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ACE-NC Paper 1/2018

For discussion on 30 April 2018

Progress of Implementation of Nature Conservation Management Agreement Projects

PURPOSE

This paper seeks to update Members on the latest progress of implementation of two Management Agreement (MA) projects at Sai Wan Enclave and Fung Yuen Priority Site.

BACKGROUND

2. In 2015, under the Nature Conservation Management Agreement Scheme, the Environment and Conservation Fund (ECF) Committee approved funding for the Sai Kung District Community Centre (SKDCC) and the Environmental Association Limited (EA) to implement, respectively, the MA projects “Rehabilitation Project for Sai Wan Area” (Sai Wan MA Project) and “Management Agreement on the Private Land with High Conservation Value at Fung Yuen Valley Site of Special Scientific Interest in Tai Po, Hong Kong” (Fung Yuen MA Project).

THE CURRENT MA PROJECTS

Sai Wan MA Project

3. The Sai Wan enclave was designated as part of the Sai Kung East Country Park in December 2013. The MA project is the first of its kind at country park enclaves and provided incentive to encourage conservation of private land in country parks as well as that in country park enclaves. It aims to revitalise Sai Wan through the concerted efforts of relevant stakeholders and the rural community to conserve the ecological habitats and showcase the cultural uniqueness of the area. The project covers rehabilitation of abandoned agricultural land, habitat management as well as public education programmes.

4. The Nature Conservation Subcommittee under the Advisory Council on the Environment (ACE-NCSC) supported this project after discussion at its meeting on 10 December 2015, and advised the following:

- (i) Steering Committee – the SKDCC should set up a steering committee to oversee and provide steer to the project. The steering committee should comprise relevant stakeholders and experts / practitioners / academics in the relevant field.
- (ii) Management Plan – in view of the possible user impact to Sai Wan from increased visitors as a result of the project, the SKDCC should prepare a site management plan for the Sai Wan area (e.g. core zone for areas susceptible to increased visitors, activity zone for high intensity use, etc.).
- (iii) Baseline Ecological Monitoring – to better understand the baseline ecological condition of Sai Wan, and its possible changes before and after the project, the SKDCC was advised to carry out regular ecological monitoring at Sai Wan.
- (iv) Questionnaires – to better understand the awareness and behavioural change of villagers, volunteers and visitors towards biodiversity conservation, the SKDCC should prepare and conduct questionnaires to understand the conceptual change of villagers and behavioural change of volunteers and visitors in this project.
- (v) Volunteer Programme – the SKDCC was suggested to develop a long-term and sustainable volunteer programme with a view to raising the awareness of the public in biodiversity conservation.

Fung Yuen MA Project

5. The current project is a continuation of previous projects conducted by EA in partnership with the local community since November 2005, with an aim to conserve and enhance the butterfly habitats in Fung Yuen. Under these MA projects, a range of conservation measures including planting of suitable larval food plants and nectar plants for butterflies, vegetation management, and species monitoring are being conducted, and education activities targeting different sectors of the community are also organised.

6. The ACE-NCSC supported the application of the current MA project at the meeting on 10 December 2015, and advised the following:

- (i) Questionnaires – to better understand the awareness and behavioural change of the local community, volunteers and visitors towards biodiversity conservation, the EA should prepare and conduct questionnaires to understand the conceptual change of the local community and behavioural change of volunteers and visitors in this project.

- (ii) Reporting – the EA was suggested to include in the reports observation on implementation of the project and management of the Fung Yuen area from a holistic / strategic angle.
- (iii) Interface with nearby residential development – the nearby residential development and Fung Yuen Butterfly Reserve was considered a good example in demonstrating the interface between development and biodiversity conservation. The EA was suggested to provide relevant data in the reports.
- (iv) Focal Activities / Programmes – to make effective use of resources, the EA was advised to review and prioritise its work plan / programmes, and identify focal activities / programmes for the project.

7. Upon considering the views of the ACE-NCSC, the ECF Committee granted respectively \$9,457,730 to SKDCC in November 2016; and \$8,920,455.71 to EA in January 2016 for implementing the MA projects. A summary of these two approved projects is at **Annex A**.

PROGRESS OF THE MA PROJECTS

8. At the ECF Committee meeting on 4 December 2012, it was recommended that recipient organisations should report the progress of the ongoing MA projects regularly to the ACE-NCSC for better monitoring of the projects. In this regard, the SKDCC and the EA have prepared responses to set out in detail the efforts taken to fulfil ACE-NCSC's recommendations for the funding requirements (**Annexes B-1 and B-2**), and reports to summarise the progress of implementation of the projects to date, including the latest findings of the biodiversity surveys, education and publicity works, problems encountered as well as remedial measures taken to overcome problems and their effectiveness (**Annexes C-1 and C-2**).

ADVICE SOUGHT

9. Members are invited to give views on the implementation and progress of the MA projects.

Agriculture, Fisheries and Conservation Department
Environmental Protection Department
April 2018

Summary of the Sai Wan MA Project (2017-2020)

Project Title	Rehabilitation Project for Sai Wan Area
Proponent	Sai Kung District Community Centre (SKDCC)
Management Areas	About 0.58 ha
Duration	36 months (from 15 February 2017 – 14 February 2020)
Project Description	The project aims to revitalise Sai Wan through the concerted efforts of relevant stakeholders and the rural community to conserve the ecological habitats and showcase the cultural uniqueness of the area.
Key Conservation Objectives	<ul style="list-style-type: none"> - To rehabilitate abandoned agricultural land for wildlife use; - To preserve and protect key habitats and associated flora and fauna; - To enhance habitat for butterflies; - To engage local villagers in conservation and site management works; and - To promulgate nature conservation, revitalisation of cultural heritage and eco-tourism.
Key Project Activities	<ul style="list-style-type: none"> - To rehabilitate abandoned agricultural land for organic farming to support wildlife use; - To preserve and manage the existing seasonal wetland; - To enhance habitats specifically for butterflies; - To actively manage key habitats including removal of invasive plant species, planting of mangroves and litter collection; - To renovate a historical well and village houses to serve as information centre and workshops; and - To carry out education programmes including workshops and guided tours targeted to students and general public, as well as other publicity programmes.
Funding Approved	\$9,457,730

Summary of the Fung Yuen MA Project (2016-2019)

Project Title	Management Agreement on the Private Land with High Conservation Value at Fung Yuen Valley Site of Special Scientific Interest (SSSI) in Tai Po, Hong Kong (2016-2019)
Proponent	The Environmental Association Limited (EA)
Management Areas	About 1.9 ha
Duration	36 months (from 1 February 2016 – 31 January 2019)
Project Description	This project aims at conserving and enhancing the natural habitats of butterflies in the Fung Yuen valley SSSI through management agreements with local landowners.
Key Conservation Objectives	<ul style="list-style-type: none"> - To reduce and minimise environmentally incompatible behavior on private land in Fung Yuen; - To enhance and maintain the habitat quality of private land in Fung Yuen; - To provide a refuge area for butterfly foraging, inhabiting, and breeding, so as to conserve and enhance the butterfly diversity; - To train volunteers in conservation programmes; - To provide up-to-date ecological information and formulate strategies for long-term management in the area; and - To promote nature conservation awareness of the general public.
Key Project Activities	<ul style="list-style-type: none"> - Site safeguard and ecological monitoring programme; - Habitat management including removal of invasive weeds and planting of butterfly larval food plants and nectar plants; - Species conservation programme; and - Education and publicity programmes including monthly and annual Butterfly Festivals, outreach booths, conservation workshops etc.
Funding Approved	\$8,920,455.71

SKDCC's Responses to the Recommendations of the ACE-NCSC

- (i) ***Steering Committee – The SKDCC should set up a steering committee to oversee and provide steer to the project. The steering committee should comprise relevant stakeholders and experts / practitioners / academics in the relevant field.***

The SKDCC has set up a steering committee to oversee and steer the implementation of the project. The steering committee comprises representatives from Sai Wan Village, Heung Yee Kuk, AFCD, Working Group on Sai Wan Management under the Country and Marine Parks Board, EA, Conservancy Association, Hong Kong Hiking Association, China, Chinese University of Hong Kong and Hong Kong University of Science and Technology. The steering committee held two meetings on 10 February and 14 December 2017. At the meetings, SKDCC reported the progress and planned work of the project to the steering committee. Members gave positive comments to the implementation work and provided advice on the future work.

- (ii) ***Management Plan – In view of the possible user impact to Sai Wan from increased visitors as a result of the project, the SKDCC should prepare a site management plan for the Sai Wan area (e.g. core zone for areas susceptible to increased visitors, activity zone for high intensity use, etc.)***

The SKDCC will devise a management plan for the Sai Wan area taking into account the findings of baseline ecological survey, distribution of rare floral and/or faunal species recorded as well as planned activities in the area. The core area of rare plants recorded in the project area will be fenced off to restrict human access.

- (iii) ***Baseline Ecological Monitoring – to better understand the baseline ecological condition of Sai Wan, and its possible changes before and after the project, the SKDCC was advised to carry out regular ecological monitoring at Sai Wan.***

Baseline ecological survey in Sai Wan area was conducted on 19 April 2017. Species of various taxa groups (including bird, fish, butterfly, dragonfly, amphibian, reptile and plant) in Sai Wan area were recorded using methods of transect count, point count and active searching. Ecological monitoring was also carried out on 6 December 2017 and will be conducted quarterly in the coming wet and dry seasons.

- (iv) ***Questionnaires – to better understand the awareness and behavioural change of villagers, volunteers and visitors towards biodiversity***

conservation, the SKDCC should prepare and conduct questionnaires to understand the conceptual change of villagers and behavioural change of volunteers and visitors in this project.

The SKDCC has prepared questionnaires for gathering feedback from participants of guided tours and school programmes in order to better understand the change of public awareness towards biodiversity conservation. The SKDCC will organise publicity activities and education programmes together with questionnaire surveys in coming months.

- (v) *Volunteer Programme – the SKDCC was suggested to develop a long-term and sustainable volunteer programme with a view to raising the awareness of the public in biodiversity conservation.*

The SKDCC has organised two volunteer activities on 1 August and 8 December 2017. The volunteers carried out remedial works on eroded stream banks near the rehabilitated agricultural land and assisted in farming activities. To raise public awareness in biodiversity conservation, the SKDCC will further recruit volunteers to support the implementation of the project in respect of ecological monitoring, rehabilitation of abandoned agricultural land and clean-up of the beach at Sai Wan.

**Sai Kung District Community Centre
April 2018**

EA's Responses to the Recommendations of the ACE-NCSC

- (i) *Questionnaires – to better understand the awareness and behavioural change of the local community, volunteers and visitors towards biodiversity conservation, the EA should prepare and conduct questionnaires to understand the conceptual change of the local community and behavioural change of volunteers and visitors in this project.*

Survey by interview to understand the needs and feedback of participants has been conducted. The survey results are as attached (**Appendix 1 and 2**).

- (ii) *Reporting – the EA was suggested to include in the reports observation on implementation of the project and management of the Fung Yuen area from a holistic / strategic angle.*

Butterflies exhibit high host plant specificity and require sufficient food for successful larval development. We found a strong positive relationship between butterfly population density and abundance of their associated host plants. Various native larval plants for targeted butterfly species have been introduced in Fung Yuen to increase its population carrying capacity. Invasive species such as *Mikania micrantha* and *Wedelia trilobata* have been removed regularly to avoid competition with native plants. The butterfly reserve at Fung Yuen has been enhanced with active management and proactive planting.

Zoning plan according to different conservation targets can allow for controlling different levels of human disturbance. Fung Yuen Butterfly Reserve has been divided into open zone (Phase I & Phase II) and protected zone (Phase III). With controlled human activities, ecological restoration allows for successional development in the restricted core zone area in Phase III. Adaptive management in open zone with the reintroduction of heterogeneity of species on disturbed lands of Phase I and Phase II have been proved effective in supporting increasing abundance and richness of butterfly species. The zoning allows the balance between human needs and conservation objectives in the management area.

Involvement of different stakeholders is important as well. With limited human and financial resources, Fung Yuen Butterfly Reserve has the support from local communities, visitors, academics, experts and volunteers. The advisory and management committees provide technical advice for conservation management plans and habitat management

suggestions. Village representative and elderly villagers have been consulted on the history of the managed area, and native plants species to be planted. Local villagers have been employed as part-time staff to foster communication and understanding with the local communities. Community involvement serves both as resources and support from the public in conservation programs. Voluntary groups including specific targets groups have been involved in habitat management at a weekly basis to support various planting exercises in the reserve.

(iii) Interface with nearby residential development – the nearby residential development and Fung Yuen Butterfly Reserve was considered a good example in demonstrating the interface between development and biodiversity conservation. The EA was suggested to provide relevant data in the reports.

Fung Yuen Butterfly Reserve has cooperated with the property management office of Mount Vert and Fung Yuen Village. For educational purpose, such cooperation allow the residents to know the goals and operation of the reserve. Educational programs include open days, family fun days and family farming programs. During the 2016-2018, more than 500 residents had actively participated in these programs. This allowed better communication with the residents about basic knowledge of biodiversity and difficulties that the reserve encountered. Some residents joined the reserve as volunteers after “experimental” programs and committed themselves as volunteers for supporting the reserve.

(iv) Focal Activities / Programmes – to make effective use of resources, the EA was advised to review and prioritise its work plan / programmes, and identify focal activities / programmes for the project.

Enhancement in habitat management and education programmes targeting families and the elderly would be the key focus in order to enlist support for the enhancement in habitat management. Nursery facilities for native plants have been established, which allow the reserve to grow native plants using seedlings of higher quality against invasive species or pathogens. A total of 6 811 larval plants of 165 species have been planted in the reserve with the support of volunteers. These plants are mainly larval host plants and nectar plants for butterfly species. Additional funding from HSBC is secured to support training for “golden age” senior volunteers with the theme of butterfly-plant relationship. In view of their energetic power and that they still stay active after retirement, these targeted groups enrich the capacity and voluntary support to the reserve. Family programs particularly workshops with direct experience of nature have been conducted. Families with children aged below 10 have huge interest in joining such programs with more than 300 participants.

Environmental Association Limited
April 2018

SKDCC's Summary of the Progress of the Sai Wan MA Project
From 15 February 2017 to 14 February 2018

Objectives

- To rehabilitate abandoned agricultural land;
- To preserve and protect key habitats and associated flora and fauna;
- To enhance habitat for butterflies;
- To engage local villagers in conservation and site management works; and
- To promulgate nature conservation, revitalisation of cultural heritage and eco-tourism.

Implementation Progress of the Project

Baseline ecological survey

- Baseline ecological survey in Sai Wan area was conducted on 19 April 2017. Using transect count, point count and active searching, a total of 22 birds, 19 fish, 17 butterflies, 5 dragonflies, 3 amphibians and reptiles, and 200 plant species were recorded in Sai Wan area. Most of the recorded species are common and widespread in Hong Kong. The small populations of locally rare *Maackia australis* (華南馬鞍樹) and *Podocarpus macrophyllus* (羅漢松) in the abandoned agricultural land within the project area will be preserved in-situ as appropriate.
- The SKDCC conducted ecological monitoring on 6 December 2017. Further ecological monitoring will be conducted quarterly in the coming wet and dry seasons.

Rehabilitation and habitat management

- Rehabilitation of abandoned agricultural land commenced in April 2017. Since the land had been abandoned for years, the early stage of rehabilitation work mainly involved general site clearing, setting up field plots and fences, improving soil fertility and drainage condition as well as growing dry crops (e.g. sweet potatoes and corns). SKDCC planned to cultivate rice in 2018.
- To facilitate further rehabilitation work, the SKDCC was in the process of applying for the construction of agricultural structures to store farming equipment and support organic farming activities and workshops for participation of the public. The SKDCC started rehabilitation of the remaining agricultural land in January 2018.
- Nectar and/or larval food plants for butterflies were also planted in the project area to further enhance wildlife habitats in Sai Wan area.

Renovation of visitor information centre and restoration of old well

- Since the launch of the project, the SKDCC has been preparing tender documents for renovation of the information centre and restoration of the old well at Sai Wan. Two rounds of tendering exercises were carried out in June and August 2017. In the first tendering, a total of 11 companies expressed interest in the job but only two of them submitted tenders by the deadline. One of the tenders was subsequently withdrawn due to unexpectedly high transportation cost for construction materials to the remote area while the other one was not accepted due to exceptionally high price. In the second tendering, only one tender was received and finally accepted. The renovation of visitor information centre was completed at the end of January 2018.

Local engagement

- Sai Wan villagers have been actively participating in the implementation of the project. Two villagers served as advisors of the project and assisted in gathering information of Sai Wan Village including its history, rural lifestyle, natural environment and ecology, traditional etiquette and other cultural aspects. They provided valuable information and ideas on the design of the visitor information centre and the relevant exhibition.
- The SKDCC will recruit local villagers to work as site management staff, tour guides and tutors of the workshops in order to foster villagers' participation and collaboration in the conservation of cultural heritage and biodiversity.

Education and publicity

- Based on the cultural and ecological information gathered, the SKDCC will organise educational tours and workshops for schools and general public.
- A thematic website was launched in November 2017 to provide background information of the project, latest news, activity highlights, coming activities and enrolment method.
- The visitor information centre was opened on 5 February 2018. It exhibits the history, rural lifestyle, cultural relics and ecology in Sai Wan area, and will also serve as the venue for educational activities and workshops for the public.

Difficulties Encountered & Remedial Measures

- Due to remoteness of Sai Wan and limited public transport, it is difficult to employ two full-time farmers as proposed in the application. Instead, the SKDCC employed one full-time farmer and two part-time farmers within the approved budget for this expenditure item.
- The SKDCC also encountered difficulty in the procurement of renovation

work for the visitor information centre due to unexpectedly high transportation cost for construction materials in the remote area. The first tendering in June 2017 was unsuccessful. In the second tendering in August 2017, only one tender was received and finally accepted. Renovation of the visitor information centre was eventually completed at the end of January 2018.

- Rehabilitation of agricultural land was affected by adverse weather conditions in summer and disturbance of feral cattle. The rehabilitated field was flooded after heavy rain or high tide period. Water channels were constructed to improve drainage condition in the field. Fences and nets were also installed to prevent feral cattle from entering the cultivated field.

Sai Kung District Community Centre
April 2018

EA's Summary of the Progress of the Fung Yuen MA Project
From 1 February 2016 to 31 January 2018

Objectives

- To reduce and minimize the incidence of any irregularity and environmentally incompatible behaviour on the private land in Fung Yuen Valley Site of Special Scientific Interest (FY SSSI);
- To enhance and maintain the habitat quality of private land in FY SSSI as an important site to butterflies;
- To enhance and maintain the diversity of butterfly species in FY SSSI;
- To ensure providing a refuge area to butterfly's foraging, inhabiting and breeding in FY SSSI;
- To train and develop volunteer involvement and capacity building of nature personnel;
- To promote the New Nature Conservation Policy and the importance of conservation to local community in Fung Yuen and Tai Po District, students and general public of Hong Kong, and extend to overseas visitors and scholars;
- To review ecological monitoring data for adaptive management of the Fung Yuen Butterfly Reserve (FYBR); and
- To enhance the long-term sustainability of the proposed conservation project by undertaking more revenue-generating activities and exploring marketing opportunities in the FYBR.

Management Area

- Currently, around 1.9 ha of private land in Fung Yuen is under active management by EA. The management area cover abandoned agricultural fields in Areas A and B, fruit garden in Area C, as well as the FYBR centre and associated woods. An area of 0.2 ha of private land is under negotiation with the landlord for a reasonable rent.

Area	Approximate area (ft ²)	Habitat type
Area A	34,306.80	C (80%) & F (20%)
Area B	34,781.60	C (90%) & F (10%)
Area C	130,000	F (100%)

FYBR Centre and woods	10,000	/
Total	209,088.40	C (34%) & F(66%)

Note: C – abandoned croplands; F – abandoned orchards

Biodiversity Conservation Management

Monthly Butterfly Monitoring (Feb 2016 - Jan 2018)

- Butterfly surveys were carried out monthly and led by local butterfly expert Mr. PUN Sui Fai. Both species number and abundance were investigated inside the Fung Yuen Butterfly Reserve and adjacent Koo Ka Yuen woodland.
- Generally butterfly species were more abundant inside Reserve Phase 1 (Area B) as more nectar plants were planted and maintained in the area thus attracting many butterfly species. Less butterfly individuals were recorded in Koo Ka Yuen area (Area A) as the area is not actively managed and less attractive to butterfly adults that favor nectar plants. Large number of Satyrinae (眼蝶亞科) species were recorded in Koo Ka Yuen as they favor habitats shaded woodland.
- Four new species, *Hasora anura* (無趾弄蝶), *Papilio dialis* (穹翠鳳蝶), *Pseudoborbo bevani* (擬袖弄蝶) and *Parantica melaneus* (黑絹斑蝶) were recorded in 2016 (Table 2). One new species, *Pithecops corvus* (黑丸灰蝶) was recorded in 2017. We had consistently found new species every year and a record high of five new species in 2015. Table 2 shows the new species found in FYBR from 2010 till now.

Year	Scientific Name	Chinese Name
2010	<i>Pelopidas subochraceus</i>	近赭穀弄蝶
2010	<i>Aeromachus jhora</i>	寬鏢弄蝶
2011	<i>Caltoris bromus</i>	無斑珂弄蝶
2011	<i>Euthalia niepelti</i>	綠裙邊翠蛺蝶
2012	<i>Lethe chandica</i>	曲紋黛眼蝶
2012	<i>Catochrysops strabo</i>	咖灰蝶
2013	<i>Phalanta phalantha</i>	珐蛺蝶
2013	<i>Catochrysops panormus</i>	藍咖灰蝶
2014	<i>Notocrypta paralysos</i>	窄紋袖弄蝶

2015	<i>Udara dilecta</i>	珍貴嫵灰蝶
2015	<i>Dodona egeon</i>	大斑尾蛺蝶
2015	<i>Megisba malaya</i>	美姬灰蝶
2015	<i>Colias erate</i>	斑緣豆粉蝶
2015	<i>Prosotas nora</i>	娜拉波灰蝶
2016	<i>Hasora anura</i>	無趾弄蝶
2016	<i>Papilio dialis</i>	穹翠鳳蝶
2016	<i>Pseudoborbo bevani</i>	擬袖弄蝶
2016	<i>Parantica melaneus</i>	黑絹斑蝶
2017	<i>Pithecops corvus</i>	黑丸灰蝶

Monthly Amphibian and Reptile Monitoring (Feb 2016 – Jan 2018)

- Night-time survey of amphibians and reptiles was conducted monthly by staff to study the species richness in the area. The survey area covered the same area of the butterfly survey (i.e. Koo Ka Yuen, Reserve Phase I and Phase II). Number of species and their abundance were recorded. A total of 13 species of amphibians and 21 species of reptiles were recorded during Feb 2016 - Jan 2018. Most species found were common species, except Banded Wolf Snake which is listed as uncommon species by AFCD's Hong Kong Biodiversity Database.

Quarterly Bird Monitoring (Feb 2016 – Jan 2018)

- Bird surveys were carried out by the Hong Kong Bird Watching Society to investigate the species richness and abundance of birds in Fung Yuen Road, Fung Yuen Village and SSSI Area once every three months for a period of 12 months.
- Area along Fung Yuen Road recorded more bird species and individuals while area of Fung Yuen Lo Wai and Mak Uk had the lowest records of bird species and individuals.
- The highest species richness and abundance were obtained in winters, with high diversity of winter visitors. It indicates that Fung Yuen is an important habitat for wintering of birds.
- 5 new species were recorded during the reporting period:

Year	Scientific Name	Chinese Name
2016	<i>Emberiza sulphurata</i>	硫磺鷓
2016	<i>Centropus bengalensis</i>	小鴉鵂
2016	<i>Ficedula parva</i>	紅胸姬鵂
2016	<i>Dicaeum ignipectus</i>	紅胸啄花鳥
2017	<i>Butastur indicus</i>	灰臉鵟鷹

- Bird species observed including *Pycnonotus jocosus* (紅耳鸚) feeding on tangerine planted and *Aethopyga christinae* (叉尾太陽鳥) sipping nectar from nectar plants in the Reserve, showing that an actively managed area is beneficial to the bird population as it provides a foraging site for them to breed locally.

Plant Survey (Feb 2016 - Jan 2018)

- The components of the dominant original vegetation in Hong Kong were mainly evergreen broadleaf species, with Fabaceae (蝶形花科), Rubiaceae (茜草科), Euphorbiaceae (大戟科), Lauraceae (樟科), Fagaceae (殼斗科), Moraceae (桑科) and Theaceae (山茶科) believed to be the major families in the original natural vegetation of tropical semi-evergreen forests. These families had higher species and tree abundance in Fung Yuen, indicating the plant composition is originally natural. Many of them are also butterfly food plants for example Lauraceae (樟科), Magnoliceae (木蘭科) and Rutaceae (芸香科) are the host plants for Papilionidae (鳳蝶科), Fabaceae (蝶形花科) for Pieridae (粉蝶科) and Lycaenidae (灰蝶科), while Poaceae (禾本科) is the host plants for Hesperidae (弄蝶科) and Satyrinae (眼蝶亞科).
- Some of the newly discovered species could be accounted by the presence of their relating larval food plants as follow:

New species in the last 5 years	Corresponding food plant	Location
<i>Hasora anura</i> (無趾弄蝶)	<i>Millettia nitida</i> (亮葉崖豆藤)	Area B
<i>Notocrypta paralysos</i> (窄紋袖弄蝶)	<i>Hedychium coronarium</i> (薑花)	Areas B / C
<i>Pseudoborbo bevani</i> (擬袖弄蝶)	<i>Ischaemum aristatum</i> (鴨嘴草)	Area B / C

<i>Papilio dialis</i> (穹翠鳳蝶)	<i>Tetradium glabrifolium</i> (棟葉吳茱萸)	Areas B
<i>Pithecopis corvus</i> (黑丸灰蝶)	<i>Hylodesmum laterale</i> (側序長柄山螞蝗)	Area B / C

- Reserve Phase 1 (Area B) had the most species of woody and herbaceous plants, while Koo Ka Yuen Area (Area A) recorded the lowest for both plant types.

Habitat Management

- During the reporting period (1 February 2016 – 31 January 2018), a total of 6,811 butterfly larval food plants and nectar plants of 165 species were cultivated within the reserve area by the volunteers and staff.
- Weed removal was conducted daily by staff and volunteers during the reporting period.

Education and publicity works & Proposed Actions

Program	Target no.	Total no.	Completion
Weekly habitat management volunteer programme	156 programmes	287 programmes (1,102 volunteers)	184%
Delivering habitat management workshops (Each workshop for 30-50 participants)	90	54	60%
Butterfly garden outreaching programme to introduce butterfly garden in schools	-	10 gardens	-
Delivering species conservations workshop programme (Each workshop for 30-50 participants)	90	53	58%
Running of advisory committee meetings	5-6	4	80%

Running of management committee meetings	6-8	4	67%
Production of conference	1	Dec 2018	-
Production of leaflet	20,000	5,000	25%
Book about FY	2,000	Dec 2018	-
Production of butterfly festival	1	2	200%
Monthly butterfly festival	36	24	67%
Display panels & exhibition	10 or more	28	280%
Outreaching booths	48	37	77%

Difficulties Encountered & Remedial Measures

- Facing inflation and the rise of land cost in Hong Kong, the landlords had requested for higher rent of the farmlands and education center. We had several rounds of discussion with the landlords for reasonable rents. Staggering cost of materials, equipment and facilities create a huge burden to the Reserve for operation. Additional funding resources will be needed to further develop the program.
- There was a high turnover rate of experienced staff in view of the comparatively low salary and welfare as compared to the current rate in the job market in Hong Kong. We had contacted local universities to introduce Fung Yuen to undergraduate students for new recruitment.

Environmental Association Limited
April 2018