation issues and threats, information on recent infrastructure development projects, heritage values and history etc).
- Develop video and commentary segments on environmental and heritage aspects of sites with QR code signage for on site access.
- Develop apps (eg species identification guide and maps with route guides, augmented reality, does and don'ts etc).
- Provide “nature explorer treasure hunt” points for children activities (eg animal picture etching boards, punch-stamps)
- Provide selected materials in a range of languages – Chinese (Cantonese, Putonghua), English and other Asian languages (eg Japanese, Korean)
- Develop dedicated website.

Funding Themes



Education and
Eco-tourism

Outputs

Successful outcome of the project may include:

- Development of informative and engaging eco-education resources for enhancement of visitor experience on ecotours or private visits.
- Positive reviews of the visitor experience and educational materials

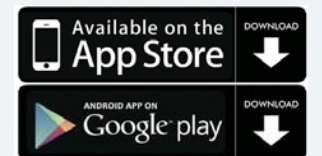




Table D3 *Example Initiatives under the Environmental Education & Eco-tourism Theme*

PROJECT AREA	EDUCATION AND ECO-TOURISM
HONG KONG WIDE	<ul style="list-style-type: none"> ■ Dolphin Stranding Response and Education Programmes ■ Eco-tourism (marine-based) to convey information on marine ecological resources and conservation messages <p>North Lantau coast and Northwest Lantau Waters</p> <ul style="list-style-type: none"> ■ Support AFCD / NGOs to conduct training programmes for frontline protection staff as capacity building on dolphin conservation ■ Skipper Workshop on Dolphin-Friendly Measures ■ Eco-trails / Interpretative Trails Design and Implementation (e.g. routing design considering different user groups, accessibility facility upgrades, landscape planting, trail interpretative boards and signage) ■ Eco-tourism and Eco-trekking Programmes (e.g. guided tours either land-based or marine-based to convey information on marine ecological resource and conservation messages, training activities for capacity building to eco-tour guides) ■ Marine and Coastal Cleanup Campaigns to improve public awareness and cleanup habitats. Marine litter and ecological surveys could be co-conducted ■ Public education programme and publication of education materials (e.g. exhibitions, roadshows, school and outreach programmes, community volunteer programmes and guided eco-tours) ■ Promotion of eco-tourism in the Marine Protected Areas with valid permits and daily quota (e.g., dolphin watching adhering to dolphin watching codes of conduct) ■ Collaborations with AFCD and NGOs to provide training to local dolphin watching tour operators (for example at Tai O) with brochures for visitors to educate them on the code of conduct to be observed during dolphin watching and CWD conservation ■ Development of eco-tourism to raise public awareness on sustainable fishing operations (e.g. development of fisheries museum, arrangement of guided tour for experiencing of fishing operation) ■ Horseshoe crabs breeding and release programme at North Lantau soft shores. ■ Public Education Programme and Publication of Education Materials ■ Dolphin Stranding Response and Education Programmes ■ Adopt a Dolphin Campaign (e.g. receive regular updates about an adopted animal to raise public awareness)
HONG KONG/ PRE	<ul style="list-style-type: none"> ■ Public Education Programme and Publication of Education Materials ■ Collaborations with NGOs to provide training to PRE dolphin watching tour operators ■ Skipper Workshop on Dolphin-Friendly Measures

D1.2 *POTENTIAL PERFORMANCE INDICATORS*

D1.2.1 *Marine Habitat & Resource Conservation & Enhancement Theme*

Some groups of potential performance indicators envisaged at this early stage could include the following:





Baseline Biodiversity Studies

- Completion of baseline monitoring studies and provision of a database of the findings obtained;
- Publication of materials detailing baseline findings and implications on the new Marine Park design and designation; and
- Development and implementation of usage zoning plan and management plan within the new Marine Park and new marine park matrix.

Enhancement Measures Design

- Number of appropriate enhancement measures identified;
- Number of pilot schemes / trials conducted and performance outcomes;
- Number of recommended enhancement measures for full implementation;
- Completion of design of the artificial reef programme and provision of a database of the findings obtained;
- Completion of design of the fish restocking programme and provision of a database of the findings obtained;
- Completion of design of the eco-enhancement of seawall and provision of a database of the findings obtained; and
- Completion of design of ecological enhancement at potential recipient site for coral translocation.

Enhancement Measures Implementation

- Number of enhancement measures fully implemented; and
- Performance outcomes, alterations and recommendations (including longevity, sustainability and success).

D1.2.2 Scientific Research & Studies Theme

Some groups of potential performance indicators envisaged at this early stage could include the following:

- Regular (e.g. quarterly) reporting / presentation of research progress / findings;
- Number of research studies completed;
- Number of publications released from the research studies;





- Number of workshops / trainings / scientific conferences organized and number of participants involved ;
- Number of innovation technologies successfully developed and adopted; and
- Derivation of and regular (e.g. quarterly) progress reports on the implementation of CWD Conservation Framework for the PRE.

D1.2.3 Environmental Education & Eco-tourism Theme

Some groups of potential performance indicators envisaged at this early stage could include the following:

- Number of eco-trails / interpretative trails designed and implemented;
- Number of eco-tourism and eco-trekking programmes completed and number of participants;
- Number of cleanup campaigns completed and number of participants;
- Number of public education programmes completed and number of participants;
- Number of published education materials;
- Number of skipper workshops completed and number of participants;
- Number of frontline staff trainings completed and number of participants;
- For Dolphin Stranding Response and Education Programmes:
 - Reduce response time dolphin stranding;
 - Number of veterinary programmes supported and number of participants;
 - Develop and set up of a centralised laboratory for dolphin necropsy and pathological investigations;
 - Completion of a standardised dolphin necropsy protocol; and
- Number of regional marine mammal stranding response workshops completed and number of participants.

