

**Agreement No. CE 61/2020  
(SP)  
Ecological Surveys and  
Studies for San Tau to Sham  
Wat, Yi O and Shap Long –  
Feasibility Study**

Executive Summary (Final)

November 2023



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Department

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# 1 Introduction

## 1.1 Background

The Sustainable Lantau Blueprint (the Blueprint) mapped out the principle of “Development in the North, Conservation for the South”. It was stated in the Blueprint that the predominant part of Lantau, particularly in the South, would be for conservation, leisure and recreation uses. The Blueprint also put forward a number of conservation initiatives including conservation of important habitats in Pui O, Shui Hau and Tai O. In some previous discussions with the Task Force on Lantau Conservation and the members of the Legislative Council, it was considered imminent to conduct a baseline study to capture the baseline ecological information on Lantau in pursuing the conservation initiatives.

To understand the current ecological status of Lantau, the Civil Engineering and Development Department (CEDD) commenced an “Ecological Study for Pui O, Shui Hau, Tai O and Neighbouring Areas – Feasibility Study” in December 2017 to gather baseline ecological information and explore feasible conservation measures for three Priority Sites namely Pui O, Shui Hau and Tai O. This study also covered desktop review to identify and prioritise ecologically important habitats other than these three Priority Sites for future reference when planning for ecological surveys and studies. The above study identified 16 areas in Lantau warranting detailed ecological surveys, which are grouped into three batches. It is suggested taking forward the first batch of areas covering San Tau to Sham Wat, Yi O and Shap Long.

In this connection, Mott MacDonald Hong Kong was appointed by CEDD to undertake the subject study, namely “Ecological Surveys and Studies for San Tau to Sham Wat, Yi O and Shap Long – Feasibility Study” (“the Study”).

The Study commenced on 7 September 2021 and aims to:

- (a) Review existing ecological information for the Study Areas of the Three Sites (which are San Tau to Sham Wat, Yi O and Shap Long) and devise the most appropriate methodology of ecological surveys for each of them;
- (b) Conduct a 12-month ecological survey for the Three Sites to evaluate and determine the ecological significance of the Study Areas and potential/existing ecological threats; and
- (c) Recommend conservation measures for the Three Sites.

The Study Areas of the Three Sites are shown in **Figure 1**.

## 1.2 Purpose of This Executive Summary

This Executive Summary is prepared to present a brief account on all the important findings of the assessment and recommendations undertaken in the Study.

## 2 Ecological Baseline for the Three Sites

### 2.1 Survey Sites

Desktop review, a set of 12-month ecological surveys and site inspections were conducted during the period from January 2022 to December 2022 to establish the ecological baseline information of the Three Sites, which cover the areas of San Tau to Sham Wat, Yi O and Shap Long.

To facilitate the presentation of ecological survey results, the San Tau to Sham Wat area was further separated into three sub-sites: San Tau, Hau Hok Wan to San Shek Wan and Sham Wat. These three sub-sites, along with Yi O and Shap Long, formed the five survey sites (**Figures 2.1**).

### 2.2 Sites of Conservation Importance

Several sites of conservation importance have been identified within and/or in close vicinity of the survey sites. These include Sites of Special Scientific Interest (SSSIs), Ecologically Important Stream (EIS), “Conservation Area” (“CA”), “Coastal Protection Area” (“CPA”), Fung Shui Woods, sites of conservation importance for butterfly, as well as mangrove stands. The indicative locations of the sites of conservation importance identified at the Three Sites are shown in **Figures 2.2**.

### 2.3 Habitats

A total of 15 habitats were identified at the Three Sites, most of them being typical to rural and coastal areas in Hong Kong. The estimated area of habitats of each survey site is summarised in **Table 2.1** and the habitat maps for each site are presented in **Figures 2.3a** to **2.3e**.

**Table 2.1: Estimated Area of Habitats identified at the Three Sites (in hectare)**

Habitat	San Tau	Hau Hok Wan to San Shek Wan	Sham Wat	Yi O	Shap Long
Abandoned Agricultural Land	7.01	19.72	1.21	2.01	1.74
Active Agricultural Land	0.85	4.52	2.78	2.21	-
Boulder Shore	-	2.47	-	-	-
Developed Area	0.02	0.77	0.89	-	3.56
Grassland	-	-	3.19	-	10.52
Mangrove	1.18	0.05	2.23	1.65	-
Marsh	-	-	0.34	0.55	0.10
Mudflat	19.34	6.56	14.36	22.61	-
Rocky Shore	0.06	1.50	1.00	0.37	0.66
Sandy Shore	0.12	1.49	-	-	0.87
Sandflat	-	-	-	-	0.70
Shrubland	11.34	24.05	77.64	4.23	11.85
Village	2.78	6.24	4.42	0.40	4.10
Watercourse	0.74	1.38	2.46	0.60	0.40
Woodland	19.15	81.46	57.34	13.22	37.33
<b>Total</b>	<b>62.6</b>	<b>150.19</b>	<b>167.86</b>	<b>47.84</b>	<b>71.82</b>

## 2.4 Flora and Fauna Species

### 2.4.1 San Tau

A total of 314 flora species, four mammal species, 80 avifauna species, 97 butterfly species, 22 odonate species, 20 herpetofauna species, 95 aquatic fauna species, 136 intertidal assemblage species (including two seagrass species and one horseshoe crab species) were recorded in San Tau during the 12-month ecological field survey.

#### *Species of Conservation Importance*

Among the species recorded and data derived from literature review, eight flora species, four mammal species, 21 avifauna species, 51 butterfly species, five odonate species (one of which was only recorded as nymph), nine herpetofauna species, 10 fish species, two crustacean species, three seagrass species and one horseshoe crab species are of conservation importance.

### 2.4.2 Hau Hok Wan to San Shek Wan

A total of 244 flora species, eight mammal species, 83 avifauna species, 100 butterfly species, 25 odonate species, 26 herpetofauna species, 78 aquatic fauna species and 153 intertidal assemblage species (including two horseshoe crab species) were recorded from Hau Hok Wan to San Shek Wan during the ecological field survey.

#### *Species of Conservation Importance*

Among the species recorded and data derived from literature review, 16 flora species, seven mammal species, 26 avifauna species, 42 butterfly species, six odonate species (two of which were recorded as nymph only), 13 herpetofauna species, six fish species, three crustacean species, and one horseshoe crab species are of conservation importance.

### 2.4.3 Sham Wat

A total of 386 flora species, 12 mammal species, 81 avifauna species, 81 butterfly species, 28 odonate species, 30 herpetofauna species, 105 aquatic fauna species, 111 intertidal assemblage species (including two horseshoe crab species), 75 mangrove community species and one seagrass species were recorded in Sham Wat during the ecological field survey.

#### *Species of Conservation Importance*

Among the species recorded and data derived from literature review, 15 flora species, 13 mammal species, 22 avifauna species, 41 butterfly species, six odonate species (one of which was only recorded as nymph), 16 herpetofauna species, seven fish species, two seagrass species and one horseshoe crab species are of conservation importance.

### 2.4.4 Yi O

A total of 224 flora species, eight mammal species, 99 avifauna species, 94 butterfly species, 34 odonate species, 22 herpetofauna species, 109 aquatic fauna species, 85 intertidal assemblage species (including two horseshoe crab species) and 54 mangrove community species were recorded in Yi O during the ecological field survey.

#### *Species of Conservation Importance*

Among the species recorded and data derived from literature review, four flora species, two mammal species, 42 avifauna species, 15 butterfly species, six odonate species, six herpetofauna



species, four fish species, two crustacean species and one horseshoe crab species are of conservation importance.

#### 2.4.5 Shap Long

A total of 317 flora species, eight mammal species, 92 avifauna species, 83 butterfly species, 30 odonate species, 26 herpetofauna species and 89 aquatic fauna species were recorded in Shap Long.

##### *Species of Conservation Importance*

Among the species recorded and data derived from literature review, 11 flora species, two mammal species, 26 avifauna species, 11 butterfly species, six odonate species, 12 herpetofauna species, four fish species and one crustacean species are of conservation importance.

The total number of species of conservation importance recorded at each survey site through literature review and in this Study are summarised in **Table 2.2** and **Table 2.3** respectively.

**Table 2.2 Number of Species of Conservation Importance Recorded at Each Survey Site from Literature Review**

Taxa Group	San Tau	Hau Hok Wan to San Shek Wan	Sham Wat	Yi O	Shap Long
Flora	3	9	3	1	1
Mammal	4	6	12	0	1
Avifauna	11	9	5	19	4
Butterfly	47	35	34	4	2
Odonate	3	3	5	0	1
Herpetofauna	7	10	10	3	6
Aquatic Fauna	11	4	4	2	3
Intertidal Assemblages	1	1	1	1	0
Mangrove Community	0	0	0	0	0
Seagrass	3	0	1	0	0
Horseshoe Crab	1	1	1	1	0

**Table 2.3: Number of Species of Conservation Importance Recorded at Each Survey Site in this Study**

Taxa Group	San Tau	Hau Hok Wan to San Shek Wan	Sham Wat	Yi O	Shap Long
Flora	7	9	13	4	10
Mammal	1	2	3	2	2
Avifauna	17	23	22	34	26
Butterfly	19	16	12	12	9
Odonate	3	3	1	6	6
Herpetofauna	4	9	10	6	10

Aquatic Fauna	5	6	4	6	2
Intertidal Assemblages	1	SSW: 0 SLW: 1 HHW: 0	1	1	-
Mangrove Community	-	-	1	0	-
Seagrass	2	-	1	-	-
Horseshoe Crab	1	1	1	1	-

## 3 Key Ecological Resources of the Three Sites

Based on the ecological baseline data for the Three Sites, characteristics of the species and habitats that deserve attention were identified, i.e. habitats of significant ecological value which are rated as moderate to high or high in the overall ecological value as well as habitats with overall moderate ecological value but with high significance to flora or particular fauna groups. This section highlights the key ecological resources with conservation importance identified.

### 3.1 San Tau

San Tau, located in the north-eastern foothills of Nei Lak Shan, encompasses diverse habitats including streams, dense woodlands, agricultural land, and intertidal soft shores. The mature woodlands along the San Tau Stream provide continuous and undisturbed habitats for wildlife, supporting a high diversity and abundance of fauna. Notably, the intertidal mudflat, watercourse (San Tau stream) and a complex of lowland terrestrial habitats are identified as habitats of significant ecological value.

The intertidal mudflat, characterised by a mix of hard and soft substrates, contributes to the diverse intertidal fauna due to its extensive coverage and heterogeneity. Part of the intertidal mudflat falls within San Tau Beach SSSI in recognition of the seagrass beds, which hosts two rare seagrass species, Oval Halophila and Dwarf Eel Grass. Seagrass beds serve as shelter and food source for intertidal fauna, and act as nursery grounds for horseshoe crabs. The intertidal mudflat plays a crucial role in facilitating the movement of intertidal faunal communities among mangroves, as well as the migration of diadromous fishes among coastal water, estuary, and freshwater stream. Moreover, the intertidal mudflat also serves as a feeding ground for ardeids including Great Egret and Little Egret.

The watercourse, i.e. San Tau stream, consists of partially channelised catchwater downstream and natural habitat upstream, providing a semi-natural habitat for aquatic fauna with conservation importance. This stream is ecologically connected to surrounding terrestrial habitats, including abandoned agricultural land, shrubland, and woodland, which support a variety of fauna species. Species of conservation importance, Brown Fish Owl and Romer's Tree Frog, were found associated with the lowland stream and riparian habitats.

The lowland terrestrial habitats comprise abandoned agricultural land, shrubland and woodland. These habitats harbour diverse vegetation types with an array of nectar and host plants for butterfly, exhibiting high habitat complexity and heterogeneity, resulting in a high diversity of butterflies and herpetofauna. Butterfly species of conservation importance, White Dragontail, and herpetofauna species of conservation importance, Tokay Gecko and Romer's Tree Frog, were regularly recorded in these lowland terrestrial habitats.

Considering factors such as the presence of seagrass beds, the intact ecological connectivity of the lowland stream, and the high butterfly diversity, the overall ecological value of San Tau is evaluated as **High**.

### 3.2 Hau Hok Wan to San Shek Wan

Hau Hok Wan to San Shek Wan, located on the northwest side of Nei Lak Shan, encompasses a range of habitats undergoing ecological succession to become a maturing woodland. Among the identified habitats, mudflat, shrubland and woodland are identified as having significant ecological value.

The intertidal mudflat along the northern shore of Sha Lo Wan serves as a nursery ground for two horseshoe crab species, i.e. Mangrove Horseshoe Crab and the endangered Chinese Horseshoe Crab. As most of the individuals recorded were in juvenile stage, the predominance of juvenile individuals indicates importance of this habitat for their early development.

The shrubland along the Tung O Trail supports a diverse and abundant wildlife community. Notably, it hosts a relatively high diversity and abundance of butterflies, including those of conservation importance, and their corresponding larval host plants. For example, butterfly species of conservation importance, Falcate Oak Blue, was found flying around its larval host plant Creepy Mallotus, while the relatively high abundance of Common Archduke is supported by its larval host plant Yellow Cow Wood and rotting figs of *Ficus* spp. This recognition as a butterfly hotspot is a key attribute to its significant ecological value.

The survey site also contains a large woodland patch in the western part, with smaller patches in the north-eastern area, enclosed by hillside shrublands along the Tung O Trail. The woodland, comprising remnants of tree plantations and a Fung Shui Wood behind the village, supports flora species of conservation importance *Gmelina chinensis* and rare bird species Malayan Night Heron, and contributes to the identified butterfly hotspot in the area. It is also ecologically connected to adjacent habitats, including abandoned agricultural land, shrubland, and watercourse.

Considering these factors, the overall ecological value of Hau Hok Wan to San Shek Wan is evaluated as **Moderate**.

### 3.3 Sham Wat

Sham Wat encompasses the river valley alongside the Sham Wat Stream, extending from Ngong Ping to Sham Wat. It also includes the hillside slopes near San Chau and the Sham Shek Tsuen village area to the east. Among the various habitats identified, mudflat, shrubland, woodland, watercourse (Sham Wat EIS) and mangrove are considered ecologically significant.

The intertidal mudflat in Sham Wat is an uncommon and undisturbed natural feature, characterised by a sheltered shore with minimal wave action. The sediment stratification contributes to the high intertidal fauna species diversity. This intertidal mudflat stands out for its distribution of a rare seagrass species, Oval Halophila, and serves as breeding and nursery ground for two horseshoe crabs species. It is also ecologically linked to the mangrove and the Sham Wat EIS, facilitating movement of migratory fish between coastal and freshwater environment. However, this intertidal mudflat is currently threatened by exotic mangrove species, *Sonneratia*.

The shrubland in Sham Wat is in patchy locations across the survey site, including the foothills of Cheung Shan and Nei Lak Shan along the Tung O Trail, as well as adjacent to the Sham Wat Stream in the Sham Wat valley. The latter is ecologically linked to the surrounding woodlands and Sham Wat EIS, creating a mosaic of habitats within the river valley, which nurtures high ecological linkages. Together with the woodlands in the river valley, it serves as a potential breeding ground for various terrestrial fauna and supports a variety of flora diversity and fauna diversity, including rare bird species Eurasian Eagle-Owl, and flora species of conservation importance such as *Gmelina chinensis* and two orchid species, Dense-flowered Geodorum and Toothed Habenaria. Away from the river, the hillslope of San Chau SSSI harbours the largest colony of rare plant species Champion's Rhododendron, and thus it is designated as a SSSI in Hong Kong.

The woodland in Sham Wat is scattered across the survey site and represents a large natural habitat. It is ecologically linked to the Sham Wat EIS and surrounding shrublands, forming a mosaic of habitats within the river valley. It supports a high diversity of flora and fauna, including rare migrant bird, Fairy Pitta, mammal species of conservation importance, Red Muntjac and Small-toothed Ferret Badger, as well as flora species of conservation importance. The woodland

also serves as an important habitat for seed dispersal agents which contribute to vegetation succession.

The watercourse, i.e. Sham Wat EIS, is a natural and undisturbed stream habitat that runs from the hillside down to the lowland and is well connected to the estuarine habitats in Sham Wat Wan. It is considered an uncommon habitat in Hong Kong due to its high integrity. The watercourse supports various aquatic fish and macroinvertebrate species of conservation importance. It is also ecologically connected to the intertidal mudflat through the estuary, allowing the passage of migratory fishes, and serving as a potential nursery ground for estuarine fishes. These indicate the naturalness and habitat continuity from the estuary to the upstream.

The mangrove habitat in Sham Wat is significant for mangrove community species. It is ecologically linked to the intertidal mudflat and the Chinese Horseshoe Crab was recorded.

Considering these factors, the overall ecological value of Sham Wat is evaluated as **High**.

### 3.4 Yi O

Yi O is located at the western end of Lantau, embraced by Tai Hom Sham and Nga Ying Shan to the east and Kai Kung Shan to the west. The primary landscape and ecological features include a lowland stream flowing from south to north and a sheltered bay. The habitats identified as having significant ecological value are the watercourse, mudflat, active agricultural land and woodland.

The intertidal mudflat in Yi O is a natural habitat situated with muddy substrate. It receives freshwater from the lowland river and hill streams, making it an uncommon habitat in Hong Kong. The intertidal mudflat supports native mangrove stands and a variety of intertidal communities. It serves as a nursery ground for two species of horseshoe crabs, with the Chinese Horseshoe Crab showing the highest abundance among all survey sites. The presence of a large aggregation of Soldier Crabs, which feed on the sand surface near the shoreline, is also remarkable. The mudflat is ecologically linked to mangrove, rocky shore, watercourse, and coastal habitats, allowing the movement of aquatic fauna such as horseshoe crabs and fishes. It also supports terrestrial flora and fauna, including a rare butterfly species, Banded Awl, and its larval host plant, Wild Bean.

Yi O is home to several watercourses, including tributaries and estuaries of Shui Lo Cho Stream and Nga Ying West Stream. Some watercourses flow through natural and undisturbed lowland areas, the lowland habitat complex is uncommon in Hong Kong. The presence of these watercourses contributes to the rich biodiversity of Yi O. They support high aquatic fauna diversity, including primary freshwater fish and estuarine fish. The watercourse is also ecologically linked to riparian vegetation, terrestrial habitats, estuary, and intertidal mudflat.

The active agricultural land in Yi O is recently re-established for cultivation of crops and orchard species, and rice in paddy fields. Although slightly fragmented, this habitat supports a variety of flora and fauna species. During the autumn harvest, the paddy fields attract a community of seed-eating birds, including a critically endangered species, Yellow-breasted Bunting, which relies on the food sources from the fields to continue their migration.

Woodlands are scattered throughout Yi O which contribute to the diversity of avifauna, butterfly and herpetofauna in the site.

Considering the various habitats present in Yi O, the overall ecological value of Yi O is evaluated as **Moderate to High**.

### 3.5 Shap Long

Shap Long comprises two major areas, i.e. the lowland valley at the western part near Shap Long village, and the narrow river valley downstream of Shap Long Irrigation Reservoir and Cheung Sha Wan village at the eastern part. Both areas are surrounded by plantation woodlands abutting

Lantau South Country Park. Among the identified habitats, watercourse (lowland stream and estuary), woodland and grassland are of significant ecological value.

The watercourse in Shap Long includes a lowland stream running across Shap Long Kau Tsuen and a stream section below Shap Long Irrigation Reservoir. These watercourses are relatively natural and unobstructed, which is uncommon in Hong Kong. The downstream section of the lowland stream is particularly important, serving as a nursery ground for various estuarine and marine fish species such as Mangrove Snapper, Blackhead Seabream and Yellowfin Seabream. The presence of migratory fish species, Dark-margined Flagtail, indicates the significance of the estuary as a vital habitat. The lowland stream supports the rare bird species, Brown Fish Owl, and a herpetofauna species of conservation importance, Short-legged Toad. The latter was found in a woodland stream.

The woodlands in Shap Long are distributed across the survey site. It is a semi-natural, with some areas developed from plantations in the past. The woodland exhibits high flora and fauna diversity, including several rare migratory bird species such as Fairy Pitta and Malayan Night Heron. Notably, the woodland near the Shap Long Irrigation Reservoir serves as a winter roosting site for ardeids, with significant numbers of Black-crowned Night Herons recorded.

The grassland in Shap Long is a semi-natural habitat primarily located in the north-western of the survey site near Shap Long San Tsuen, with a smaller area near the downstream of Shap Long Irrigation Reservoir. Derived from abandoned agricultural land, the grassland near Shap Long San Tsuen is maintained by Domestic Water Buffalos. It is ecologically linked to the adjacent woodland and supports high species richness and breeding of aquatic insects and amphibians.

Considering these factors, the overall ecological value of Shap Long is evaluated as **Moderate**.

## 4 Key Ecological Threats and Review of Existing Conservation Measures

### 4.1 Key Ecological Threats / Disturbances

The Three Sites face various ecological threats from habitat loss to disturbance to wildlife, which were identified during the 12-month ecological field surveys. Some of these threats significantly impact habitats with significant ecological value and species of conservation importance. A summary of the key threats and disturbances identified at each survey site is provided in **Table 4.1**.

**Table 4.1: The Key Threats / Disturbances identified at Each Survey Site**

Key Threats / Disturbances	San Tau	Hau Hok Wan to San Shek Wan	Sham Wat	Yi O	Shap Long
Invasion of exotic species (Sonneratia)			✓	✓	
Invasion of exotic species (Mikania)	✓				
Marine refuse				✓	
Ghost net	✓	✓	✓	✓	
Vegetation removal	✓	✓			
Damages to flora species of conservation importance	✓	✓	✓	✓	✓
Land-clearing					✓
Land-filling / fly-tipping					✓

### 4.2 Existing Conservation Measures

In this Study, existing statutory and administrative measures were reviewed, including legislations, ordinances, guidelines, and long-term ecological surveillances, that directly and indirectly contribute to the conservation of the natural resources of the Three Sites. However, certain limitations were identified when applying these measures to the Three Sites. For instance, anthropogenic disturbances were observed on private land, where existing statutory measures may not adequately protect the affected habitats and their ecological value. Other limitations include protection being limited to areas zoned under specific categories in the Town Planning Ordinance (TPO), i.e. “CA”, “SSSI”, “GB” and “CPA” etc., and species of conservation importance identified outside the boundaries of these specific categories lacking essential protection.

To enhance the preservation and restoration of ecological resources of the Three Sites, site-specific measures and proactive measures have been proposed. These measures are detailed in **Section 5**.

## 5 Sensitive Areas at the Three Sites and Recommended Conservation Measures

Sensitive areas were identified based on the findings gathered from ecological survey results. These include habitats of significant ecological value; those require further ecological monitoring or research; those could be enhanced to higher ecological value through suitable protection or conservation measures; and those are under threat but could be restored through proper control measures.

The conservation measures proposed in this section aim to enhance the ecological values of the sensitive areas or mitigate the threats that pose risks to species of conservation importance. **Figure 5.1a** to **5.1e** present the recommended conservation measures for each survey site as well as the conservation initiatives across the survey sites.

### 5.1 San Tau

In San Tau, three sensitive areas were identified, including the intertidal mudflat, the butterfly hotspot, the lowland stream and adjoining habitats. The recommended conservation measures for this survey site are shown in **Figure 5.1a**.

#### 5.1.1 Intertidal Mudflat

The intertidal mudflat in San Tau has **High** ecological value but faces a **Moderate** threat significance posed by the ghost net.

The ghost nets found on the intertidal mudflat are considered a threat to the wildlife in San Tau as they may entangle the intertidal fauna and flora, especially seagrass bed and horseshoe crab, and lead to habitat degradation.

Habitat-specific conservation objectives are recommended for the intertidal mudflat across the northern to western coasts of Lantau. They aim for reducing the impact of ghost net on wildlife and understanding the ecological significance of the intertidal mudflat.

Removal of ghost nets and marine refuse through contractors and/or public education and engagement programs facilitated by NGOs is recommended. To obtain a better understanding of the population density and distribution of horseshoe crab and seagrass within Lantau and investigate the ecological significance of intertidal mudflat to the two groups, in-depth research on their ecology is recommended, which would help to formulate an appropriate conservation strategy. These recommended conservation measures are collectively regarded as “Intertidal Mudflat Conservation Initiatives”.

#### 5.1.2 Butterfly Hotspot

The butterfly hotspot in San Tau comprises abandoned agricultural land, village, shrubland and woodland habitats, which are all evaluated as habitats of overall **Moderate** ecological value. However, the presence of exotic plant, Mikania, and vegetation removal pose a **Moderate** threat to the butterflies, and their corresponding host and nectar plants.

Specific conservation objectives are to reduce the impact of invasive species on native and rare plant species, enhance the ecological value of butterfly hotspot and monitor the butterfly diversity and their habitats in the long term. Conservation measures recommended include enhancement planting of butterfly host and nectar plants and subsequent monitoring for the effectiveness,



removal of the invasive Mikania and long-term ecological monitoring programs for the butterfly hotspot.

### 5.1.3 Lowland Stream and Adjoining Habitats

In San Tau Stream of **Moderate to High** ecological value, and its riparian habitats, rare species of various fauna groups were found.

Despite the absence of key threats or disturbances, a long-term ecological monitoring is recommended to assess the species diversity of the lowland stream and adjoining habitats. The monitoring is conducive to understanding the biodiversity of the lowland stream, given that some aquatic species are migratory in nature which need longer term monitoring to trace their occurrence pattern.

## 5.2 Hau Hok Wan to San Shek Wan

From Hau Hok Wan to San Shek Wan, two sensitive areas were identified, including the intertidal mudflat (Sha Lo Wan) and the butterfly hotspot. The recommended conservation measures for this survey site are shown in **Figure 5.1b**.

### 5.2.1 Intertidal Mudflat (Sha Lo Wan)

The Sha Lo Wan intertidal mudflat is evaluated as a habitat of **Moderate** ecological value. However, it is under a **Moderate** threat posed by the ghost nets left on the shore. Ghost nets were found on the intertidal mudflat which may cause entanglement of wildlife, especially horseshoe crabs.

The Intertidal Mudflat Conservation Initiatives, mentioned in **Section 5.1.1**, are recommended to reduce the impact of ghost net on wildlife and understand the ecological significance of the intertidal mudflat to horseshoe crabs.

### 5.2.2 Butterfly Hotspot

The woodland and shrubland near Sha Lo Wan with overall ecological value of **Moderate** and **Moderate to High** respectively, are identified as butterfly hotspot due to their relatively high butterfly diversity. However, vegetation removal poses **Moderate** threats to this hotspot.

To restore the ecological value of the butterfly hotspot, ecological enhancement measures are deemed necessary. The recommended conservation measures, similar to those for San Tau, include planting more butterfly host and nectar plants to remediate and enhance the habitat quality, along with the implementation of a butterfly monitoring program to evaluate the effectiveness.

## 5.3 Sham Wat

In Sham Wat, two sensitive areas were identified, i.e. intertidal mudflat and river valley. The recommended conservation measures for this survey sites are shown in **Figure 5.1c**.

Sham Wat EIS and riparian area (woodland) are recognised as natural habitats with **High** and **Moderate to High** ecological value respectively. Since there are no key threats or disturbances identified in these habitats, and both areas are currently zoned as “CA” which offers protection, no specific conservation measures are therefore considered necessary.

### 5.3.1 Intertidal Mudflat

The intertidal mudflat in Sham Wat has **High** ecological value that supports diverse wildlife, including seagrass and horseshoe crab. However, it faces **Moderate** threats from ghost net and the invasive mangrove Sonneratia.

To restore the naturalness and ecological value of the coastal habitats, removal of *Sonneratia* through public education and engagement programme is recommended. Other than the Intertidal Mudflat Conservation Initiatives as mentioned in **Section 5.1.1**, an ecological feasibility study on protection of intertidal mudflat is also recommended to gather more extensive ecological information and explore feasible conservation mechanisms such as designation of conservation zones.

### 5.3.2 River Valley

The river valley adjoining Sham Wat EIS, comprising woodland and shrubland habitat, has **Moderate to High** ecological value that supports diverse flora and fauna species. Key threats identified include damage to flora species of conservation importance, which pose **Moderate** threats to these habitats.

Given the rich flora and fauna recorded and ongoing ecological succession toward more mature habitats, the river valley may develop higher ecological value in the future and deserve a higher conservation status. To this end, the objective of conservation measures recommended for Sham Wat river valley is to conduct more habitat- or species-specific ecological survey in the area, aiming to support further protection measures and/or enhanced conservation zonings in the future. Therefore, further studies such as a feasibility study on protection of the river valley and monitoring by local institutions and/or consultants are recommended.

## 5.4 Yi O

In Yi O, three sensitive areas were identified, including the intertidal mudflat, the paddy fields and adjoining habitats, and the lowland river. The recommended conservation measures for this survey site are shown in **Figure 5.1d**.

### 5.4.1 Intertidal Mudflat

The intertidal mudflat in Yi O exhibits **High** ecological value, hosting various intertidal communities and serving as a nursery ground for horseshoe crab. Key threats and disturbances of **Moderate** extent include *Sonneratia* invasion, accumulation of marine refuse and ghost nets.

To enhance the naturalness and ecological value of the coastal habitat, removal of *Sonneratia* is recommended. In addition, the Intertidal Mudflat Conservation Initiatives mentioned in **Section 5.1.1** are also applicable.

### 5.4.2 Paddy Fields and Adjoining Habitats

The reintroduction of farming in Yi O has enriched habitats and increased species diversity, including migratory bird species. The ecological value of the paddy fields is **Moderate to High**, and no key threats or disturbances were identified in this habitat.

As the paddy fields and adjoining habitats have been found attractive to wildlife, particularly to avifauna species of conservation importance, it is expected that if the ecologically friendly agricultural activities can be maintained or even expanded, wetland biodiversity can be further boosted. Therefore, the expansion of paddy fields accompanied by a wildlife monitoring program are recommended as conservation measures.

### 5.4.3 Lowland River

The lowland river in Yi O is a key ecological feature with **High** ecological value. It supports diverse aquatic fauna, including rare freshwater fish species and migratory aquatic fauna. No key threats or disturbances were identified in this habitat.

Due to its high ecological value, the specific conservation objective is to monitor species of conservation importance and ecological value of the habitat. An in-depth study is recommended to better understand the ecological significance of the lowland river.

## 5.5 Shap Long

In Shap Long, three sensitive areas were identified, including the lowland stream and estuary, the shrublands and woodlands edging Shap Long Irrigation Reservoir (which refers to an ardeid's roost), and the grassland. The recommended conservation measures for this survey site are shown in **Figure 5.1e**.

### 5.5.1 Lowland Stream and Estuary

The lowland stream in Shap Long is a significant ecological feature with a relatively high diversity of estuarine fish species in its lower section. The ecological value of this habitat is considered **Moderate to High**.

No key threats or disturbances were recorded in this habitat. However, the high diversity of fish species in the estuary deserves conservation attention. Therefore, specific conservation objective is to monitor fish species in the lowland stream and estuary in long term. An in-depth ecological research and monitoring study for the lowland stream and estuary is recommended to elucidate their ecological significance.

### 5.5.2 Shrublands and Woodlands edging Shap Long Irrigation Reservoir (Ardeid's Roost)

A considerable number of ardeids was found roosting in the shrubland and woodland in the Shap Long Irrigation Reservoir during mid-winter on one occasion. This occurrence may imply that the site is potentially importance for the migratory ardeids.

No key threats or disturbances were recorded. Given that the ardeid roost was only newly established, further monitoring is recommended to elucidate its ecological significance.

### 5.5.3 Grassland

The grassland in Shap Long has a **Moderate** ecological value as it is originated from abandoned agricultural land and is maintained by Domestic Water Buffalos. The seasonal wet buffalo wallows benefit wetland-dependent species, primarily amphibians and some bird species. Although the diversity and abundance of wetland-dependent birds were not high during the survey period, the unique habitat deserves conservation attention.

The key threats, including suspected vegetation removal, land clearing, land filling or fly-tipping activities, pose **Moderate** threat significance to the grassland. Specific conservation objectives are to monitor species diversity and track changes in habitat quality in the face of these threats. Thus, ecological monitoring for the grassland is recommended.

## 5.6 Population of Incense Tree

Incense Tree is a flora species of conservation importance in Hong Kong, which is threatened by illegal poaching for its agarwood. This species was found across the survey sites with damaged individuals recorded. Given its conservation status, the threat is considered of **Moderate** significance to Incense Tree as well as to the concerned shrubland and woodland habitats and other associated species.

To conserve Incense Tree, Incense Tree Conservation Initiatives, which include public education and planting of Incense Trees, are recommended.

An Incense Tree Species Action Plan has been formulated by the Agriculture, Fisheries and Conservation Department (AFCD) to protect and restore the Incense Tree population in Hong Kong, and to support NGOs in conducting education programs or campaigns on Incense Trees. It is noted that AFCD will continue to carry out an annual tree planting program for the Incense Tree in country parks on Lantau. AFCD's relentless effort is considered efficient in replenishing the Incense Tree population on Lantau. However, it is still suggested to explore other suitable planting locations in the future should planting outside country parks be considered conducive to local ecology.

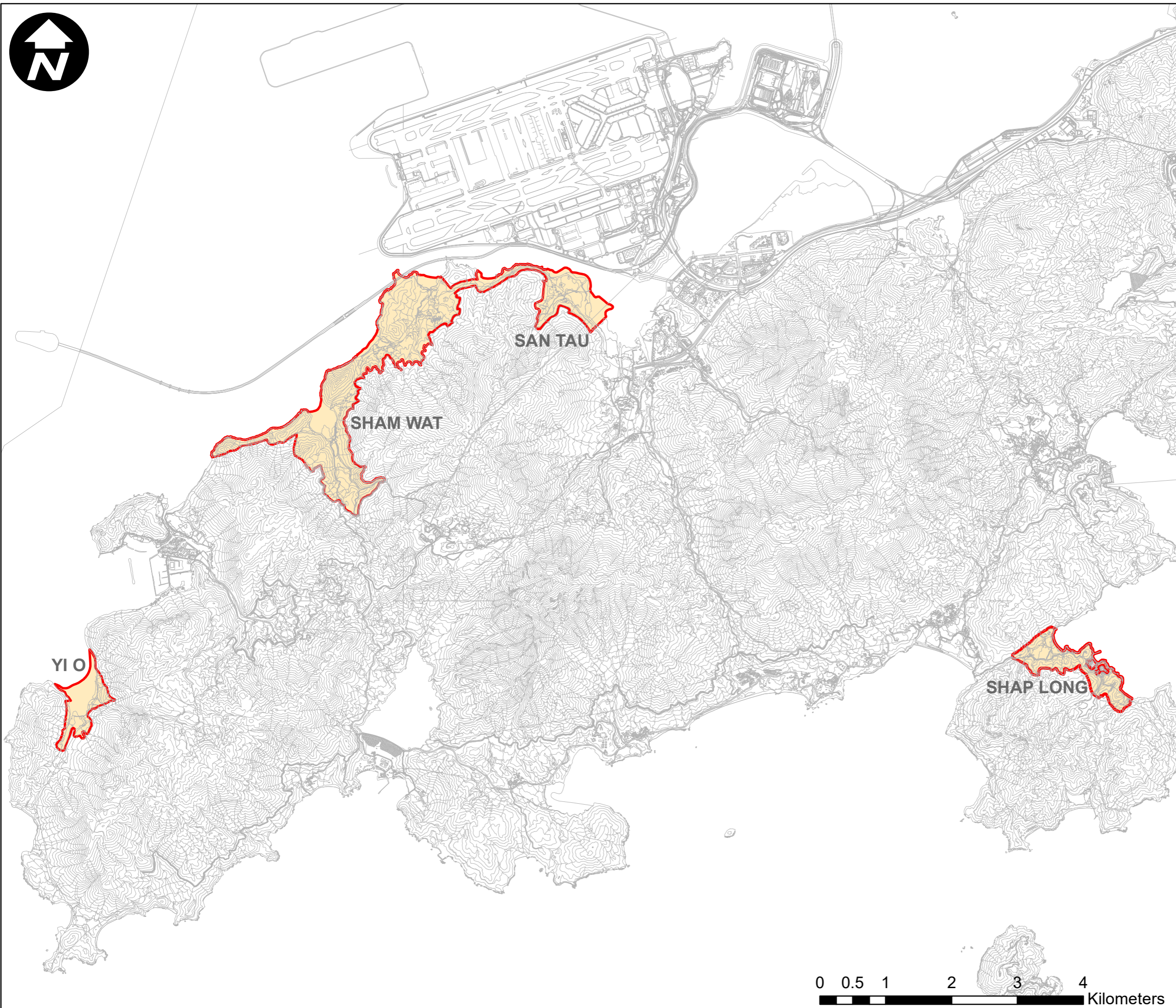
The sensitive areas identified at each site and recommended conservation measures are summarised in **Table 5.1**.

**Table 5.1: Sensitive Areas of Each Site and the Recommended Conservation Measures**

Survey Site(s)	Sensitive Areas	Recommended Conservation Measures
San Tau	Intertidal Mudflat	<ul style="list-style-type: none"> <li>Intertidal Mudflat Conservation Initiatives                             <ol style="list-style-type: none"> <li>Removal of ghost net</li> <li>Ecological research and monitoring program for horseshoe crabs and seagrass beds</li> </ol> </li> </ul>
	Butterfly Hotspot	<ul style="list-style-type: none"> <li>Planting butterfly host and nectar plants and subsequent monitoring</li> <li>Removal of invasive species (Mikania)</li> <li>Ecological monitoring program for the butterfly hotspot</li> </ul>
	Lowland Stream and Adjoining Habitats	<ul style="list-style-type: none"> <li>Ecological monitoring program for the lowland stream and adjoining habitats</li> </ul>
Hau Hok Wan to San Shek Wan	Intertidal Mudflat (Sha Lo Wan)	<ul style="list-style-type: none"> <li>Intertidal Mudflat Conservation Initiatives                             <ol style="list-style-type: none"> <li>Removal of ghost net</li> <li>Ecological research and monitoring program for horseshoe crabs</li> </ol> </li> </ul>
	Butterfly Hotspot	<ul style="list-style-type: none"> <li>Planting butterfly host and nectar plants and subsequent monitoring</li> </ul>
Sham Wat	Intertidal Mudflat	<ul style="list-style-type: none"> <li>Removal of exotic species (Sonneratia)</li> <li>Intertidal Mudflat Conservation Initiatives                             <ol style="list-style-type: none"> <li>Removal of ghost net</li> <li>Ecological research and monitoring program for horseshoe crabs and seagrass beds</li> </ol> </li> <li>Feasibility study on protection of intertidal mudflat</li> </ul>
	River Valley	<ul style="list-style-type: none"> <li>Feasibility study on protection of the Sham Wat River Valley</li> </ul>
Yi O	Intertidal Mudflat	<ul style="list-style-type: none"> <li>Removal of exotic species (Sonneratia)</li> <li>Intertidal Mudflat Conservation Initiatives                             <ol style="list-style-type: none"> <li>Removal of marine refuse and ghost net</li> <li>Ecological research and monitoring program for horseshoe crabs</li> </ol> </li> </ul>
	Paddy Fields and Adjoining Habitats	<ul style="list-style-type: none"> <li>Paddy field expansion</li> <li>Ecological monitoring program for the active farmlands</li> </ul>
	Lowland River	<ul style="list-style-type: none"> <li>Ecological research and monitoring program for the lowland river in Yi O</li> </ul>

Survey Site(s)	Sensitive Areas	Recommended Conservation Measures
Shap Long	Lowland River	<ul style="list-style-type: none"> <li>• Ecological research and monitoring program for lowland stream and estuary</li> </ul>
	Shrublands and Woodlands edging Shap Long Irrigation Reservoir (Ardeid's Roost)	<ul style="list-style-type: none"> <li>• Ecological monitoring program for the ardeid's roost</li> </ul>
	Grassland	<ul style="list-style-type: none"> <li>• Ecological monitoring program for the grassland</li> </ul>
Various	Population of Incense Tree	<ul style="list-style-type: none"> <li>• Incense Tree Conservation Initiatives                             <ol style="list-style-type: none"> <li>i. Ecological education program about conservation issue of Incense Tree</li> <li>ii. Exploring suitable locations for planting Incense Tree outside country parks</li> </ol> </li> </ul>

# Figures



Key Plan: 1 : 800,000



Notes:

Key to symbols:

**LEGEND**  
 STUDY AREA

Rev	Date	Drawn	Description	Ch'k'd	App'd
P1	JUL 2022	KN		YL	GC

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**土木工程拓展署**  
**Civil Engineering and Development Department**

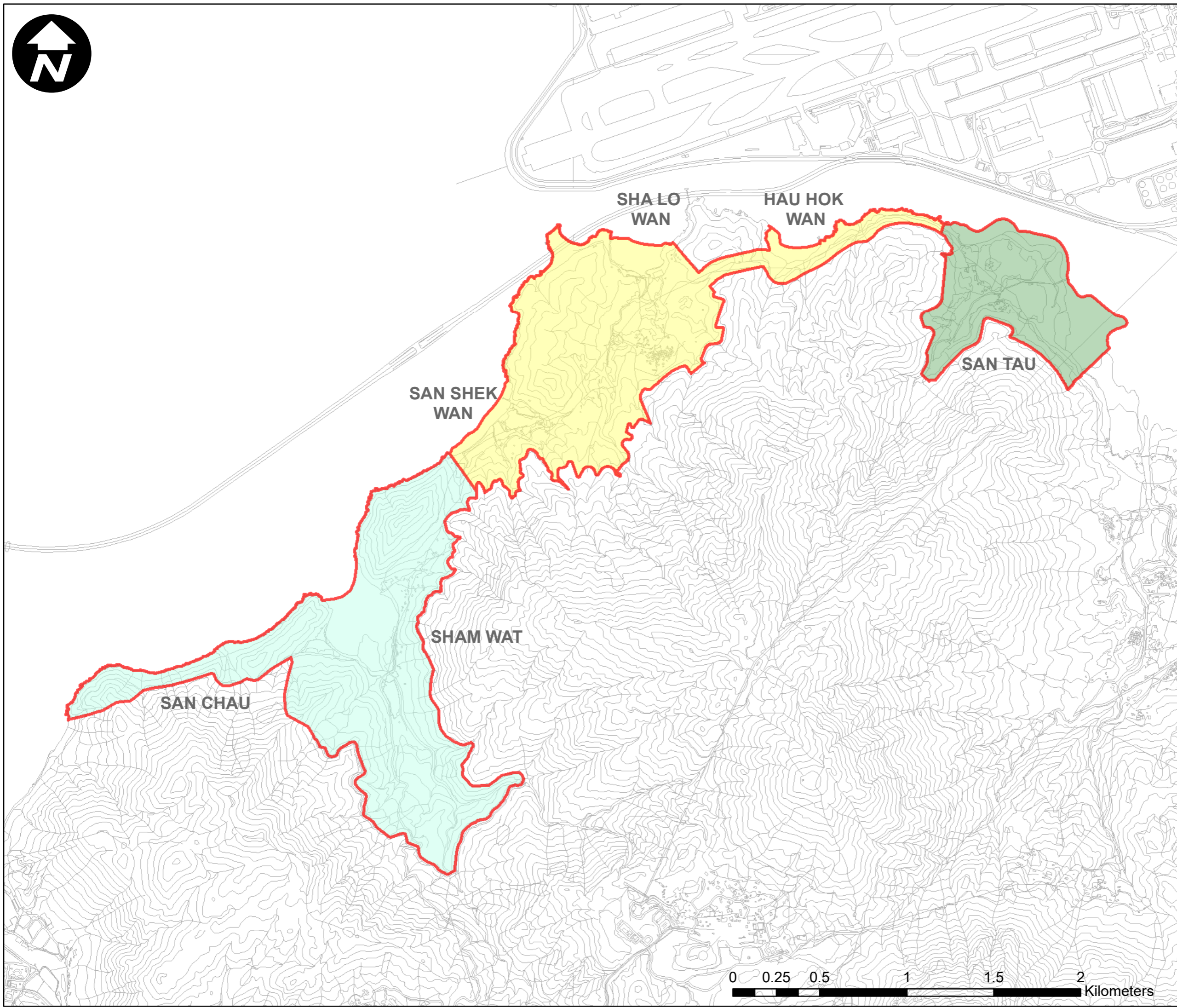
Project  
**AGREEMENT NO. CE 61/2020 (SP)**  
**ECOLOGICAL SURVEYS AND STUDIES FOR**  
**SAN TAU TO SHAM WAT, YIO AND SHAP LONG**  
**- FEASIBILITY STUDY**

Title  
**STUDY AREA OF THE THREE SITES**

Designed		Eng check	
Drawn		Coordination	
Dwg check		Approved	
Scale at A3	Status	Rev	
<b>AS SHOWN</b>	<b>FINAL</b>		<b>P1</b>

Drawing Number **FIGURE 1**





Key Plan: 1 : 800,000



Notes:

Key to symbols:

**LEGEND**

- SAN TAU
- HAU HOK WAN TO SAN SHEK WAN
- SHAM WAT

P1	JUL 2023	JUT		YL	GC
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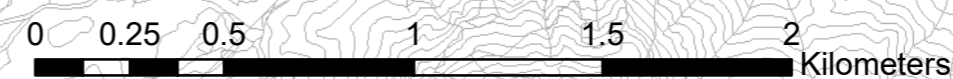
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**SAN TAU TO SHAM WAT, YI O AND SHAP LONG**  
**- FEASIBILITY STUDY**

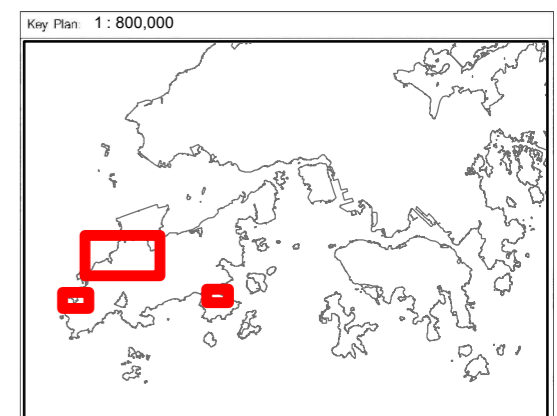
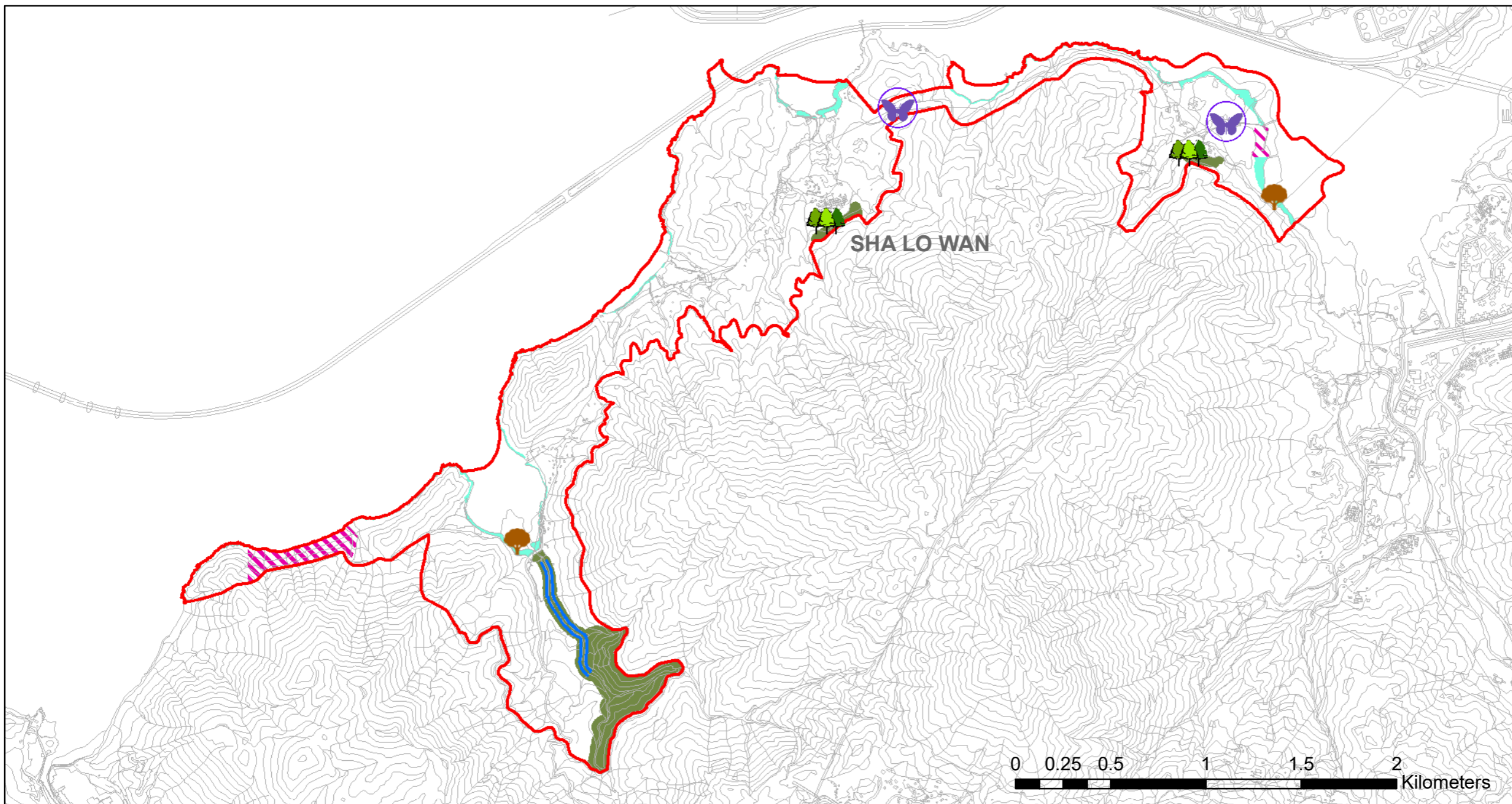
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**TO THREE SURVEY SITES**

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Drawn	JUT	Coordination	YL	
Dwg check	N.A.	Approved	GC	
Scale at A3	AS SHOWN	Status	FINAL	Rev
				P1

Drawing Number  
**FIGURE 2.1**





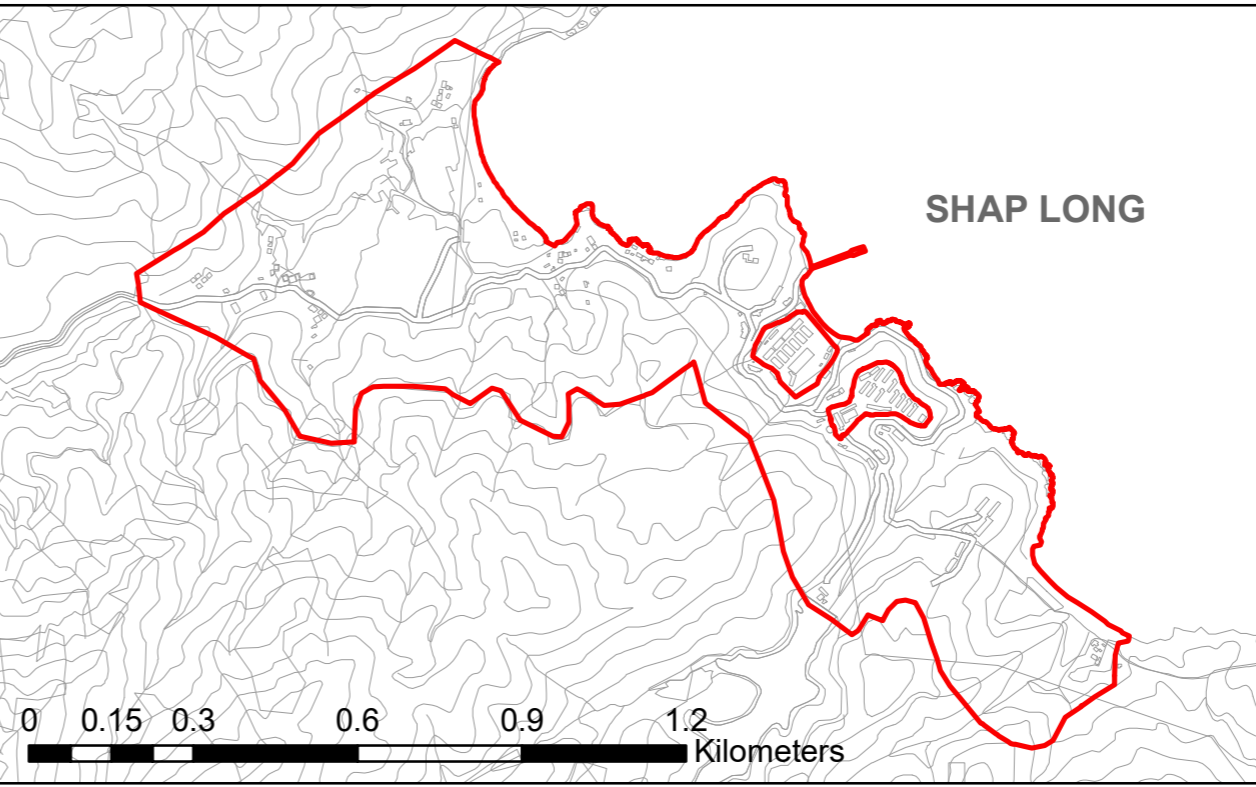
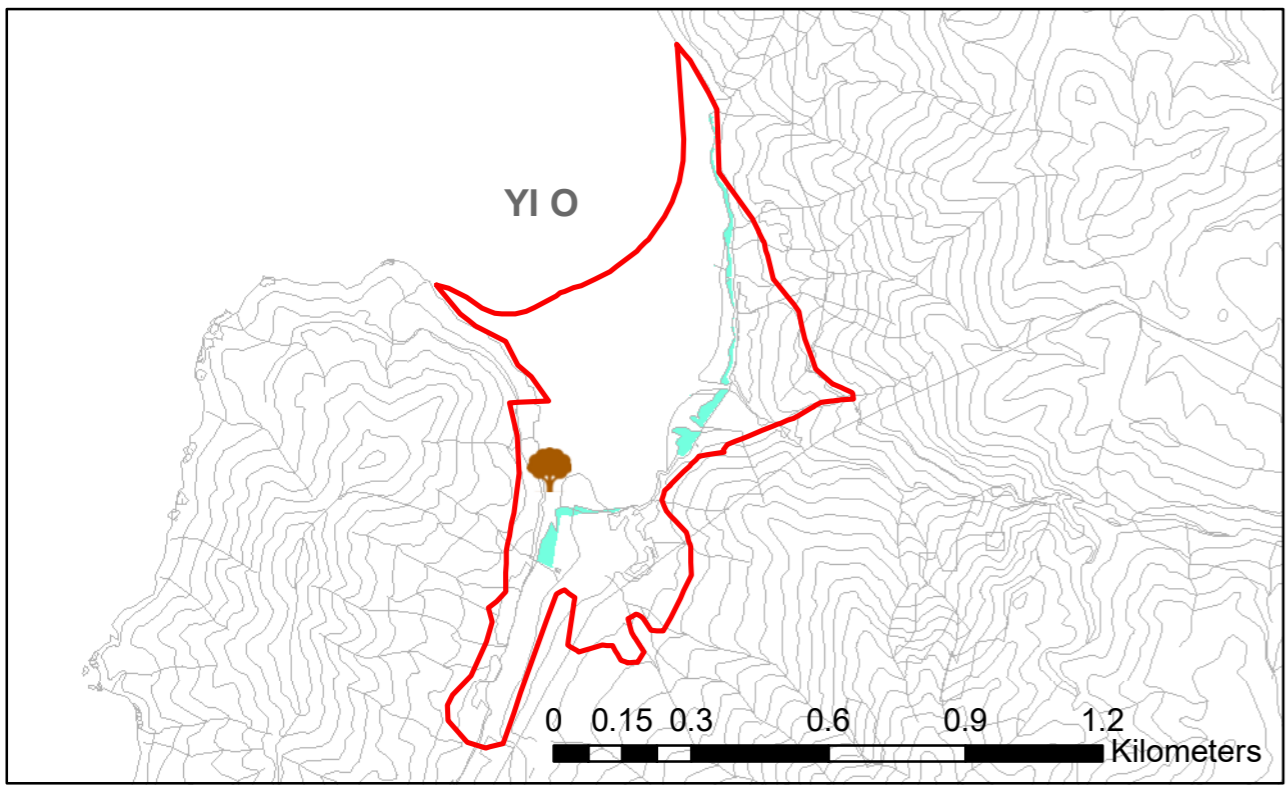


Notes:

Key to symbols:

- LEGEND**
- STUDY AREA
  - SITE OF SPECIAL SCIENTIFIC INTEREST (SSSI)
  - CONSERVATION AREA (CA)
  - COASTAL PROTECTION AREA (CPA)
  - ECOLOGICALLY IMPORTANT STREAM (EIS)
  - BUTTERFLY HOTSPOT
  - MANGROVE STAND
  - FUNG SHUI WOOD

Rev	Date	Drawn	Description	Ch'k'd	App'd
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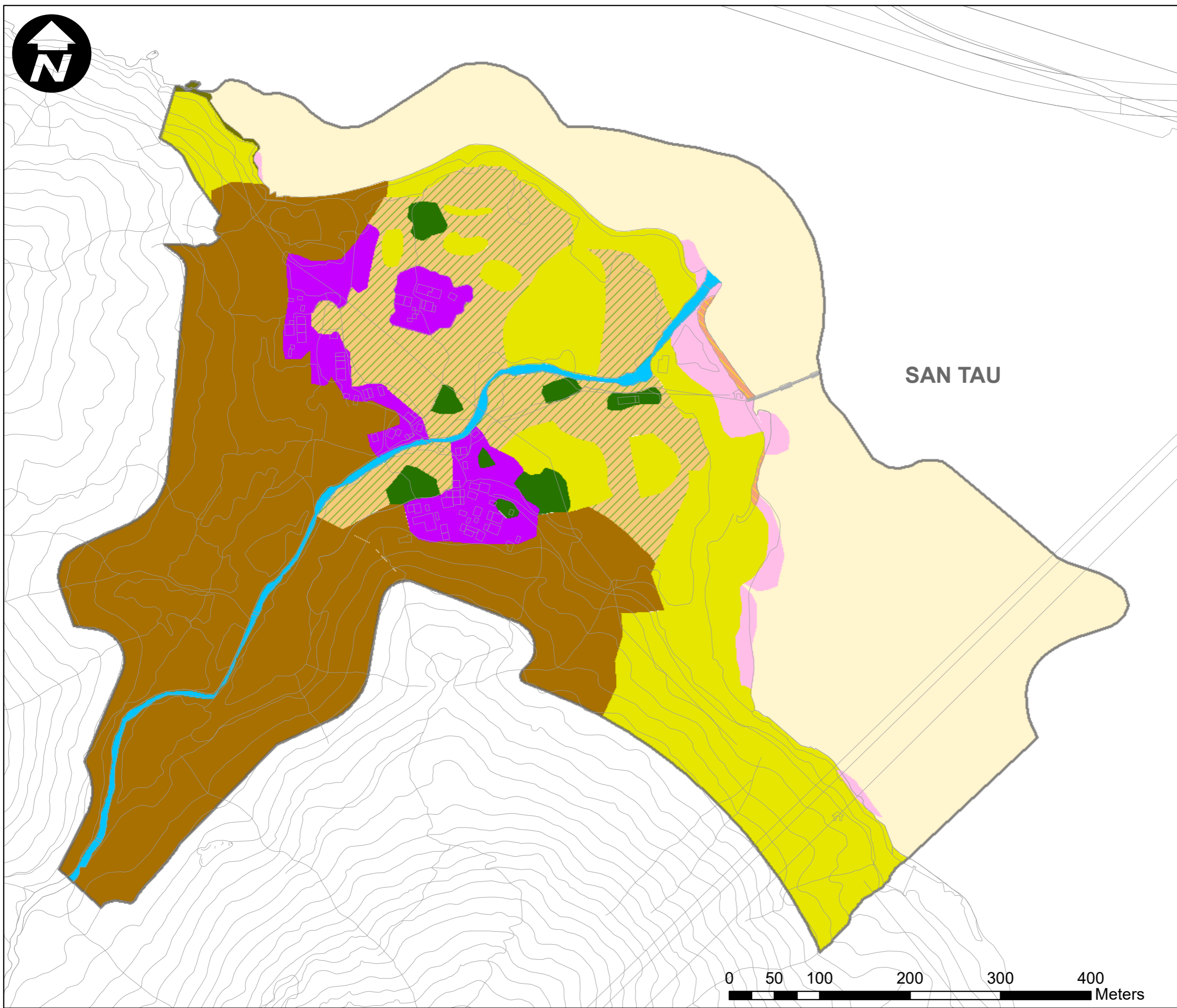
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Project  
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 ECOLOGICAL SURVEYS AND STUDIES FOR  
 SAN TAU TO SHAM WAT, YIO AND SHAP LONG  
 – FEASIBILITY STUDY**

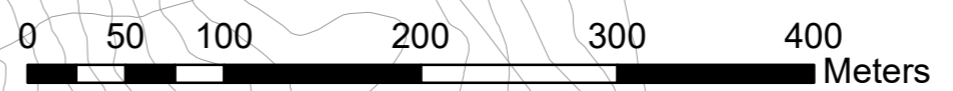
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Drawn	JC	Coordination	YL
Dwg check	N.A.	Approved	GC

Scale at A3: AS SHOWN Status: FINAL Rev: P1  
 Drawing Number: **FIGURE 2.2**



SAN TAU



Key Plan: 1 : 180,000



Notes:  
Note: All locations or extents presented are indicative only.

Key to symbols:

- LEGEND**
- SAN TAU SURVEY SITE
  - ABANDONED AGRICULTURAL LAND
  - ACTIVE AGRICULTURAL LAND
  - MANGROVE
  - MUDFLAT
  - ROCKY SHORE
  - SANDY SHORE
  - SHRUBLAND
  - VILLAGE
  - WATERCOURSE
  - WOODLAND
  - DEVELOPED AREA

P1	MAR 2023	JC		YL	GC
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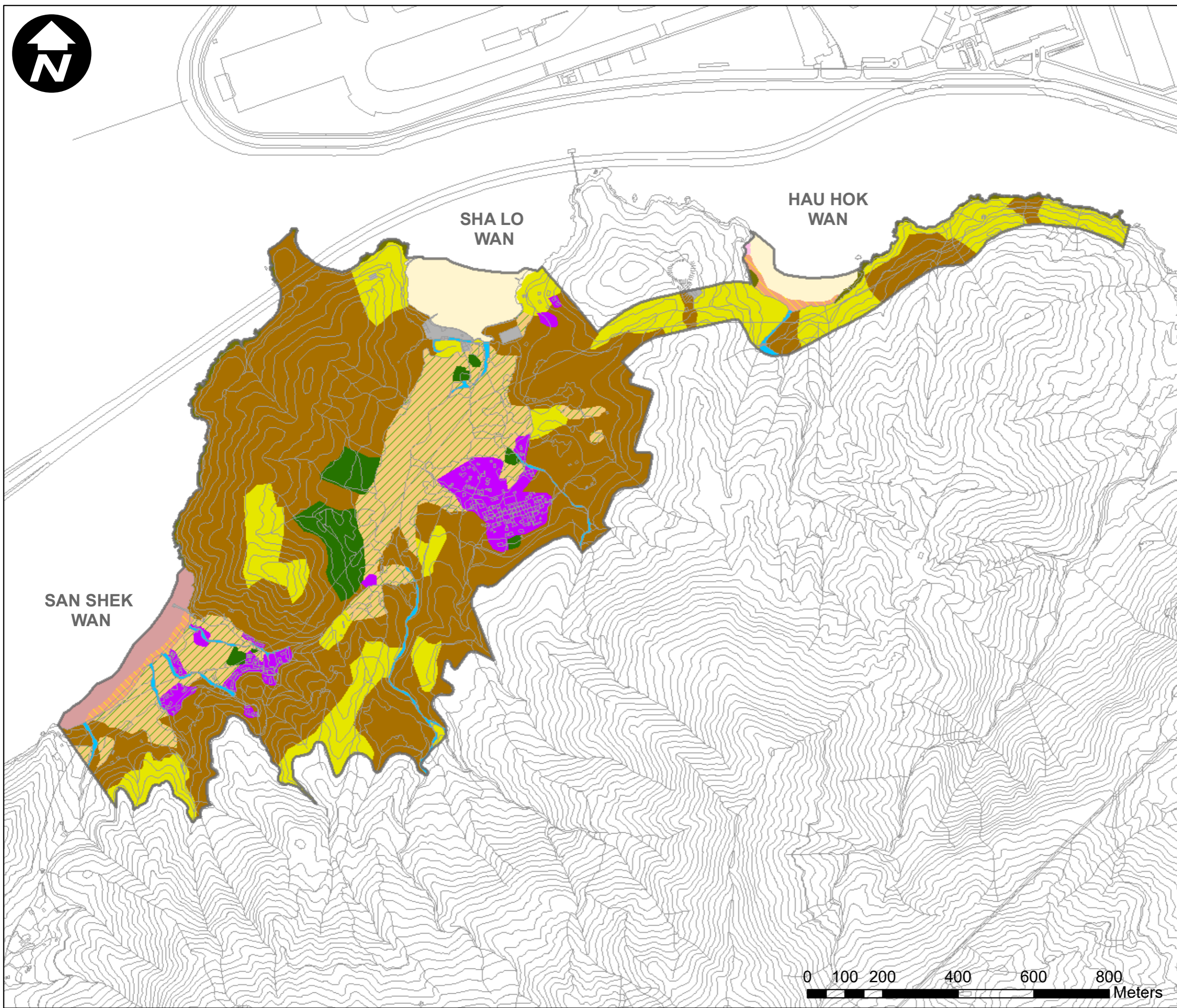
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**AGREEMENT NO. CE 61/2020 (SP)  
ECOLOGICAL SURVEYS AND STUDIES FOR  
SAN TAU TO SHAM WAT, YI O AND SHAP LONG  
- FEASIBILITY STUDY**

Title  
**HABITAT MAP OF SAN TAU SURVEY SITE**

Designed	JC	Eng check	N.A.
Drawn	JC	Coordination	YL
Dwg check	N.A.	Approved	GC
Scale at A3	AS SHOWN	Status	FINAL
Rev			P1

Drawing Number  
**FIGURE 2.3a**



Key Plan: 1:180,000



Notes:

Note: All locations or extents presented are indicative only.

Key to symbols:

**LEGEND**

- HAU HOK WAN TO SAN SHEK WAN SURVEY SITE
- ABANDONED AGRICULTURAL LAND
- ACTIVE AGRICULTURAL LAND
- BOULDER SHORE
- MANGROVE
- MUDFLAT
- ROCKY SHORE
- SANDY SHORE
- SHRUBLAND
- VILLAGE
- WATERCOURSE
- WOODLAND
- DEVELOPED AREA

P1	MAR 2023	JC		YL	GC
Rev	Date	Drawn	Description	Ch'k'd	App'd

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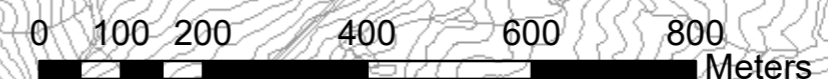
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**ECOLOGICAL SURVEYS AND STUDIES FOR SAN TAU TO SHAM WAT, YI O AND SHAP LONG – FEASIBILITY STUDY**

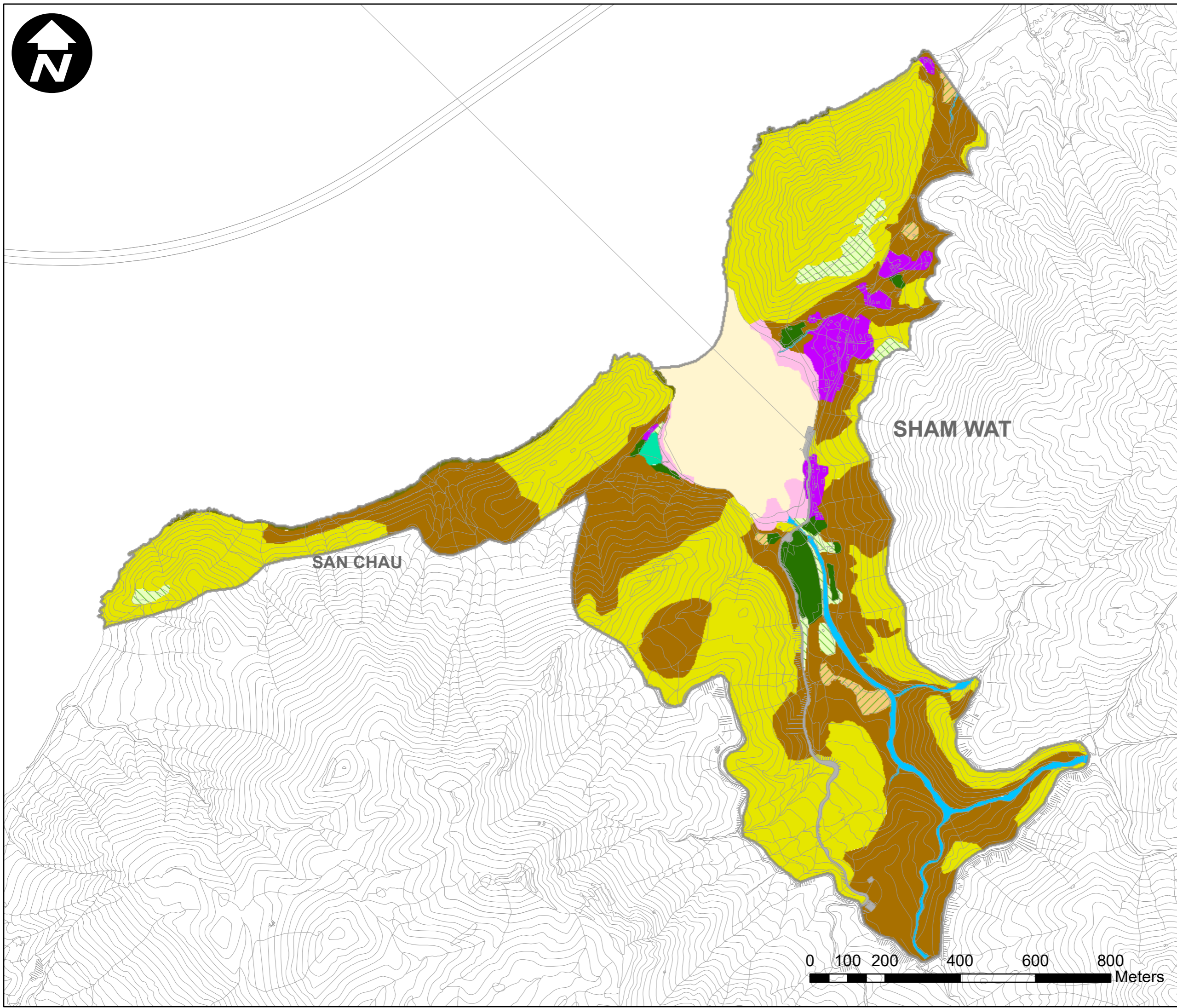
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Drawn	JC	Coordination	YL
Dwg check	N.A.	Approved	GC

Scale at A3	Status	Rev
AS SHOWN	FINAL	P1

Drawing Number **FIGURE 2.3b**





Key Plan: 1 : 180,000



Notes:  
 Note: All locations or extents presented are indicative only.

Key to symbols:

**LEGEND**

- SHAM WAT SURVEY SITE
- ABANDONED AGRICULTURAL LAND
- ACTIVE AGRICULTURAL LAND
- GRASSLAND
- MANGROVE
- MARSH
- MUDFLAT
- ROCKY SHORE
- SHRUBLAND
- VILLAGE
- WATERCOURSE
- WOODLAND
- DEVELOPED AREA

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Rev	Date	Drawn	Description	Ch'k'd	App'd

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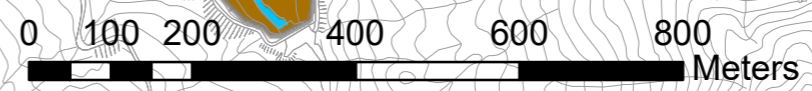
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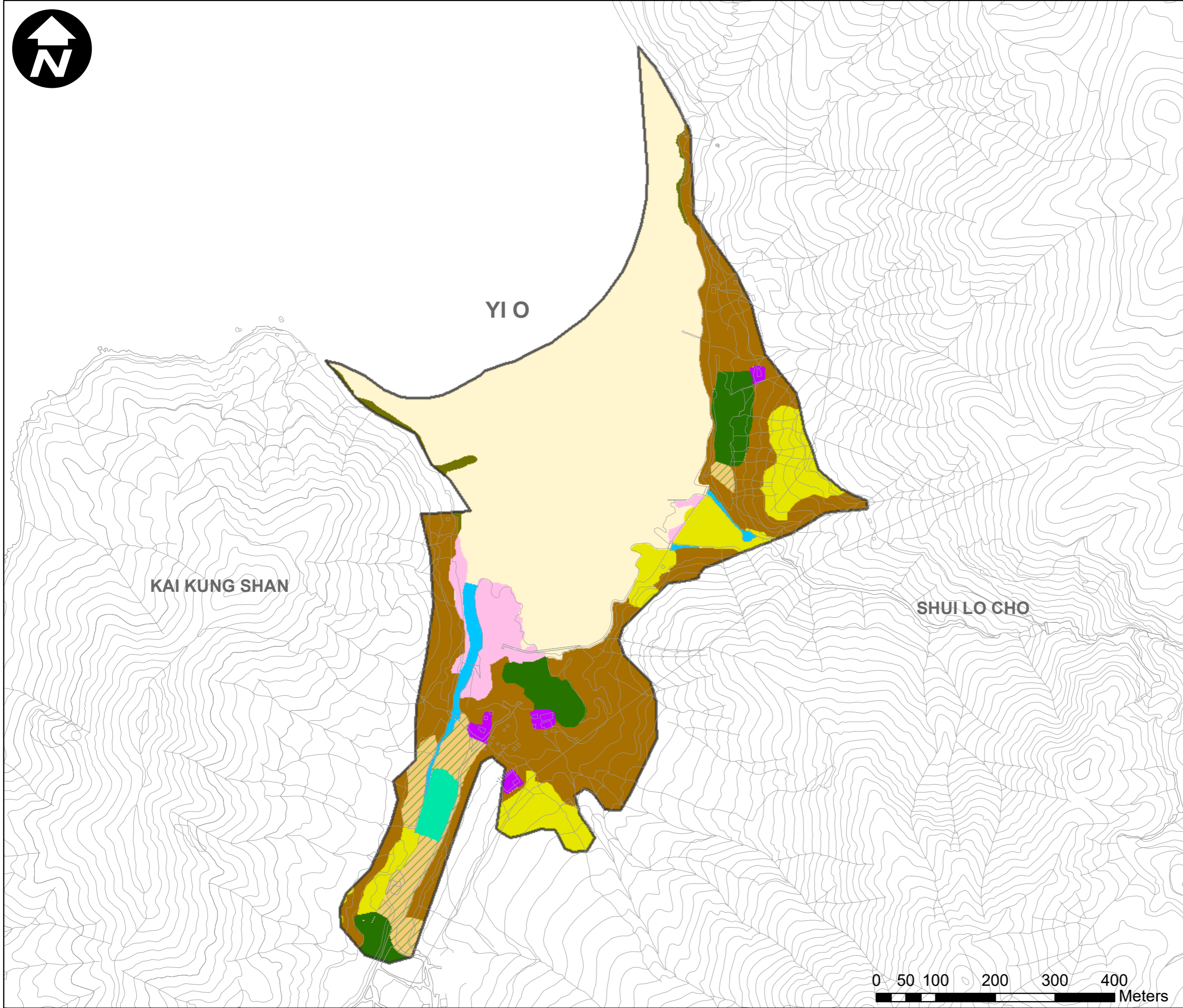
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 ECOLOGICAL SURVEYS AND STUDIES FOR  
 SAN TAU TO SHAM WAT, YI O AND SHAP LONG  
 – FEASIBILITY STUDY**

Title  
**HABITAT MAP OF  
 SHAM WAT SURVEY SITE**

Designed	JC	Eng check	N.A.
Drawn	JC	Coordination	YL
Dwg check	N.A.	Approved	GC
Scale at A3	AS SHOWN	Status	FINAL
Rev			P1

Drawing Number  
**FIGURE 2.3c**





Key Plan: 1:90,000



Notes:  
 Note: All locations or extents presented are indicative only.

Key to symbols:

**LEGEND**

	YI O SURVEY SITE
	ABANDONED AGRICULTURAL LAND
	ACTIVE AGRICULTURAL LAND
	MANGROVE
	MARSH
	MUDFLAT
	ROCKY SHORE
	SHRUBLAND
	VILLAGE
	WATERCOURSE
	WOODLAND

P1	FEB 2023	JC		YL	GC
Rev	Date	Drawn	Description	Ch'k'd	App'd

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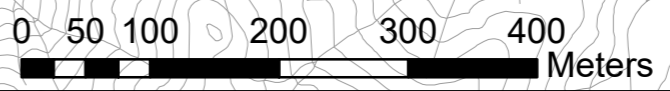
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**Civil Engineering and Development Department**

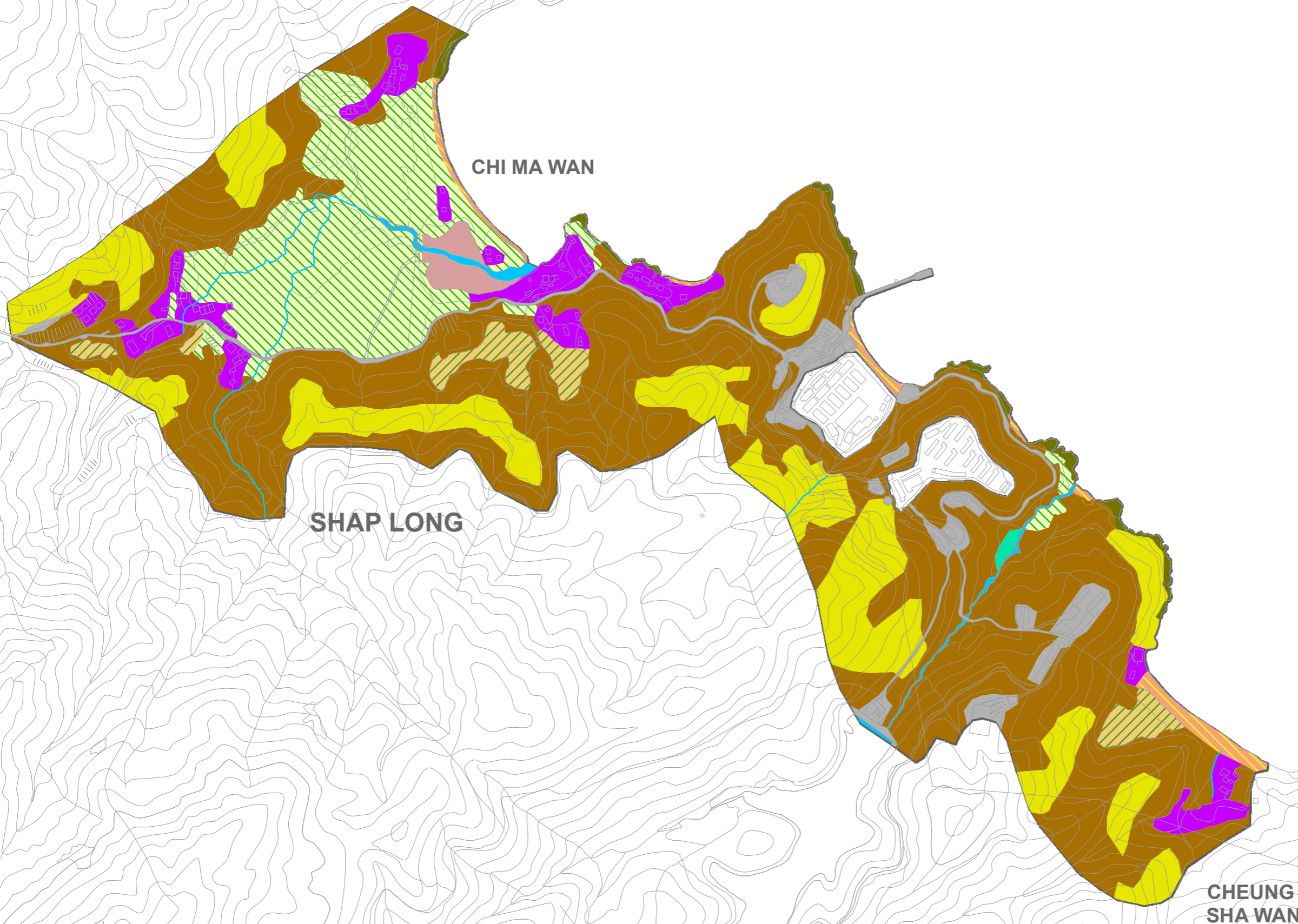
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**ECOLOGICAL SURVEYS AND STUDIES FOR**  
**SAN TAU TO SHAM WAT, YI O AND SHAP LONG**  
**- FEASIBILITY STUDY**

Title  
**HABITAT MAP OF YI O SURVEY SITE**

Designed	JC	Eng check	N.A.
Drawn	JC	Coordination	YL
Dwg check	N.A.	Approved	GC
Scale at A3	AS SHOWN	Status	FINAL
Rev			P1

Drawing Number  
**FIGURE 2.3d**





Key Plan 1: 90,000



Notes:

Note: All locations or extents presented are indicative only.

Key to symbols:

**LEGEND**

- SHAP LONG SURVEY SITE
- ABANDONED AGRICULTURAL LAND
- GRASSLAND
- MARSH
- ROCKY SHORE
- SANDY SHORE
- SANDFLAT
- SHRUBLAND
- VILLAGE
- WATERCOURSE
- WOODLAND
- DEVELOPED AREA

P1	FEB 2023	JC			YL	GC
Rev	Date	Drawn	Description		Ch'k'd	App'd

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**ECOLOGICAL SURVEYS AND STUDIES FOR**  
**SAN TAU TO SHAM WAT, YI O AND SHAP LONG**  
**- FEASIBILITY STUDY**

Title  
**HABITAT MAP OF SHAP LONG SURVEY SITE**

Designed	JC	Eng check	N.A.
Drawn	JC	Coordination	YL
Dwg check	N.A.	Approved	GC
Scale at A3	AS SHOWN	Status	FINAL
Rev			P1

Drawing Number **FIGURE 2.3e**





Key Plan: 1 : 180,000



Notes:

Note: All locations or extents presented are indicative only.

Key to symbols:

**LEGEND**

- SAN TAU SURVEY SITE
- HABITATS WITH SIGNIFICANT ECOLOGICAL VALUE**
- ABANDONED AGRICULTURAL LAND
- MUDFLAT
- SHRUBLAND
- WATERCOURSE (SAN TAU STREAM)
- WOODLAND
- HABITATS WITH CONSERVATION STATUS**
- SITE OF SPECIAL SCIENTIFIC INTEREST (SSSI)
- CONSERVATION AREA
- COASTAL PROTECTION AREA
- AREAS WITH THE NEED OF CONSERVATION MEASURES**
- INTERTIDAL MUDFLAT
- BUTTERFLY HOTSPOT
- LOWLAND STREAM AND ADJOINING HABITATS
- RECOMMENDED CONSERVATION MEASURE**
- EXTENT OF CONSERVATION MEASURES

P2	NOV 2023	JUT		YL	GC
P1	SEP 2023	JUT		YL	GC
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 ECOLOGICAL SURVEYS AND STUDIES FOR  
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 – FEASIBILITY STUDY**

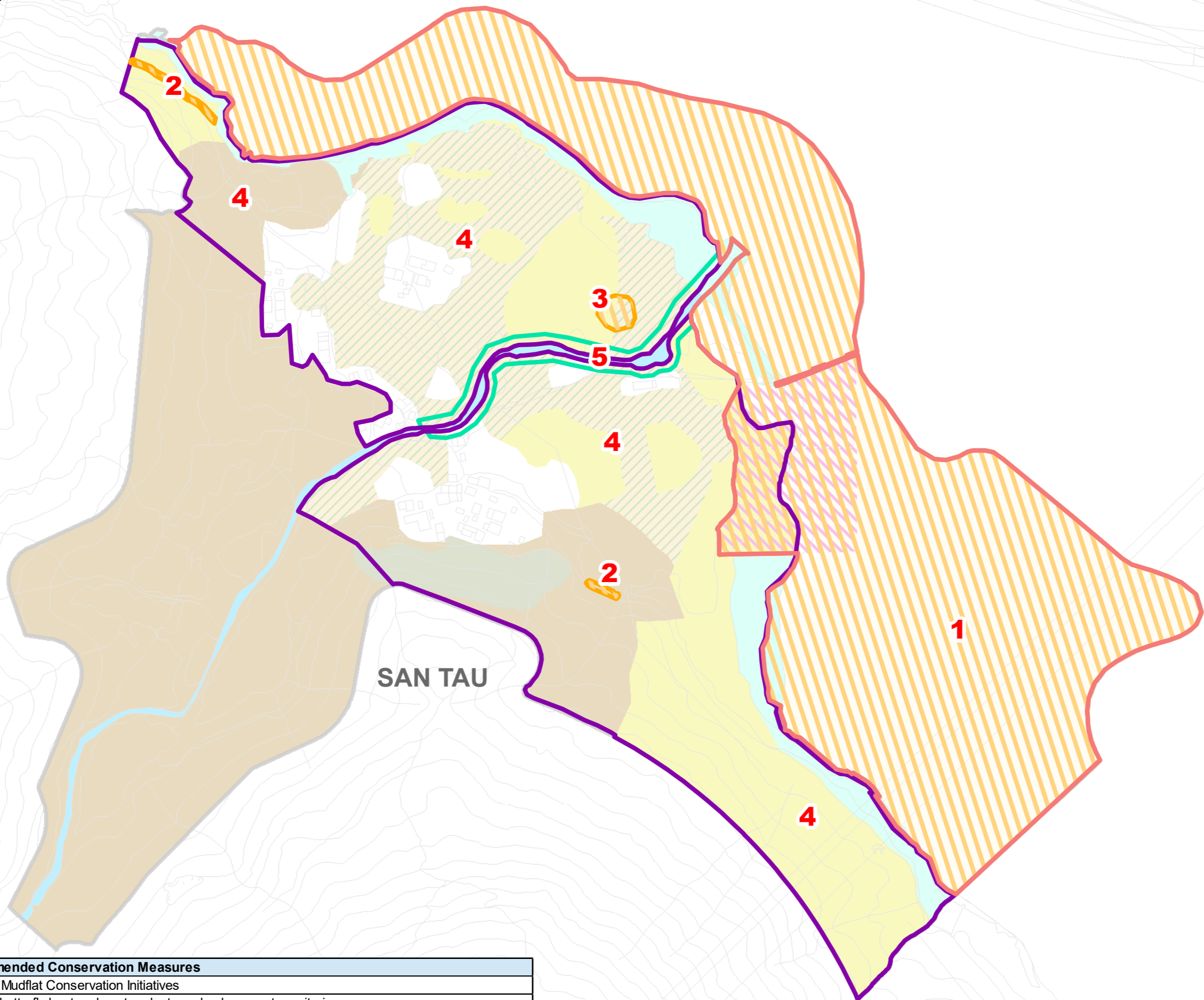
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 FOR SAN TAU SURVEY SITE**

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Dwg check	N.A.	Approved	GC

Scale at A3: AS SHOWN Status: FINAL Rev: P2

Drawing Number: **FIGURE 5.1a**

No.	Recommended Conservation Measures
1	Intertidal Mudflat Conservation Initiatives
2	Planting butterfly host and nectar plants and subsequent monitoring
3	Removal of Invasive Species (Mikania)
4	Ecological Monitoring Program for the Butterfly Hotspot
5	Ecological Monitoring Program for the Lowland Stream and Adjoining Habitats





No.	Recommended Conservation Measures
1	Intertidal Mudflat Conservation Initiatives
2	Planting Butterfly Host and Nectar Plants and Subsequent Monitoring

Key Plan: 1 : 180,000



Notes:

Note: All locations or extents presented are indicative only.

Key to symbols:

**LEGEND**

	HAU HOK WAN TO SAN SHEK WAN SURVEY SITE
<b>HABITATS WITH SIGNIFICANT ECOLOGICAL VALUE</b>	
	MUDFLAT
	SHRUBLAND
	WOODLAND
<b>HABITATS WITH CONSERVATION STATUS</b>	
	CONSERVATION AREA (CA)
	COASTAL PROTECTION AREA (CPA)
<b>AREAS WITH THE NEED OF CONSERVATION MEASURES</b>	
	INTERTIDAL MUDFLAT
	BUTTERFLY HOTSPOT
<b>RECOMMENDED CONSERVATION MEASURE</b>	
	EXTENT OF CONSERVATION MEASURES

P1	SEP 2023	JUT		YL	GC
Rev	Date	Drawn	Description	Ch'k'd	App'd

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Client

**CEDD** 土木工程拓展署  
Civil Engineering and  
Development Department

Project

AGREEMENT NO. CE 61/2020 (SP)  
ECOLOGICAL SURVEYS AND STUDIES FOR  
SAN TAU TO SHAM WAT, YI O AND SHAP LONG  
- FEASIBILITY STUDY

Title

RECOMMENDED CONSERVATION  
MEASURES FOR HAU HOK WAN TO  
SAN SHEK WAN SURVEY SITE

Designed	JC	Eng check	N.A.	
Drawn	JUT	Coordination	YL	
Dwg check	N.A.	Approved	GC	
Scale at A3	AS SHOWN	Status	FINAL	Rev
Drawing Number				P1

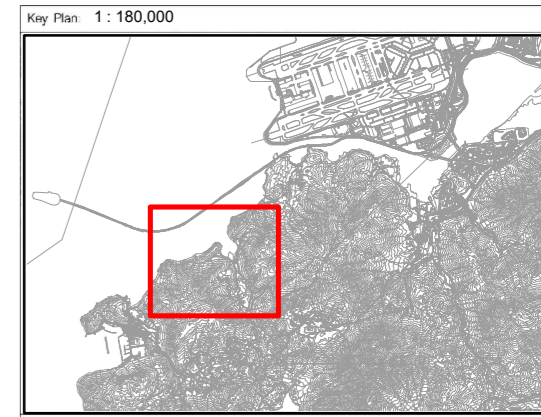
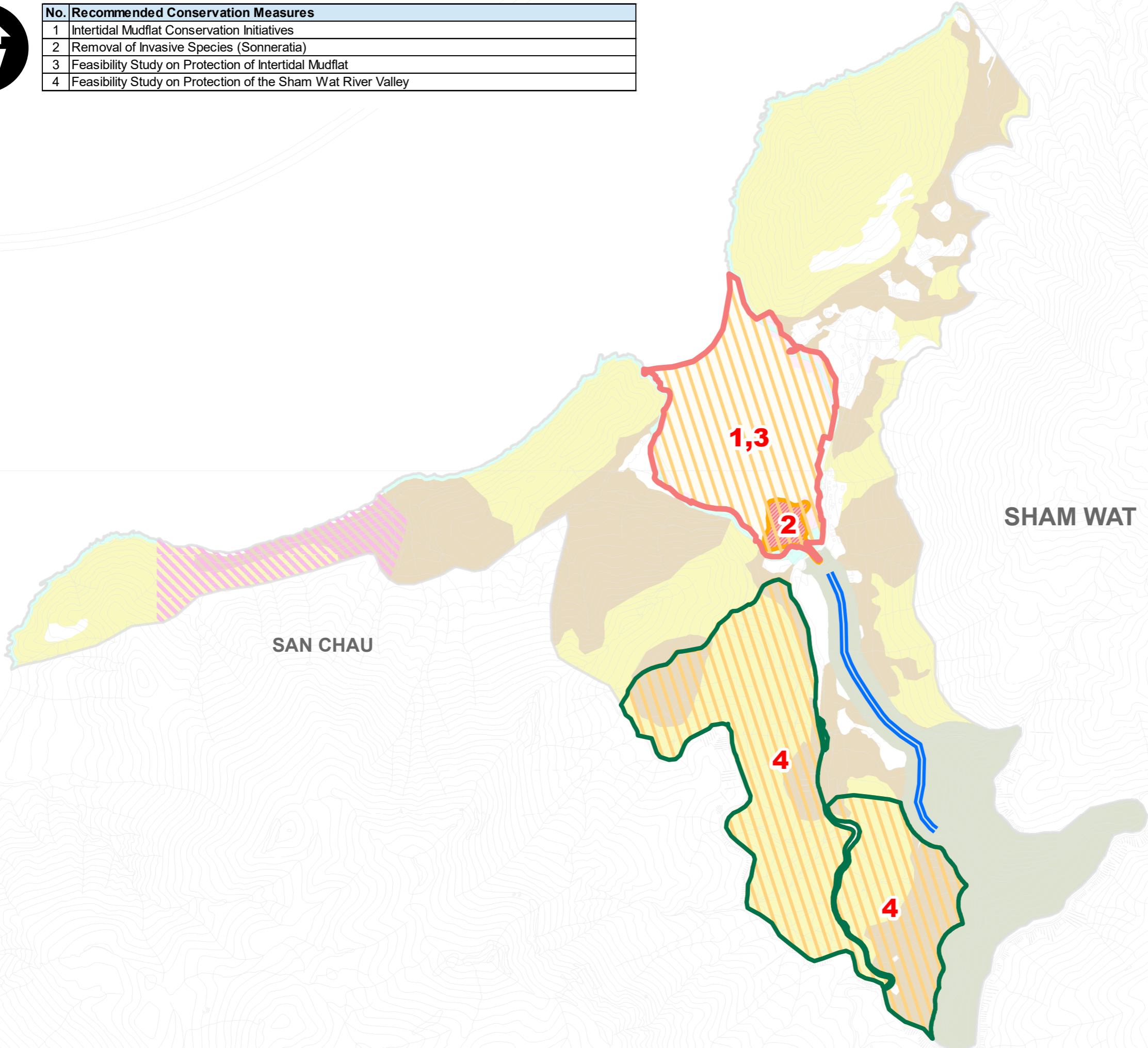
0 100 200 400 600 800 Meters

FIGURE 5.1b





No.	Recommended Conservation Measures
1	Intertidal Mudflat Conservation Initiatives
2	Removal of Invasive Species (Sonneratia)
3	Feasibility Study on Protection of Intertidal Mudflat
4	Feasibility Study on Protection of the Sham Wat River Valley



Notes:  
 Note: All locations or extents presented are indicative only.

Key to symbols:

**LEGEND**

SHAM WAT SURVEY SITE

**HABITATS WITH SIGNIFICANT ECOLOGICAL VALUE**

- MANGROVE
- MUDFLAT
- SHRUBLAND
- WOODLAND
- WATERCOURSE (SHAM WAT STREAM EIS)

**HABITATS WITH CONSERVATION STATUS**

- CONSERVATION AREA (CA)
- COASTAL PROTECTION AREA (CPA)
- SITE OF SPECIAL SCIENTIFIC INTEREST (SSSI)

**AREAS WITH THE NEED OF CONSERVATION MEASURES**

- INTERTIDAL MUDFLAT
- RIVER VALLEY

**RECOMMENDED CONSERVATION MEASURE**

- EXTENT OF CONSERVATION MEASURES

					GC
P1	SEP 2023	JUT			YL GC
Rev	Date	Drawn	Description		Ch'k'd App'd

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 – FEASIBILITY STUDY

Title  
 RECOMMENDED CONSERVATION MEASURES  
 FOR SHAM WAT SURVEY SITE

Designed	JC	Eng check	N.A.	
Drawn	JUT	Coordination	YL	
Dwg check	N.A.	Approved	GC	
Scale at A3	AS SHOWN	Status	FINAL	Rev
Drawing Number				P1

FIGURE 5.1c



No.	Recommended Conservation Measures
1	Intertidal Mudflat Conservation Initiatives
2	Removal of Invasive Species (Sonneratia)
3	Paddy Field Expansion
4	Ecological Monitoring Program for the Active Farmlands
5	Ecological Research and Monitoring Program for the lowland river

Key Plan: 1 : 90,000



Notes:

Note: All locations or extents presented are indicative only.

Key to symbols:

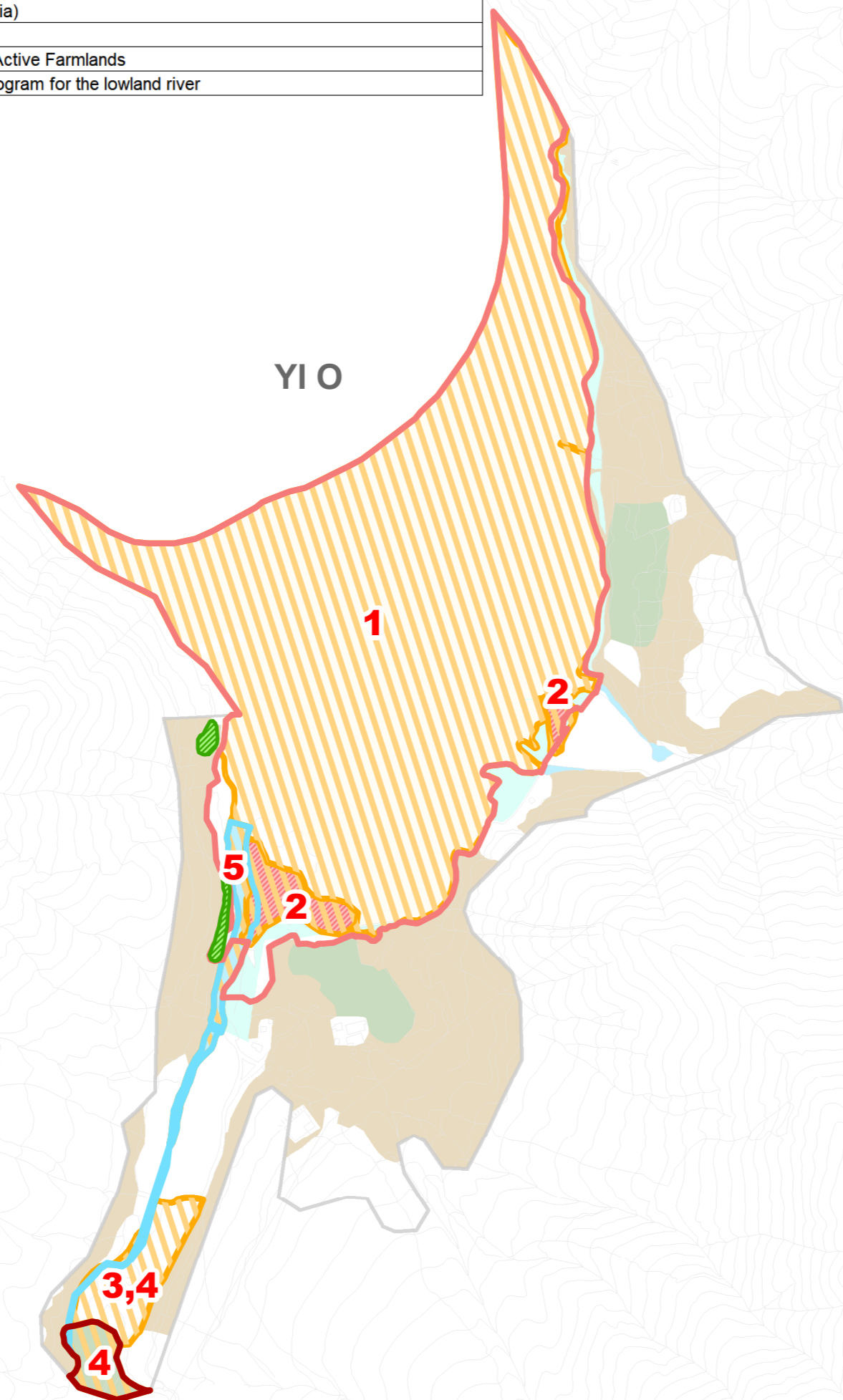
**LEGEND**

- YI O SURVEY SITE
- HABITATS WITH SIGNIFICANT ECOLOGICAL VALUE**
  - ACTIVE AGRICULTURAL LAND
  - MUDFLAT
  - WATERCOURSE
  - WOODLAND
- HABITATS WITH CONSERVATION STATUS**
  - COASTAL PROTECTION AREA (CPA)
- AREAS WITH THE NEED OF CONSERVATION MEASURES**
  - INTERTIDAL MUDFLAT
  - PADDY FIELDS AND ADJOINING HABITATS
  - LOWLAND RIVER
- RECOMMENDED CONSERVATION MEASURE**
  - RECOMMENDED CONSERVATION MEASURE

KAI KUNG SHAN

YI O

SHUI LO CHO



P1	SEP 2023	JUT		YL	GC
Rev	Date	Drawn	Description	Ch'k'd	App'd

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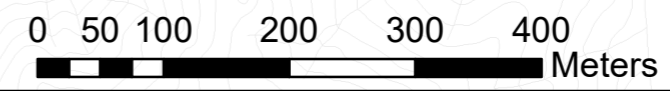
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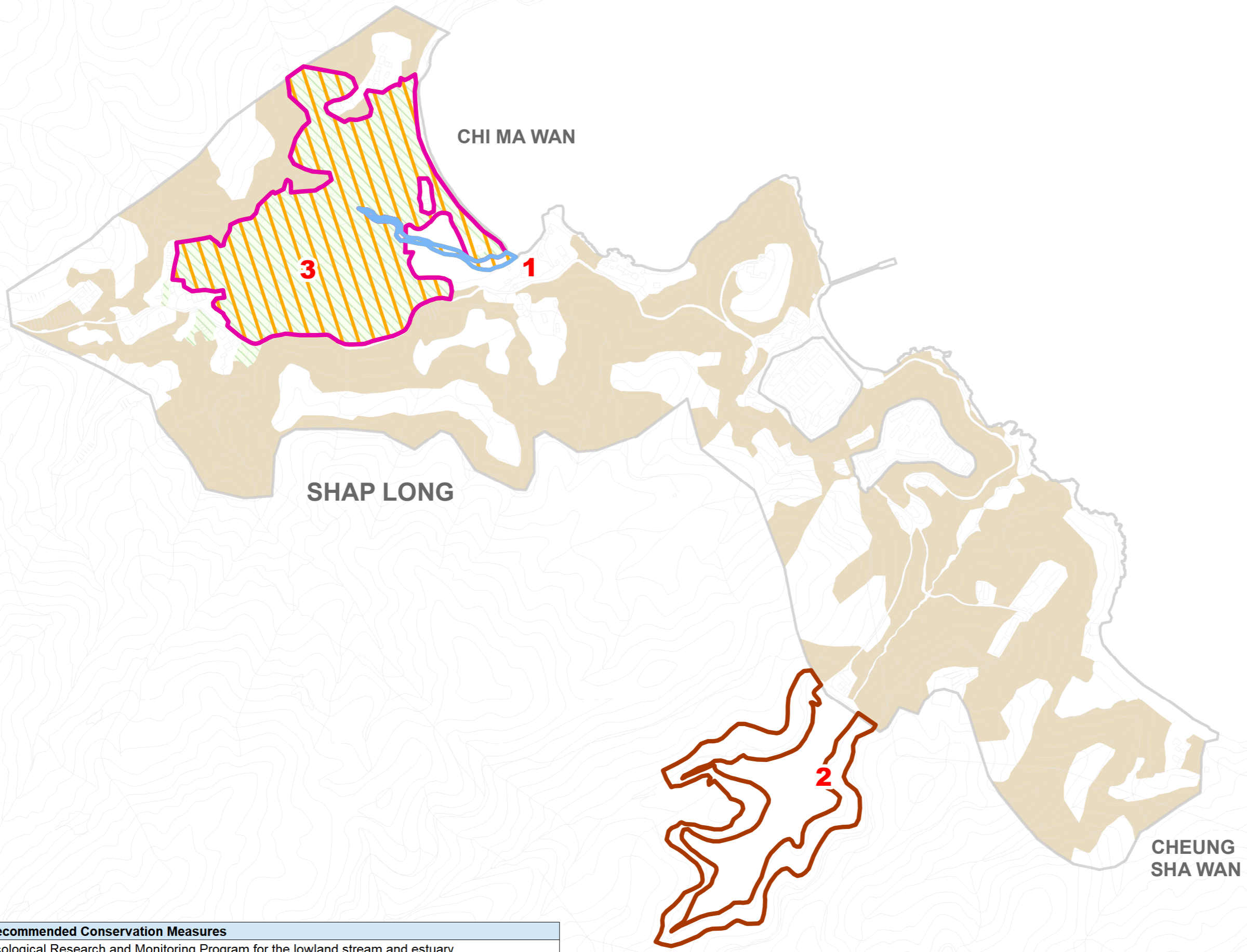
Project  
**AGREEMENT NO. CE 61/2020 (SP)  
 ECOLOGICAL SURVEYS AND STUDIES FOR  
 SAN TAU TO SHAM WAT, YI O AND SHAP LONG  
 – FEASIBILITY STUDY**

Title  
**RECOMMENDED CONSERVATION MEASURES  
 FOR YI O SURVEY SITE**

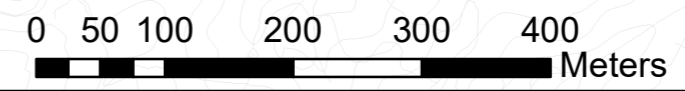
Designed	JC	Eng check	N.A.
Drawn	JUT	Coordination	YL
Dwg check	N.A.	Approved	GC
Scale at A3	Status	Rev	
AS SHOWN	FINAL	P1	

Drawing Number **FIGURE 5.1d**





No.	Recommended Conservation Measures
1	Ecological Research and Monitoring Program for the lowland stream and estuary
2	Ecological Monitoring Program for the ardeid's roost
3	Ecological Monitoring for the grassland



Key Plan 1 : 90,000



Notes:  
Note: All locations or extents presented are indicative only.

Key to symbols:

**LEGEND**

- SHAP LONG SURVEY SITE
- HABITATS WITH SIGNIFICANT ECOLOGICAL VALUE**
  - GRASSLAND
  - WOODLAND
- AREAS WITH THE NEED OF CONSERVATION MEASURES**
  - LOWLAND STREAM AND ESTUARY
  - SHRUBLANDS AND WOODLANDS EDGING SHAP LONG IRRIGATION RESERVOIR
  - GRASSLAND
- RECOMMENDED CONSERVATION MEASURE**
  - EXTENT OF CONSERVATION MEASURES

P1	SEP 2023	JUT		YL	GC
Rev	Date	Drawn	Description	Ch'k'd	App'd

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- FEASIBILITY STUDY**

Title

**RECOMMENDED CONSERVATION MEASURES  
FOR SHAP LONG SURVEY SITE**

Designed	JC	Eng check	N.A.	
Drawn	JUT	Coordination	YL	
Dwg check	N.A.	Approved	GC	
Scale at A3	AS SHOWN	Status	FINAL	Rev
Drawing Number				P1

**FIGURE 5.1e**

