

HONG KONG
HEADLINE INDICATORS FOR
BIODIVERSITY AND
CONSERVATION
2018-2020



The Hong Kong Bird Watching Society is a non-governmental organization established in 1957 with a vision of “people and birds living in harmony as nature continues to thrive”. It aims to promote the appreciation and protection of birds and their habitats through education, research, habitat management and conservation advocacy. The Society became a public charitable organization in 2002, an Associate Member of BirdLife International in 1994, a BirdLife International Partner in 2013, and the 38th Partner of the East Asian-Australasian Flyway Partnership in 2020.

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BACKGROUND

"*Hong Kong Headline Indicators for Biodiversity and Conservation*" is the only systematic monitoring of the state and progress of biodiversity conservation in Hong Kong. This is the fifth report of the same series, which reports on data collected on selected indicator species and observed developments over the past ten years. Under each headline indicator, the report documents and comments on the conservation issues and incidents from 2017-2020. Commentary on data in earlier years can also be found in previous reports (2011-2017)¹.

Selection of headline indicators

A draft set of indicators were suggested by Civic Exchange in its report *Nature Conservation: A new policy framework for Hong Kong² ("The Framework")* which was published in January 2011. These indicators were drafted based on discussions with environmental Non-governmental Organizations (NGOs), academics, consultants, officials and other stakeholders. The indicators were selected based on the following criteria:

1. Are they consistent with the strategic objectives of the Convention on Biological Diversity (CBD) and the Framework?
2. Are they scientifically robust?
3. Are they clearly defined, logical and easy to understand?
4. Could the information be readily obtained?
5. Are they easily comprehensible by the public?
6. Will they drive positive changes in biodiversity conservation?

These indicators were also assessed using the CBD's pressure-state-response framework, so as to determine if they represent, (i) the direct or indirect human-induced pressures on biodiversity; (ii) the state of biodiversity at species, community or habitat levels; or (iii) the measures taken to address the state, pressure or use of biodiversity. They are headline indicators which have priorities of public concern and are intended to provide a high-level overview. In this report, a brief background of each headline indicator is included at the beginning of each section to illustrate the broad picture that the indicator intends to provide.

Protecting our biodiversity also plays a critical role in retaining Hong Kong's position as the most liveable city in China, particularly in the Bay Area of the Pearl River Estuary. These indicators provide a broad picture of the state of both biodiversity and conservation in Hong Kong. The Hong Kong Bird Watching Society (HKBWS) publishes these indicators from time to time so that the community can measure its progress in protecting, managing and enhancing our biodiversity in line with international best practice as expressed through the CBD and through Hong Kong's own Biodiversity Strategy and Action Plan (BSAP).

Data collection and a consistent set of indicators

The chosen indicators should be consistent so that results and trends can be tracked from year to year. The indicators also highlight areas where data should be collected in order for the Hong Kong community to have an accurate picture of its biodiversity and conservation initiatives. New data included in this report but not published in previous reports is highlighted in yellow.

More data gaps were filled in the current report, particularly information and data for various threatened species, invasive species and areas with management plans, giving a more complete picture of the status of biodiversity conservation in Hong Kong.

OVERVIEW

BIODIVERSITY CONSERVATION IN HONG KONG 2018-2020

Much progress was made under indicator 5.1 (Plans and Resources for Biodiversity Conservation), which measures the time before Hong Kong has an approved, resourced, and actively managed BSAP. Hong Kong's first BSAP was announced during the last report in this series (2015-2017), while this report (2018-2020) covered the implementation of the BSAP. A major achievement under the BSAP include the formulation of the Hong Kong Red List of Threatened Species, which can better reflect the importance of these species and the threats they are facing at a local and regional scale (please refer to section 2.1). This hopefully can tie in with the relevant assessment or enforcement under the current ordinances and provide enhanced protection to these threatened species and their habitats in Hong Kong. As for the control of transportation of threatened species across borders, the penalties imposed on offenders under the Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586, amended in 2018) seemed to be heavier than before, as illustrated in cases where endangered species were being smuggled by carriers or mules (please refer to Box 10).

In addition, a significant step forward for the management of marine parks was the implementation of the new Fisheries Management Strategy in 2019, which banned commercial fishing in four marine parks to conserve the coral communities and fisheries resources (please refer to section 3.1). While this aspect is not covered by these indicators, Hong Kong's protected area network continues to provide a broadly effective regulatory framework for nature conservation, as can be seen by the increase in the extent and maturity of secondary forest habitats and the establishment of breeding populations of bird species that depend on mature forests such as Brown Wood Owl, Bay Woodpecker and Chinese Barbet continues.

Mainstreaming biodiversity across all Government departments, industry sectors and the general public were promoted under the BSAP, and some works departments such as Drainage Services Department (DSD) and Water Supplies Department (WSD) have incorporate nature conservation and ecological elements into their works (please refer to section 3.3). Even so, a huge burden still lies on the shoulders of Agriculture, Fisheries and Conservation Department (AFCD) and Environment Bureau to coordinate with different Government departments to mainstream conservation into government policy and legislation, which becomes very difficult when there are conflicting economic and development issues at play. Ongoing disturbance and habitat destruction caused by development continue to threaten species such as the Chinese White Dolphins (CWD) in North Lantau waters and waterbirds in the Deep Bay area. Both showed a continuous declining trend in their numbers (please refer to section 3.5). However, Hong Kong still has no specific targets or timetable for the Government to protect both the terrestrial and marine environment through the protected area network (e.g. country parks and marine parks).

Agricultural land, Green Belt and Country Parks continued to be targeted as sources of land supply for housing and infrastructure development through a number of Government initiatives. These included a public consultation on land supply launched in 2018, ongoing rezoning of Green Belt land and new measures to open up more agricultural land for development (please refer to sections 3.1 and 3.2).

In addition to the "hobby farms" as identified in our last report, new threats from "animal boarding establishment" and "solar energy system installations" were observed in recent years, particularly in Agriculture (AGR) zones (please refer to Boxes 5, 6 and 11). All these land uses and developments deviate from the statutory planning intention of the designated

zoning/area to conserve habitats of conservation importance and arable farmlands as stated in various ordinances and other regulatory frameworks. Although efforts were made to address the increasing complaints of unauthorized activities in rural areas received by Planning Department (PlanD) and Lands Department (LandsD) in recent years, the Unauthorized Developments (UDs) observed continue to show the limitations of the enforcement actions by PlanD, LandsD and Environmental Protection Department (EPD). Unauthorized activities encroaching country parks were also detected (please refer to section 1.1, and Box 4).

On a more positive note, the effort to remove invasive alien species (IAS) has increased. In particular AFCD's control of the invasive House Crow continues to be effective (please refer to section 3.4). However, much more systematic actions and schemes are needed to monitor and remove IAS effectively – including Mikania, Apple Snails and *Sonneratia* mangroves – in order to prevent them from spreading further.

Overall, Hong Kong's ecological footprint deficit continues to worsen; only the per capita emission of greenhouse gas showed a slowly decreasing trend. Ambitious but achievable strategies are needed to reduce Hong Kong's ecological footprint and the city's significant impact on global biodiversity resulting from its activities as a trading hub for a range of often threatened species, including both live animals and their products (reptiles, amphibians, birds, mammals, marine species, etc.) as well as multiple plant species including precious timber (please refer to sections 4.1 and 4.2).

Looking forward

Now that ten years of data have been collected in this series of reports, a further review of Hong Kong's performance in biodiversity conservation in the past decade will be conducted and documented separately. The ten-year review will provide an opportunity to document the city's response to the CBD, raise public awareness on biodiversity both within and beyond Hong Kong, and provide an important reference for the Government in their preparation of the next BSAP, which is expected to be launched in 2022.

Furthermore, HKBWS is planning to review the current set of indicators, such that they can monitor if any necessary alignments with the Post-2020 Biodiversity Framework can be achieved by Hong Kong. The Framework will be adopted in the upcoming meeting of the Conference of the Parties to the CBD in 2021. As such, the state of biodiversity and conservation efforts in Hong Kong, together with the implementation of the current and future BSAPs, can be regularly and effectively monitored without losing focus on the original intent of CBD to conserve biological diversity and to ensure the sustainable use of its components.

1

HEADLINE INDICATOR 1: COMMUNITY-BASED CONSERVATION

1.1 Percentage of instances of illegal/ unauthorized activity (trashing, trapping, collection, etc.) reported per year by environmental NGOs and verified sources (e.g. media and websites) where enforcement action led to a) successful prosecution and b) restoration of ecological function.

This indicator demonstrates the pressure of environmentally destructive activities in Hong Kong, and also shows the *capacity* and *determination* of government authorities to respond effectively to identify illegal/unauthorized activities. Data are from both the government departments concerned (i.e. Planning Department, Lands Department, Agriculture, Fisheries and Conservation Department), and those collected by environmental NGOs.

Unauthorized activities reported by environmental NGOs

The number of cases reported by environmental Non-governmental Organizations (NGOs) fluctuated yearly without any trends. The reported unauthorized activities included vegetation clearance, dumping of construction waste, pond/land filling, land excavation, filling of rivers and different brownfield operations. Fifty seven cases were reported in 2017 of which over 40% of the cases led to successful prosecution and 10 sites had their ecological function restored, which was the highest during this reporting period.

Among the 116 cases reported in the past three years, 17 have still not received replies from relevant departments on the actions taken at the time of writing (end of 2020). For some cases, the handling time could be as long as over two years. Moreover, environmental NGOs also stated that it is hard to obtain the latest status of the cases and whether a prosecution

TABLE 1 Information on unauthorized activities reported by NGOs (2009 - 2019)

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	
No. of cases reported	37	35	27	26	33	19	31	33	57	24	35	
Successful prosecution (% of reported cases)	2 (5.4%)	3 (8.5%)	0 (0%)	0 (0%)	1 (3%)	4 (21%)	10 (32%)	3 (9%)	24 (42%)	7 (29%)	5 (14%)	
Restoration of ecological function (% of reported cases)	None restored								2 (6%)	10 (18%)	2 (8%)	1 (3%)

was made. Although Planning Department (PlanD) upgraded the planning portal system in 2014³, this still does not allow the public to monitor the status of enforcement actions against various Unauthorized Developments (UDs). They are only accessible via the computers at the two Planning Enquiry Counters.

Among the 80 cases reported by environmental NGOs from 2017 to 2019 which were not prosecuted, over 30 were related to the South Lantau Coast – particularly Pui O, Mui Wo, Cheung Sha and Tong Fuk (Figure 1, and please refer to Box 1) - which has never

been covered by a Development Permission Area (DPA) plan. PlanD is empowered by the Town Planning Ordinance (TPO) to carry out enforcement actions only in areas covered by a DPA or an Outline Zoning Plan (OZP) which has replaced a DPA, which means areas covered by OZP only or without any statutory plans are not protected under the TPO. Among the cases reported by environmental NGOs, there was one exceptional case where the suspected unauthorized development was related to an approved Environmental Impact Assessment (EIA) project (please refer to Box 2).

TABLE 2 Information from PlanD and LandsD regarding UD in rural areas[^] from 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
No. of complaints received by PlanD	644	604	778	870	944	845	1,089	859	1,079	1,194	1,097
Enforcement not possible under TPO due to absence of DPA (% of total complaints)	37 (6%)	23 (4%)	46 (6%)	41 (5%)	22 (2%)	36 (4%)	35 (3%)	31 (4%)	44 (4%)	51 (4%)	55 (5%)
Confirmed cases of UD (% of total complaints)	115 (18%)	100 (17%)	148 (19%)	138 (16%)	113 (12%)	130 (15%)	156 (14%)	154 (18%)	199 (18%)	213 (18%)	158 (14%)
Reinstatement notice (RN) issued (% of confirmed UD)	25 (22%)	19 (19%)	30 (20%)	41 (30%)	12 (11%)	24 (18%)	31 (20%)	22 (14%)	83 (42%)	68 (32%)	33 (21%)
Discontinued (% of confirmed UD)	68 (59%)	26 (26%)	58 (39%)	46 (33%)	12 (11%)	31 (24%)	59 (38%)	27 (18%)	133 (67%)	77 (36%)	21 (13%)
Regularized by the TPB (% of confirmed UD)	13 (11%)	7 (7%)	5 (3%)	7 (5%)	2 (2%)	3 (2%)	3 (2%)	2 (1%)	16 (8%)	8 (4%)	4 (3%)
Undergoing different stages of enforcement or prosecution actions (% of confirmed UD)	24 (21%)	61 (61%)	76 (51%)	75 (54%)	92 (81%)	80 (62%)	86 (55%)	120 (78%)	50 (25%)	128 (60%)	133 (84%)
Successful prosecutions made by PlanD (% of confirmed UD)	6 (5%)	3 (3%)	1 (1%)	2 (1%)	0 (0%)	2 (2%)	2 (1%)	1 (1%)	26 (13%)	5 (2%)	11 (7%)
UDs also referred to LandsD (% of confirmed UD)	56 (49%)	46 (46%)	80 (54%)	93 (67%)	78 (69%)	84 (65%)	91 (58%)	66 (43%)	199 (100%)	201 (94%)	128 (81%)
Land control or lease enforcement actions taken (% of total cases referred to LandsD)	10 (18%)	10 (22%)	21 (26%)	9 (10%)	16 (21%)	12 (14%)	44 (48%)	22 (33%)	38 (19%)	70 (35%)	27 (21%)
Successful prosecution made by LandsD	0	1	0	0	0	0	0	0	0	0	0

[^] Rural areas include Site of Special Scientific Interest (SSSI), Coastal Protection Area (CPA), Conservation Area (CA), Green Belt (GB), Agriculture (AGR) and Village Type Development (V) zones.

Regarding the sites of ecological/conservation value affected by UD, the direct investigation report published by Office of The Ombudsman on Government's control over fly-tipping of construction waste and landfilling activities on private land completed in January 2018⁴ recommended PlanD "to require the RN (Reinstatement notice) recipients as far as possible to fully reinstate the sites to their original state in order to achieve the purpose of conservation". This gives clear guidance to PlanD that RNs should be framed to achieve the conservation objective and enforced with an intention to achieve the purpose of ecological restoration.

However, there is no information regarding any revision of the RNs issued, in response to the above recommendation. Many wetlands and marshes still fail to be fully reinstated under the current system, as illustrated in the eco-vandalism at Sha Ling in the New Territories, where the affected land was not reinstated back to wetlands despite the successful prosecution and RN issued (please refer to Box 2). It is clear that PlanD needs to explore other administrative measures or collaboration with

other relevant departments (e.g. AFCD) in order to ensure the ecological function of the affected land especially for wetlands are properly restored.

Complaints of UD handled by PlanD and LandsD

From 2017 to 2019, the number of complaints received by PlanD in rural areas (i.e. Site of Special Scientific Interest (SSSI), Coastal Protection Area (CPA), Conservation Area (CA), Green Belt (GB), Agriculture (AGR) and Village Type Development (V) zones) per year exceeded 1,000 cases (amounting to 3,370 in total) – which represent a 20% increase on the previous three year period. Around 5% were cases where enforcement was not possible under the TPO due to the continuing absence of DPA plans.

Over the three years, around 17% of the 3,000 and more complaints received was confirmed to be UD. Among the 570 UD confirmed, 32% have RN issued, 67% were undergoing different stages of enforcement or prosecution, while only 7% were successfully prosecuted.

TABLE 3 Information from AFCD on illegal activities in country parks from 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
No. of reports	12	26	64	67	96	134	120	54	53	41	32
Successful prosecutions	1 (8%)	7 (27%)	29 (45%)	22 (33%)	9 (9%)	30 (22%)	5 (4%)	7 (13%)	1 (2%)	0 (0%)	0 (0%)

FIGURE 1



Illegal dumping at wetlands in Tong Fuk, however, enforcement not possible under TPO due to absence of DPA.

A total of 528 cases were referred to LandsD for their follow-up actions, and about 27% had undergone land control or lease enforcement actions, but LandsD again made no successful prosecutions.

The efforts of PlanD and LandsD in enforcement increased with the number of complaints received, yet there are still long-standing limitations as illustrated in a number of cases followed-up by environmental NGOs (please refer to Box 1). Land owners may seek regularization of the unauthorized activities on their land through applying for planning permission to the Town Planning Board (TPB). However, planning applications at these sites may not necessarily lead to the rejection of the application since “destroy first, build later” is just one aspect of TPB’s considerations in their decision making process (please refer to Box 3).

Unauthorized activities within country parks

Illegal activities in country parks are indicated by the number of reports of illegal felling of Incense Trees. Reports decreased from 53 in 2017 to 32 in 2019, but only one case was successfully prosecuted in these three years.

According to the working papers of the Country and Marine Parks Board⁵, about 900 cases of illegal activities per year were identified by AFCD and enforcement actions were taken under the Country Parks Ordinance (Cap. 208), Forests and Countryside Ordinance (Cap. 96) and Wild Animals Protection Ordinance (Cap.170). These activities mainly include illegal entry of bicycle and vehicle, camping outside designated camping site, littering, and illegal feeding of wild animal. Besides the above, there are also some suspected unauthorized activities within country parks. In 2017, excavation and vegetation clearance were detected at Wong Chuk Yeung, Sai Kung. Part of the affected area was within the Ma On Shan Country Park. The Agriculture, Fisheries and Conservation Department erected warning signs at the site and stepped up patrols of the area. There was also one case of encroachment into the country park boundary related to a Short Term Tenancy granted by LandsD (please refer to Box 4).

UNRESOLVED ISSUE

What changes to the current land use system and regulations are required to lower the number of unauthorized developments, improve the enforcement actions taken, and increase the successful prosecution rate across various existing ordinances?

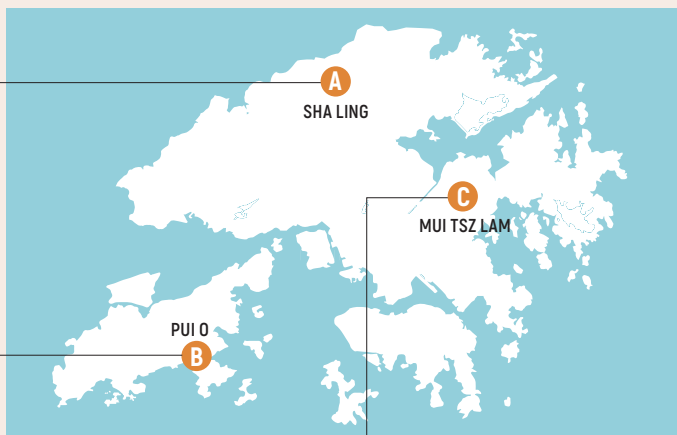
BOX 1

Limitations in the enforcement actions by PlanD, LandsD and EPD

A. Failure in restoring the wetlands in Sha Ling

The conservation value of the wetlands in Sha Ling which has a bird community that is very similar to that of Long Valley was already recognized back in 2010⁶. Sha Ling also forms part of the "Inner Deep Bay and Shenzhen River catchment" Important Bird Area recognized by BirdLife International⁷. The wetland-dependent, conservation-significant and locally range-restricted species Greater Painted-snipe (*Rostratula benghalensis*) used to breed in the area but the species disappeared after extensive land filling occurred in late 2017.

Although RNs were issued in 2018 and the offender was successfully prosecuted, the destroyed land was not restored to a wetland as the landowner was only required to remove the debris above 1.2 metres and grass the land (Figure 2). Environmental NGOs criticized this kind of reinstatement as ineffective especially for restoration of wetlands as the filled materials may not be entirely removed (i.e. the ground level not being low enough to reach the water table to restore the wetland).



B. Uncontrolled land filling at the Pui O wetlands

The ecological and conservation value of Pui O is well-recognized¹¹. The Development Bureau stated that Pui O has "a sizeable chunk of representative lowland freshwater wetlands. Rarely found in Hong Kong, such wetlands serve as both resting and foraging grounds for wildlife"¹². Although Pui O is covered by the South Lantau Coast OZP, planning controls cannot be enforced due to the absence of a DPA plan. As such, it leaves EPD to carry out enforcement actions under the Waste Disposal Ordinance (Cap. 354) for illegal dumping of waste materials on private land. In many cases, however, the consent from the landowner was obtained and EPD was notified before the deposition. In 2015, such acknowledgement from EPD was challenged in court, that the environmental impacts of the deposition should also be considered before issuing the acknowledgement¹³. Yet in 2018 the court finally ruled that EPD do not have such power to do so¹⁴. Therefore, it is expected that the on-going land filling in the private lands of Pui O would continue to worsen, causing more wetland loss (Figure 3).

C. Continuous land filling of fallow agricultural lands in Mui Tsz Lam

Mui Tsz Lam and Mau Ping are encircled by the Ma On Shan Country Park. They had the sixth highest score among the 12 Priority Sites for Enhanced Conservation identified under the New Nature Conservation Policy⁸. Both Mui Tsz Lam and Mau Ping are recognized for their well-established natural native woodlands and *Fung Shui* woods, but the two areas are under different planning control.

Mui Tsz Lam was covered under the Ma On Shan Outline Zoning Plan in 1991, while Mau Ping was covered by Mau Ping DPA in 2011 and subsequently an OZP in 2014 with over 98% of the area covered by CA zone¹⁰. Since 2007, extensive vegetation clearance, land excavation and land filling in Mui Tsz Lam has been continuously reported by environmental NGOs. In 2019, the private fallow agricultural land at Mui Tsz Lam was excavated, re-profiled and filled (Figure 3); however, no enforcement actions could be taken even though it was zoned as GB without prior coverage under a DPA plan. LandsD did not take enforcement actions as the land lease does not have restrictions on such earthworks. Even places of conservation importance are threatened by this loophole in the current planning system.

FIGURE 2



The Sha Ling wetlands with a stream running through in April 2017 before the destruction occurred (top), and the reinstated grassland at the same site in September 2019 (bottom).

FIGURE 3



Due to the loopholes in the existing legislations, more wetlands were filled and fenced off in Pui O for the installation of camping tents on platforms (top); while the agricultural land at Mui Tsz Lam continued to be excavated, re-profiled and filled (bottom).

BOX 2

Unauthorized development related to an approved EIA project

As the land decontamination and advance works of Lok Ma Chau (LMC) Loop commenced, environmental NGOs expressed concern to the Civil Engineering and Development Department (CEDD) in September 2019 as the locations of construction works and the alignment of the fence to protect the wetland at LMC Loop deviated from the plan in the approved EIA (Register No. AEIAR-176/2013).

The wetlands at the LMC Loop were not adequately protected from the construction work (Figure 4) and its ecological connectivity with the meander for the use of the globally near-threatened Eurasian Otter was not maintained. However, CEDD replied the works followed the conditions as stated in the Environmental Permit (EP) and no abnormalities were detected in their bi-weekly monitoring under the EM&A¹⁵. After several rounds of communication, it emerged that the “miscommunication” was caused by the Ecological Mitigation/ Habitat Creation and Management Plan (HCMP), which has been revised and approved by relevant Government

departments but the document was not found on the EIA website when the complaint was made. Environmental NGOs considered that the approved amendments were not “*designed, constructed and operated in accordance with the information and recommendations described in the approved EIA Report*” as stated in the EP¹⁶. A complaint was also made to the Advisory Council on the Environment (ACE) and a member raised the issue in the meeting in November 2019, but CEDD was not in the meeting for communication and only EPD made the report to members¹⁷. This incident revealed several issues with the current EIA system:

1. following the conditions as set in the EP may not require the project proponent to follow the details as written in the approved EIA;
2. after the approval of the EIA, it is highly dependent on the relevant Government departments to monitor and ensure that there are no adverse ecological impacts caused by the amendments to the project details and the proposed HCMP;

3. the monitoring information of approved projects may not be accessible due to the delay in the uploading of documents by the Government or broken links caused by inappropriate website management of the project proponent; and
4. ACE may have limited power to monitor approved projects depending on how the issue was reported by the Government and if the project proponent was present in the meeting for answering enquiries.

This indicates the presence of a rigorous monitoring and review process with opportunities available for the public to scrutinize and participate is important, so as to prevent the occurrence of such incidents again.

FIGURE 4



Some of the advance works at Lok Ma Chau Loop encroached into the wetlands and fenced off areas

BOX 3

"Destroy first, build later"

In 2011, the TPB announced they were determined to deter "destroy first, build later" activities and would not give sympathetic consideration to these applications¹⁹. Environmental NGOs had high hopes in such statement and expected the TPB to reject applications with "destroy first, build later" activities (i.e. ranging from clearing vegetation to sites with UD identified by PlanD). However, not all eco-vandalisms reported by environmental NGOs were regarded as "destroy first, build later" cases by PlanD¹⁹, and not all applications of such cases were rejected by TPB. In some cases, TPB made strong statements

that the approval of applications at damaged sites would "set a very bad precedent" for others and rejected the application²⁰. In one case, members even stated that "the Board should make clear to the public that the Board would not condone the 'destroy first, build later' approach even if the Site was already damaged before the applicant acquired the land. The owner who purchased a piece of land that was 'damaged' should bear the responsibility for remedial action", and that the planning assessment for "destroy first, build later" sites "should be made on the basis of the original,

undamaged condition of the sites"²¹. For cases subject to enforcement action, TPB would "take into account the reinstated condition of the site as required in RN (Reinstatement Notice) issued by the Planning Authority when considering the application"²² (Figure 5).

During the deliberation session, some members expressed difficulties in making a judgment on "whether an application would be a 'destroy first, build later' case, particularly when there was no evidence that the existing vegetation was cleared by the applicant"²³, and "it was not clear whether the Committee could reject an application if the party responsible for the destruction could not be identified"²⁴.

In many cases, "destroy first, build later" was just one of the reasons for rejection in TPB's decision and may not necessary lead to the rejection of the application. It was explained that "for those alleged 'destroy first, build later' cases, it did not, however, imply that all applications previously involving 'destroy first, build later' issue would be rejected"²⁵. Some members consider that if the site has been reinstated, then "destroy first, build later" may not be a relevant consideration²⁶.

FIGURE 5



"Destroy first, build later" case at the fallow wet agricultural land in Sha Ling in 2018.

BOX 4

Short Term Tenancy within country park

In 2018, suspected unauthorized vegetation clearance, slope cutting and erection of structures were observed on government land within Lam Tsuen Country Park at Tai Kong Po (Figure 6). The affected area is related to a Short Term Tenancy (STT) granted by the LandsD²⁷. It is unclear if LandsD sought advice from AFCD or the Country and Marine Parks Board (CMPB) before the STT was granted, or if such consultation is required in the process. If not, the applied use of the STT may not be compatible with the conservation intention of the country park, and thus may threaten the integrity of the country park system. According to Section 16 (1) Control of use of land in country park under the Country Parks Ordinance (Cap. 208), "Notwithstanding any Ordinance or the terms of any lease or agreement for a lease, in any case where the Authority is of the opinion that any use or proposed use of any leased land by the occupier within a country park would substantially reduce

the enjoyment and amenities of the country park as such, he may request the appropriate Land Authority to exercise the powers conferred by this section." The Agriculture, Fisheries and Conservation Department should have the power

to request the other authority (i.e. LandsD) to exercise their enforcement actions as conferred in the above section, especially when the activity at the site would reduce the enjoyment and amenities of the country park.

FIGURE 6



The cut slope and site formation work at Tai Kong Po which was suspected to have intruded into Lam Tsuen Country Park and is related to a STT granted by the LandsD

2

HEADLINE INDICATOR 2: ESTABLISH AND IMPROVE ACCEPTED GLOBAL BEST PRACTICES FOR THE CONSERVATION AND SUSTAINABLE USE OF BIOLOGICAL DIVERSITY IN HONG KONG

2.1 Percentage of taxa on a published Red Data List protected by the law and covered by species action plans

This indicator shows the *state* of threats on individual species, through changes in the number of threatened species listed under the IUCN Red List (i.e. with conservation status of Critically Endangered, Endangered or Vulnerable). It also illustrates the corresponding *response* from the government through the formulation of conservation action plans and provision of legal protection to threatened species.

Changes in the conservation status

The number of threatened species found in Hong Kong and assessed under the International Union for Conservation of Nature's Red List of Threatened Species (IUCN Red List) increased

slightly from 100 species in 2017 to 106 in 2019 (please refer to Appendix 1 of this report), yet, the percentage of threatened species protected by the law remained at around 65%. This is likely because the newly added threatened species were already protected under existing legislation.

In 2017, Yellow-breasted Bunting was up-listed from EN to CR as the overall population decline rate was greater than expected, which is likely to be caused by excessive trapping during migration (Figure 7)³¹. The species has now been up-listed three times within a decade's time from NT to CR. Three other species were also up-listed in 2017, namely Black-legged Kittiwake (from LC to VU), Aleutian Tern (from LC to VU), and Silky Shark (from NT to VU). It should be noted that the principal threats to these species occur outside Hong Kong. Indo-Pacific Humpback Dolphin (which is often referred to Chinese White Dolphin (CWD)) was finally assessed as VU in the IUCN Red List based on an inferred reduction in population size, mainly caused by bycatch, habitat

TABLE 4 Globally threatened species and their conservation in Hong Kong from 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Threatened species listed in IUCN Red List (CR, EN, VU) ^{#*}	76	79	81	84	85	88	95	97	100	103	106
Covered by action plans (including global action plans) or have species-specific conservation actions ^{^*^28,29,30}	9 (12%)	9 (11%)	9 (11%)	10 (12%)	10 (12%)	10 (11%)	13 (14%)	13 (13%)	14 (14%)	14 (14%)	15 (14%)
Threatened Species protected by law (Cap. 96, 170, 586) [*]	49 (64%)	51 (65%)	53 (65%)	54 (64%)	53 (62%)	54 (61%)	61 (64%)	63 (65%)	65 (65%)	67 (65%)	68 (64%)

[#] Abbreviation used: CR – Critically Endangered; EN – Endangered; VU – Vulnerable; NT – Near Threatened; LC – Least Concern.

^{*} Figures were revised from the last report.

[^] Data were combined as it is difficult to differentiate the two categories.

loss and degradation (please also refer to section 3.5 of this report)³². Whereas the Dalmatian Pelican, which used to be a regular winter visitor and has not been seen in Hong Kong since 2010, was down-listed from VU to NT as conservation measures in Europe have resulted in an increase in the population³³.

The globally near threatened Collared Crow was up-listed to VU in 2018, due to moderately rapid population decline likely caused by prey depletion³⁴, although its population in Hong Kong remains stable. Three species were newly added to the EN category – Osbeck's Grenadier Anchovy, Japanese Grenadier Anchovy, and Fairy Orchid. Lack of long-term quantitative data across its range caused the Giant Grouper to be down-listed from VU to Data Deficient³⁵.

In 2019, Rickett's Big-footed Myotis (a bat) was up-listed from NT to VU, due to water pollution problems in China which threatens its food source³⁶. The Tri-spine Horseshoe Crab³⁷ and the Hong Kong endemic Bogadek's Burrowing Lizard³⁸ were newly added to the IUCN Red List with the conservation status of EN.

Action plans and conservation actions for threatened species

The percentage of threatened species in Hong Kong covered by species actions plans (SAP) remains low at around 15%. Under Hong Kong's first BSAP, the AFCD published "Guidelines on the Formulation of Species Action Plan" in early 2018³⁹. A SAP for Incense Trees was also published in the same year⁴⁰, though some conservation actions were already in place to conserve the species; while a SAP of for the critically endangered⁴¹ Chinese Pangolin was published in late 2019⁴². SAPs for other priority species, such as Big-headed Turtle, Finless Porpoise, horseshoe crab and corals are still under formulation. The global action plan for Yellow-breasted Bunting is still under development by BirdLife International Asia as further consensus is needed and some knowledge gaps remain⁴³.

The SAP of CWD was published back in 2000⁴⁴. Even so, the existing SAP appears unlikely to reverse its drastic declining trend over the past decade (please refer to section 3.5 of this report). Under the BSAP, the CWD SAP is targeted to be updated by 2020, but AFCD is still collecting more acoustic data of CWD through Passive Acoustic Monitoring to study their temporal trends. In May 2020, environmental NGOs from Hong Kong and Guangdong jointly produced the "Emergency Action Plan for the Pearl River Delta Population of the Chinese White Dolphin" with CWD's core and buffer areas mapped, urging the Hong Kong government to seize this last chance and commit to the proposed conservation actions in order to save this unique species from disappearing⁴⁵.

FIGURE 7



Yellow-breasted Bunting was uplisted to Critically Endangered in 2017 as the overall rate of population decline over three generations (11 years) was greater than previously estimated. Trapping in its passage and non-breeding ranges were thought to be the primary cause for the drastic drop in numbers.

More research and studies were conducted for Three-banded Box Turtle and Black-faced Spoonbill, which both have existing SAPs. The SAPs for Romer's Tree Frog and Green Turtle are currently under review and are expected to be finalized by the end of 2020. In order to enhance the protection of Green Turtle, AFCD is preparing to expand the Sham Wan Restricted Area listed under the Wild Animal Protection Ordinance (Cap. 170).

Hong Kong Red List of Threatened Species

One major achievement under the BSAP is the formulation of the Hong Kong Red List of Threatened Species. Slightly different from the global IUCN Red List, a local Red List can reflect the importance of that species and the threats it faces at a local and regional scale, and thus better inform and persuade relevant stakeholders to protect threatened species and their habitats. Assessment has commenced for species with readily available data while others are still in the preparatory stage. While assessments for amphibians and reptiles, bats, waterbirds and marine mammals will be finalized soon, more time is required (no schedule has been set) before a comprehensive Red List can be published. This will hopefully tie in with the assessment or enforcement under the current ordinances (e.g. Environmental Impact Assessment Ordinance (Cap. 499) (EIAO)) and hence help to enhance the protection of threatened species and their habitat.

UNRESOLVED ISSUE

What is the timetable for a comprehensive Hong Kong Red List of Threatened Species to be published, with existing legislation and species action plans updated and developed accordingly?

3

HEADLINE INDICATOR 3: REVERSING THE DECLINE IN NATIVE BIODIVERSITY

3.1 Percentage of protected areas covered by published, resourced and active biodiversity management plans

This indicator points out the *response* of the government to the protection of terrestrial and marine areas of conservation concern, and monitors the progress towards active management of these sites which aims improve the *state* of biodiversity at species, community or habitat levels.

Designation and management of Country Parks

The coverage of protected areas remained unchanged from 2017 to 2019. There has been no progress in the inclusion of more Country Park enclaves⁵³ into the Country Park system. In 2020, there were still 19 enclaves with a total area of about 186 hectares still waiting to be protected by the Country Park Ordinance (Cap. 208)[please refer to Appendix 2]. The Agriculture, Fisheries and Conservation Department has stated that priority would be given to the 7-hectare enclave at Yi Tung

TABLE 5 Terrestrial Protected Areas (hectares) in Hong Kong from 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total land area of Hong Kong	110,439	110,439	110,441	110,443	110,443	110,562	110,569	110,634	110,642	110,666	110,666
Protected area network (Country Parks and Special Areas) ⁴⁷	44,004 (39.8%)	44,004 (39.8%)	44,239 (40.1%)	44,239 (40.1%)	44,300 (40.1%)	44,300 (40.1%)	44,300 (40.1%)	44,300 (40.0%)	44,312 (40.0%)	44,312 (40.0%)	44,312 (40.0%)
Area of Country Parks and Special Area covered by biodiversity management plans ^{*48,49,50}	110 (0.2%)	110 (0.2%)	110 (0.2%)	110 (0.2%)	110 (0.2%)	110 (0.2%)	110 (0.2%)	110 (0.2%)	150 (0.3%)	150 (0.3%)	150 (0.3%)
Area not in protected area system, but covered by biodiversity management plans ^{51,52}	1,799 (1.6%)	1,804 (1.6%)	1,806 (1.6%)	2,144 (1.9%)	2,161 (2.0%)	2,118 (1.9%)	2,180 (2.0%)	2,148 (1.9%)	2,131 (1.9%)	2,147 (1.9%)	2,137 (1.9%)

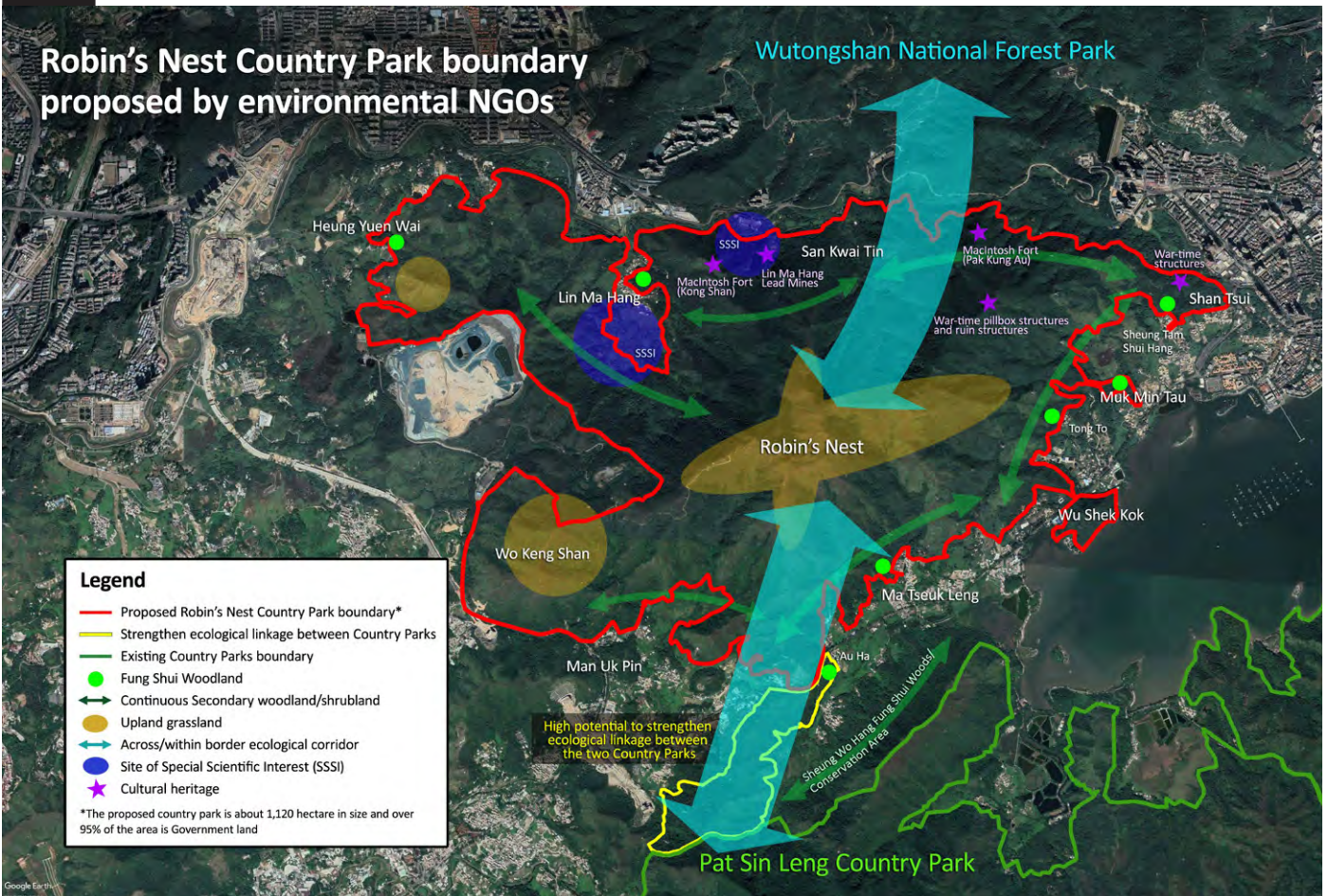
* Even though Country Parks and Special Areas are managed by AFCD, only the Hong Kong Wetland Park Special Area has biodiversity management plan and is accessible to the public.

Shan on Lantau Island⁵⁴. There was also an on-going delay on the designation of Robin's Nest Country Park (RNCP). The Robin's Nest area is an important ecological corridor connecting Hong Kong's Country Park network and the Shenzhen Wutongshan National Forest Park. Its conservation value is well-recognized as its potential for a Country Park was identified in the Territorial Development Strategy Review by the Planning Department back in 1993. Finally, the Government announced in 2017 Policy Address that about 500 hectares of the Robin's Nest area will be designated as a Country Park⁵⁵, but the boundary failed to establish the intended ecological corridor. Relevant stakeholder engagement exercises were conducted in 2018 and 2019. In May 2019, six environmental NGOs criticized that large areas of high ecological, historical, cultural, and landscape value were excluded from the proposed RNCP boundary, and the delineation was not in line with the "2011 Principles and Criteria for Designating Country Parks"⁵⁶. They instead proposed extending the RNCP boundary to an area of about 1,120 hectare (Figure 8). Taking into account all stakeholders' comments and other relevant considerations, AFCD suggested minimizing the buffer area

between the proposed RNCP and permitted burial grounds/private lands⁵⁷ which have often been a source of hill fires; while members of the Country Parks Committee and Country and Marine Parks Board (CMPB) generally agreed that AFCD proceed with the designation of RNCP of about 500 hectares and then investigate ways to protect other areas of conservation concern⁵⁸.

The increase in area of Country Parks covered by biodiversity management plans (from 0.2% to 0.3%) was due to the increase in the area under the Plantation Enrichment Programme (PEP). Since 2016, AFCD invited NGOs to participate in PEP which at the end of 2020 covered about 27 hectares of plantations for biodiversity enhancement⁵⁹. However, despite the fact that the Country Parks were established with an intention for nature conservation⁶⁰, there are currently no management plans for conservation in the Country Parks. The absence of management plans for the protected areas has reduced the accountability of the management authority and do not favor improvement of the current management works.

FIGURE 8



Six environmental NGOs counter-proposed a new RNCP boundary following the "2011 Principles and Criteria for Designating Country Parks" and the Government's intention to establish an ecological corridor. The NGO's proposed RNCP is about 1,120 hectare in size, with over 95% of the area in Government land.

Management plans of other terrestrial areas

The slight fluctuation in the total areas covered by management plans is a result of the variation of the number of participants under different Management Agreement (MA) projects in Deep Bay and Long Valley. Two new MA projects in Sai Wan and Sha Lo Tung were commenced in 2017 and 2018 respectively, with funding from the Government's Environment and Conservation Fund. The rehabilitation project for Sai Wan area was proposed by Sai Kung District Community Centre Limited *"to rehabilitate abandoned agricultural land for wildlife use"*⁶¹.

In 2017, the Government agreed in principle to grant a piece of land at the Shuen Wan Restored Landfill in Tai Po in exchange for the long-term protection of the private lands with high ecological importance at Sha Lo Tung (i.e. non-in-situ land exchange)⁶². Subsequently, an 18-hole golf course was proposed at Shuen

Wan Restored Landfill and there were concerns on significant loss of night roost habitat for the globally vulnerable Collared Crow, but the corresponding Environmental Impact Assessment was eventually approved in July 2019⁶³. While the land exchange process is still underway, environmental NGO Green Power has already started to restore and maintain various habitats including marshes, abandoned farmlands and irrigation systems to enhance the biodiversity at Sha Lo Tung under the MA scheme since 2018 (Figure 9)⁶⁴. Until the land premium and other issues are settled between the landowner and the Government, it is still uncertain if the long-term conservation of Sha Lo Tung can be secured through non-in-situ land exchange. Furthermore, the development threats in Sha Lo Tung are not yet fully eliminated as the building lots in the Village Type Development zone are not included in the land resumption, and thus the possibility for small house development in the area remains.

FIGURE 9



Green Power successfully reconstructed the wetlands at Sha Lo Tung by retracing the historic irrigation facilities and replicating the old stream water irrigation system. These seasonal wetlands would facilitate the recolonization of native wetland plants and provide suitable habitats for dragonflies and amphibians, thus restoring the loss in ecological function caused by human disturbance and habitat abandonment over the past decades in Sha Lo Tung.

TABLE 6 Marine Protected Areas (hectares) in Hong Kong from 2009 to 2019

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total marine area of Hong Kong ⁶⁵	165,064	165,064	165,062	165,060	165,060	164,941	164,934	164,869	164,861	164,837	164,837
Area of Marine Parks and Reserves ⁶⁶	2,430 (1.5%)	2,430 (1.5%)	2,430 (1.5%)	2,430 (1.5%)	2,430 (1.5%)	2,430 (1.5%)	2,430 (1.5%)	3,400 (2.1%)	3,400 (2.1%)	3,400 (2.1%)	3,400 (2.1%)
Area of Marine Parks and Reserves covered by biodiversity management plans ⁶⁷	None*										

* There are management plans for all the Marine Parks and are publicly available on AFCD website. However, they are to restrict the activities within the area. It is uncertain how the biodiversity and habitats in the area are actively managed.

Designation and management of Marine Parks

Though the numbers cannot be reflected in the current reporting period (2017-2019), the new Southwest Lantau Marine Park covering two portions of sea area of about 650 hectares in total was designated in April 2020⁶⁸. This marine park aims to better protect the CWD and their habitats. Besides the on-going disturbance from reclamation projects in North Lantau waters, the potential threats and disturbance to CWD and finless porpoises in South Lantau waters are increasing (please refer to section 3.5). However, despite the fact that the CBD has a global target of at least 10 per cent of coastal and marine areas protected and conserved by 2020⁶⁹, the Hong Kong Government did not set any specific targets for the protection of the marine environment through marine parks and reserves system.

A major achievement in the management of marine parks was the implementation of the new Fisheries Management Strategy in 2019⁷⁰, which means commercial fishing will be banned in Hoi Ha Wan Marine Park, Yan Chau Tong Marine Park, Tung Ping Chau Marine Park, and the Sha Chau and Lung Kwu Chau Marine Park. The coral communities and fisheries resources in these marine parks can be better protected from fishing activities

and the marine ecosystems can be further recovered. However, commercial fishing can still be conducted in The Brothers Marine Park, the Southwest Lantau Marine Park and the new marine parks by application through the marine park fishing permit system⁷¹. Authorized fishing vessels and their associated activities may constitute another source of undesirable disturbance to the marine habitats for CWD and finless porpoise within the marine protected area.

UNRESOLVED ISSUE

When will there be a target and timetable for including terrestrial and marine areas of conservation importance into the protected area system?

What is the timeframe for a publishing and resourcing active biodiversity management plans for all terrestrial and marine protected areas?

3.2 Total area impacted by planning proposals that involves conservation and agricultural zonings

This indicator demonstrates the extent to which development can override biodiversity concerns, by measuring the *pressure* of development encroachment into areas of conservation concern and identifying the corresponding policy and planning threats where possible.

No obvious trend was observed for the total area of planning applications within "Agriculture" (AGR) and conservation zonings (i.e. SSSI, CPA, CA and GB) received by TPB. The fluctuation in the area was mainly due to the applications of Nam Sang Wai residential development, which involved about 56.8 hectares of land within an SSSI and accounted for about half of the total area of applications received. If the Nam Sang Wai development is excluded, the total area of planning applications received fluctuated at 43 hectares from 2017 to 2019.

TABLE 7 Area (hectares) of planning applications received by Town Planning Board from 2013 to 2019*

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
SSSI	0	0	0.1	56.8	56.8	56.8	0	56.8	57.1	0	0.8
CPA	0.4	0.6	7.8	5.1	2.9	1.8	4.6	1.0	3.4	1.9	4.3
CA	5.7	0.2	22.6	1.4	1.1	6.5	0.6	0.7	2.1	0.2	2.8
GB	20.1	12.1	8.5	17.5	16.4	12.1	3.6	14.5	17.6	9.5	8.0
AGR	16.4	38.5	36.3	21.0	20.6	24.1	43.5	14.1	17.8	26.6	34.1
Total	42.5	51.4	75.2	101.8	97.7	101.3	52.2	87.1	98.0	38.3	49.9

TABLE 8 Area (hectares) of planning applications approved by Town Planning Board from 2013 to 2019*

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
SSSI	0	0	0.1	0	0.0	0.0	0.0	0.0	0.3	0.0	0.8
CPA	0.7	0.6	1.2	2.9	0.6	1.8	4.6	1.0	2.0	0.6	3.9
CA	1.4	0.2	0.5	0.7	0.2	6.2	0.6	0.7	0.3	0.2	2.7
GB	11.2	10.8	3.7	10.2	12.3	6.9	1.7	6.4	6.9	4.5	4.4
AGR	13.2	11.1	13.6	11.6	10.4	10.3	8.0	8.1	8.3	15.9	13.4
Total	26.5	22.7	19.1	25.4	23.6	25.2	14.9	16.2	17.7	23.6	25.2

* 2009-2010 were obtained from PlanD through application for access to information. Data from 2011 and onwards were collected from TPB Portal, TPB minutes and TPB papers.

Approved applications in SSSI, CA and CPA

The approved cases within SSSI and CA were mainly related to habitat management in Sha Lo Tung, and facilities repair or upgrade at Mai Po Nature Reserve and The Swire Institute of Marine Science at Cape D'Aguilar. The approved applications in CPA were mainly the public sewer installation in Pui O, and hobby farms and fishing grounds in Lau Fau Shan and Pak Nai.

Approved applications in AGR and GB

The majority of approved applications were in AGR and GB zones, with an average approval rate of 55% and 45% respectively from 2017 to 2019.

Among the 108 approved applications in GB from 2017 to 2019 (Figure 10), nearly 40% related to small house development. In terms of area, however, over half of total GB area were used for recreational purposes, including Pillar Point Valley shooting range in Tuen Mun, hobby farms in Tai Lam and barbecue spots in Lau Fau Shan; while almost a quarter was used for columbarium and public utility installations.

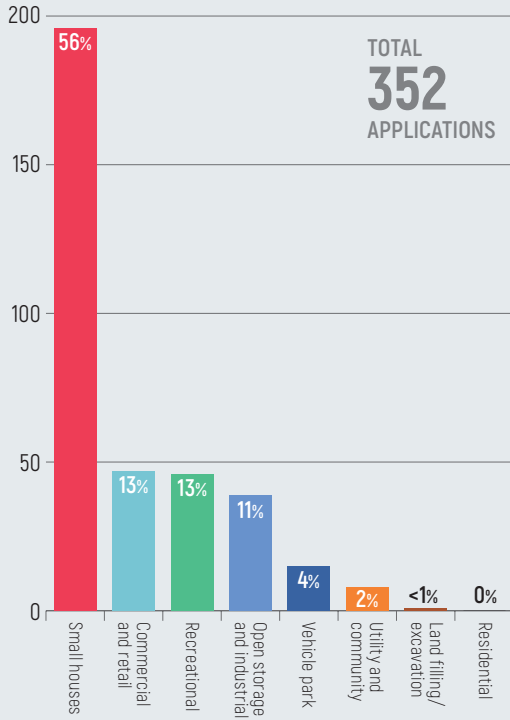
About 10% of GB land was used for vehicle parking with the largest sites in San Tin, Lau Fau Shan and Ping Shan. Overall, most of the approved applications were associated with developments which were not in line with the planning intention of GB, which is to act as a buffer to separate urban areas from rural areas and countryside by natural features and to provide passive recreational outlets.

FIGURE 10

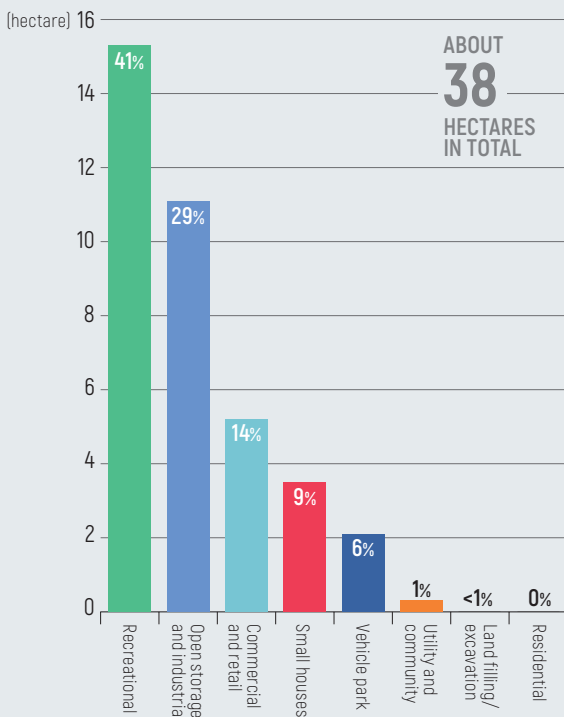
Number of cases and area of different land use types of approved planning applications in AGR and GB from 2017 to 2019

AGR

Number of approved applications in AGR and their proposed land uses from 2017 to 2019

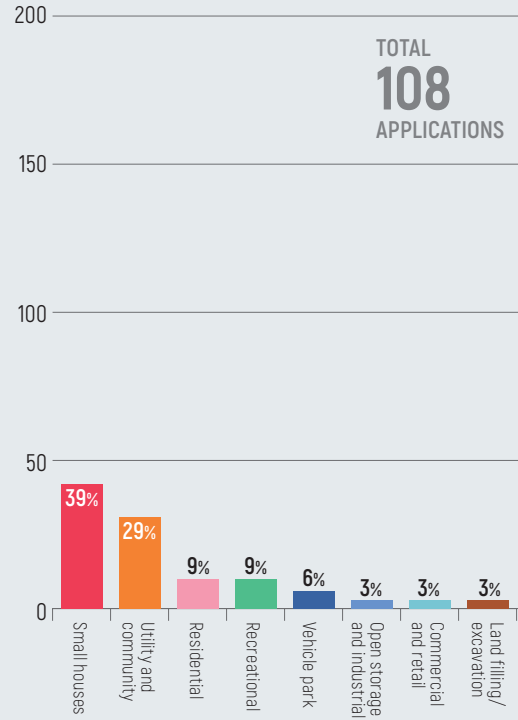


Area of approved applications in AGR and their proposed land uses from 2017 to 2019

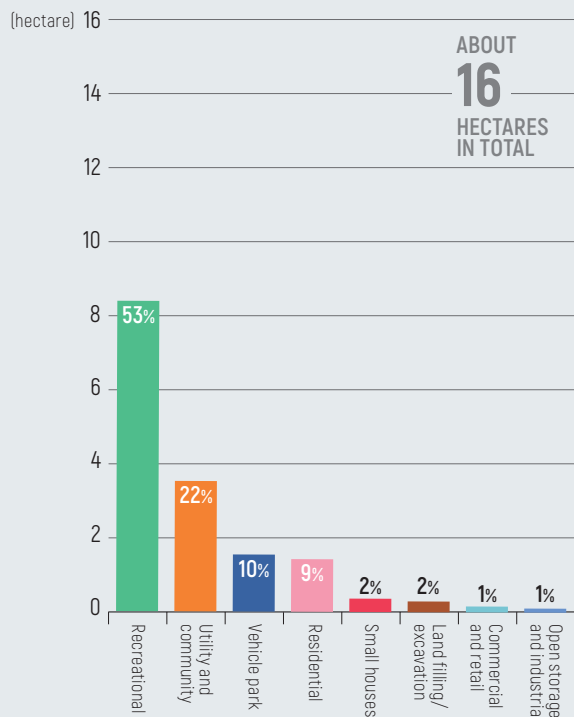


GB

Number of the approved applications within GB and their proposed land uses from 2017 to 2019



Area of the approved applications within GB and their proposed land uses from 2017 to 2019



The number of approved applications in AGR was more than three times higher than that in GB, with a total number of 352 approved applications from 2017 to 2019 (Figure 10). Most of the applications were land uses that are irrelevant or even harmful to agricultural development, such as brownfield, recreation-oriented hobby farm and small house development. Even though 56% of approved applications were used for small house development, it only accounts for 9% of the total AGR land involved. Meanwhile, about 41% of the total area of the approved applications with AGR was used for recreational developments, such as hobby farms with a lot of recreational facilities in Kam Tin and barbecue sites in Ting Kok (please refer to Box 5).

Even though commercial and retail uses only constitute 14% of the total area of approved applications in AGR (5.32 hectares), two-thirds of this is related to temporary animal boarding establishments of which have seen a significant rise in recent years within the AGR zone (please refer to Box 6). These recreational and commercial uses usually require some open space, temporary shelters and some paved land, which are destructive to the arable land yet still seem to be regarded as “compatible” with AGR zone on a temporary basis by the TPB. Furthermore, 29% of the AGR land involved was related to open storage uses in Pat Heung and Sha Tau Kok. All these land uses deviate from the planning intention of AGR, which is to “*retain and safeguard good quality agricultural land/farm/fish ponds for agricultural purposes*”.

Comparing this set of data with that covered in our last reporting period (2014 - 2016), the number of approved applications of small house development in GB and AGR generally dropped, but almost half of the total area of the approved applications in

GB and AGR were related to recreational uses. The nature of these recreational uses maybe somewhat related to natural features in the area or agriculture. However, how such uses can facilitate the planning intentions of GB and AGR remains questionable, as a considerable amount of site formation and built-up area are required to establish these uses. There is also a significant increase in applications to TPB for solar energy system installations in AGR and GB zones (please refer to Box 11 in section 4.2).

Moreover, under the Government’s land policy in recent years, GB and AGR have continued to face imminent development pressure as the shortage in housing supply is considered by the Government to be related to the shortage of land supply (please refer to Box 7). The Government continues to try to rezone well-vegetated or well-wooded GB lands for development through the TPB system, although several of these have faced legal challenges via the judicial review process⁷².

UNRESOLVED ISSUE

What is the timetable for PlanD and AFCD to secure and protect quality farmland for cultivation and prevent trashing of farmland?

What changes in the planning system are needed to prevent the misuse not limited to AGR and GB but also CA and CPA for trashing and undesirable developments?

BOX 5

Leisure/Hobby farms

Leisure farms are defined as “farms that are primarily engaged in commercial crop production while at the same time provide limited and ancillary leisure activities related to their operation” under the New Agriculture Policy⁷³. However, without proper planning control and regulations, much arable land has been trashed after the introduction of hobby farming, which always involves site formation for parking space, vehicle access, barbecue site and temporary structures but limited extent for soil cultivation.

An increasing number of planning applications for hobby/leisure farms have been submitted

to the TPB in the past six years. The number of the applications for hobby farm from 2017 to 2019 was 46, which is nearly double that for the previous reporting period (2014 - 2016). Among the 46 applications, only five were rejected by the TPB. In other words, the approval rate was high reaching 90%. The approved applications involved in about 16 hectares of land within conservation zonings and AGR zone, in which 74% and 24% were AGR and GB zonings respectively.

Nearly 70% of the hobby farm applications followed the “destroy first, apply later” approach as the sites were formed or trashed before applying for

TPB’s permission (Figure 11). Enforcement notices were issued by PlanD for these unauthorized activities, which were mainly land/pond filling and open storage. However, nearly 90% of these applications with unauthorized developments were approved by TPB.

The loose planning control on the recreation-intensive hobby farm development within conservation zonings and AGR zone and a lack of proper regulations to protect agricultural lands against eco-vandalism continue to facilitate the misuse of land and lead to a loss in habitats.

FIGURE 11



A piece of wetland in Pui O was fenced off and filled in 2018, then the land owner applied for permission to develop a caravan holiday camp and tent camping ground (planning application no. A/SLC/161) in 2020. TPB rejected the application as 1) it was not in line with the planning intention of the “Coastal Protection Area” zone; 2) the adverse ecological, water quality, and sewerage impacts on the surrounding areas were not adequately addressed; and 3) it would set an undesirable precedent for similar applications in the area⁷⁴.

BOX 6

Animal Boarding Establishment

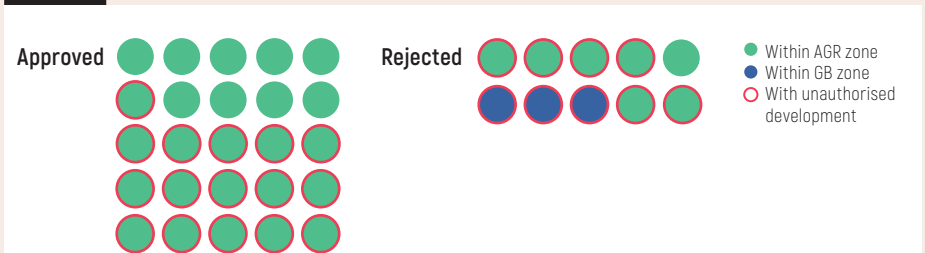
An animal boarding establishment is defined by AFCD as facilities/services that “provide food and accommodation for animals in return for a fee paid by the owner”⁷⁵. Any person providing these services must possess a Boarding Establishment Licence. The number of applications through the TPB for an animal boarding establishment within AGR and conservation zonings has increased significantly in recent years, from five or less applications each year for 2017 and before, to around 15 applications per year in 2018 and 2019. During 2017 – 2019, there were a total of 35 animal boarding establishment-related planning applications within AGR and conservation zonings (Figure 12). Ninety per cent of the applications were in AGR zones and the remaining applications were within GB zones. The overall approval rate is over 70%, and all approved applications were within AGR zone. Over 70% of the applications were associated with unauthorized development and were suspected to follow the “destroy first, apply later” approach

as vegetation clearance, land filling, parking or storage uses occurred at the site.

Similar to hobby farms, animal boarding establishments usually require a certain area of open space, some temporary shelters and some paved land, which are destructive to the arable land and natural features within AGR and

conservation zonings. They also have potential water pollution impacts on the surrounding environments due to the sewerage generated from the animals. It is crucial that AFCD, PlanD and TPB establish relevant guidelines and tighten the planning controls to avoid the misuse of the planning system for trashing of natural features and agricultural land.

FIGURE 12



The number applications approved or rejected by the TPB among the 35 applications for animal boarding establishment within AGR and GB zone from 2017 to 2019, and if any unauthorized development were identified at the site.

BOX 7

Government's policy in development of Green Belt areas and agricultural land

Since the Government announced its intention to develop "devegetated, deserted and formed" GB zones in 2011⁷⁶ and expanded to those GB zones of "insignificant buffering effect and relatively low conservation value" in 2013⁷⁷, many pieces of GB zones have been converted to housing sites via the planning system such as the rezoning process under the TPO. However, many well-wooded sites with significant buffering and conservation value were also selected for housing development (Figure 13). According to the Secretary for Development, a total of about 318 hectares of GB land was rezoned to other uses, including 33 sites of about 73 hectares identified in the two stages of GB review, from 2013 to 2017⁷⁸. During the public engagement of

Land Supply in 2018, taking GB zone for housing development is regarded as a "current land supply strategy and ongoing initiatives"⁷⁹. All the above suggests the Government seems to downplay the importance and functions of well-vegetated GB land and its role as a buffer in a city.

AGR land is the only zoning that is intended to conserve good quality agricultural land and fish ponds for agricultural purposes, yet it faces much higher development pressure than conservation zonings such as GB, CPA and CA zones. Even though "Agricultural Priority Areas" were proposed in the "New Agriculture Policy" back in 2016 in order to secure land for long-term

agriculture use, it was not until 2019 that the consultancy study for the identification of quality agricultural land was finally underway, but still its tentative completion date is unknown. In the meantime, various strategies to release the development potential of agriculture land were announced.

In 2017, the Government assigned the Task Force on Land Supply to look for measures to increase in land supply and to facilitate consensus-building in society on various land supply options. In the consultation report published in 2018, "unleashing development potential of private agricultural land in the New Territories", using the mechanism of public-private partnership (PPP) was regarded as one of the top three priority options to boost land supply in the short- to medium-term. This option was further implemented by the Government under the "Land Sharing Pilot Scheme" as announced in the Policy Address of 2018 so as to facilitate housing development, and it was opened for application from May 2020 for a period of three years. However, without defining and implementing the "Agricultural Priority Areas" first, the "Land Sharing Pilot Scheme" would likely provide incentives and policy backup to justify non-agricultural uses within AGR zone, or even the rezoning of AGR zone to development zonings, thus setting an undesirable precedent for developers and landowners to destroy farmlands in hope of favouring future development.

FIGURE 13



The site at the east of Hong Kong Movie City, which was assessed as secondary woodland of "Moderate to High" value and is ecologically connected to surrounding woodland and watercourse⁸⁵, but was rezoned for housing development. The site is clearly still performing the functions of a GB zone and the rezoning is inconsistent with the Government's GB review criteria.

3.3 Percentage of lowland rivers (below 200m above sea level) that a) remain in natural state and b) are impacted by channelization

This indicator demonstrates the state of natural lowland rivers and illustrates its development pressure caused by river channelization. It can also indirectly reflect the length of engineered channels restored back into their natural state, if any.

The information on length of natural streams is not available, however length of engineered channel is monitored by the Drainage Services Department (DSD). Since 2016, the length of engineered channels leveled off at 363 km for four consecutive years. However, there is an upcoming project, with its EIA Study Brief approved in 2019, to alleviate the flooding problem in the Ping Che and Ta Kwu Ling area which includes river widening, river deepening and construction of drainage channels of about 3.3 km long at some tributary sections of River Ganges (Ping Yuen River)⁸⁷.

TABLE 9 Length (km) of engineered river channels in Hong Kong from 2006 to 2019

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Length of engineered channels ^{86*}	184	199	243	258	278	N/A	338	341	354	361	363	363	363	363

Source: Drainage Services Department

Nullah revitalization

After years of stakeholder engagement, planning and construction, the reconstruction and rehabilitation of the upstream and midstream sections of Kai Tak River were completed in 2019. Besides greatly improving the drainage capacity of the river, DSD also added various greening and ecological elements in the engineered channel, such as artificial rock planters, submerged planters, flow deflectors and fish shelters, so as to beautify the environment and improve the river's capacity for wildlife usage, thus transforming the nullah into an urban green river corridor.

However, the *E. coli* levels (i.e. a faecal indicator for water monitoring) of most of the river quality monitoring stations along the Kai Tak Nullah are still "High" (10,001 - 100,000 counts per 100 mL) or "Very High" ($\geq 100,001$ counts per 100 mL). Thus, there is limited potential for promoting water-friendly facilities or activities at Kai Tak Nullah unless there is reduction in the *E. coli* level as the water would cause potential health risk to users. Other urban river revitalization projects include Tsui Ping River, which involved the local community and green groups in the planning and design stage. River channels with revitalization potential, such as Tai Wai and Fo Tan Nullahs (Figure 14), were identified and proceed for further feasibility investigations.

FIGURE 14



The Fo Tan Nullah connects to a natural stream with well-vegetated riparian zones. A variety of wildlife including birds, butterflies, dragonflies and freshwater fish were seen in the natural stream and its immediate downstream channelized section. Therefore, the upper Fo Tan Nullah is considered to have a high potential for ecological enhancement.

FIGURE 15



WSD commissioned a consultancy study on the baseline ecology of irrigation reservoirs. It aimed to study the biodiversity and habitats of seven irrigation reservoirs in Hong Kong, including Tsing Tam Upper Irrigation Reservoir (above), and to explore feasible measures to enhance their biodiversity.

Biodiversity enhancement in rivers and catchwaters

Since the publication of a new set of guidelines on environmental and ecological considerations for river channel design (DSD Practice Note No. 1/2015) in 2015⁸⁸, DSD has continued to conduct various research and development studies on techniques to promote ecosystem services and biodiversity in streams, rivers and water bodies. The Department is also reviewing the guidelines according to the findings from the studies. The "EcoDMS" website was launched in 2018 to introduce the river channel projects by DSD and to promote public awareness of rivers and streams in Hong Kong, compiling wildlife information and water quality data at the selected sections of river channels⁸⁹.

Apart from promoting biodiversity in drainage facilities, ecologically friendly designs were adopted in water services facilities. The Water Services Department, in consultation with AFCD, installed animal escape routes and use of ecological friendly materials in catchwaters, and further formulated such designs for territory-wide application on need basis. Moreover, WSD continues to investigate the revitalization of downstream habitats of catchwater in Lantau and the ecological enhancement at irrigation reservoirs (Figure 15).

The Tung Chung River Park is an important nature conservation element in the Tung Chung Valley development, and CEDD is now finalizing its detailed design. The River Park, together with the flood prevention polders, sustainable drainage system and the use of conservation zoning as a buffer to avoid adverse development, are expected to help conserve the ecologically sensitive Tung Chung River and its estuary. Close monitoring and communication with the Government is needed to ensure the proposed sustainable and conservation features (e.g. polders, attenuation and treatment ponds) are properly implemented.

Another side of the issue: river water quality

The Environmental Protection Department has been monitoring the river water quality in Hong Kong since 1986⁹⁰. The monitoring programme expanded from 47 monitoring stations in 14 watercourses in 1986 to 82 stations in 30 watercourses since 1997. The water quality of rivers in Hong Kong has improved significantly in the past three decades. Comparing the Water Quality Index calculated based on dissolved oxygen, five-day biochemical demand and ammonia-nitrogen content across the years, only 26% of the river monitoring stations were graded "Good" or "Excellent" back in 1987, but since 2005 there were on average 84% of the stations which met such criteria and it has remained in this condition for the past 10 years without any further significant improvements.

E. coli is one of the biological parameters measured in the river water which indicates the degree of faecal pollution from warm-blooded animals and infers the presence of disease-causing microorganisms. Even though water quality at most of the river monitoring stations has improved over the past decades, still one-third of the stations are still graded "High" (10,001 – 100,000 counts per 100 mL) or "Very High" ($\geq 100,001$ counts per 100 mL) for *E. coli* levels, especially those located in the western part of New Territories (e.g. Yuen Long Creek, Kam Tin River).

The main causes for *E. coli* pollution were discharges and runoff from livestock farms, unsewered villages (please refer to Box 8) and some old districts⁹¹. However, these watercourses and rivers are primarily intended for directing stormwater and flood prevention instead of sewerage discharge or treatment. Interdepartmental collaboration (e.g. EPD and DSD) is important to strengthen enforcement of pollution control legislation and to provide public sewers to unsewered areas. Under the current BSAP, a preliminary action plan for providing sewerage facilities in unsewered areas in the catchment of Yuen Long Creek and Kam Tin River was prepared by EPD in consultation with DSD.

UNRESOLVED ISSUE

Natural rivers should be protected and the amount of engineered channels should be minimized in new development areas.

Interdepartmental effort is required to improve the water quality of rivers and channels in Hong Kong and to enhance their biodiversity.

BOX 8

Problem of septic tanks and soakaway systems (STS)

The sewerage generated in many urban or new town areas are already served by sewerage treatment facilities in the district. However, many villages in rural areas or squatter areas still rely on STS for sewerage treatment or even direct discharge into a nearby river or drainage system, polluting the water bodies in the locality. The Drainage Services Department has already recognized the environmental and hygiene problem of STS⁹², which is particularly serious in areas with densely populated village houses, where the sewerage generated exceeds the natural treatment capacity of the soil in the area and when there is lack of regular maintenance of the STS leading to sewerage overflow. The Guidance Notes on Discharges from Village Houses published by EPD⁹³ states that an STS "can only perform well if it has been properly sited, designed, constructed, used, desludged and repaired when necessary...overflow from septic tank or soakaway pit, or direct discharge without passing through a soakaway system, is polluting and should not be permitted".

In 2016, the Director of Audit investigated the sewerage systems in rural areas and found some STSs were not in line with the practice note issued by EPD in 1993 (ProPECC PN5/93), as the requirements of STSs between different Government departments were inconsistent⁹⁴. In many TPB-approved small house applications, the applicant is only required to provide a septic tank for the proposed development at a location to the satisfaction of the Director of Lands or of the TPB⁹⁵ neither of which has the technical expertise to properly adjudicate whether the STS meets the requirements for safe and effective operation. Under such practices, it is likely that the STSs installed in villages with a high water table (e.g. near streams or wetlands) or with a dense population may have already caused water pollution, leading to degradation of water quality and ecology in the nearby waterbodies (Figure 16).

The 2016 Audit Report also revealed that in the village houses provided with public sewers⁹⁶, about 31% had not actually been connected to the public sewer due to village houses not being ready for connection, technical problems

FIGURE 16



Improper installation and maintenance of the septic tank and soakaway system would lead to the overflow of untreated sewerage, causing water pollution problem in the area.

or because the house owner did not take action. In some cases, connection had still not been completed 10 to 15 years after the public sewerage works in the locality was already completed. As of June 2016, the average sewer-connection rate of small houses was only 37%. Interdepartmental effort is required to ensure village houses are connected to the public sewer within a reasonable time after the completion of the public sewerage works. Regular monitoring and inspection of the connection progress of villages is also required.

3.4 Trends in number and populations of known invasive alien species

This indicator shows the *pressure* on biodiversity caused by invasive alien species (IAS), as well as the *response* measures taken to control the spread of these species. Three alien species covering plants and animals in terrestrial and freshwater environments (i.e. House Crow, Apple Snail and Mikania) were selected to provide a general overview of the current status of IAS in Hong Kong.

FIGURE 17



Eggs of Apple Snail in a field of water spinach. Apple Snail is known to feed on wet agricultural crops and natural vegetation and out-competes native freshwater snail species

TABLE 10 Trends in number and populations of known invasive alien species from 2007 to 2019

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
House Crow <i>Corvus splendens</i> ^{97,98}	210	220	250	190	230	182	130	80	71	71	71	93	104
Apple Snail <i>Pomacea canaliculata</i> removed (kg) ⁹⁹	-	-	-	-	-	-	63	13	142	155	111	125	155
Area of Mikania <i>Mikania micrantha</i> removed (ha) ^{100,101,102}	2.6	3.3	4.4	2.4	10.9	6.7	2.6	8.0	6.4	6.2	6.4	22.9	24.5

Source: AFCD, WWF – Hong Kong, Environmental Association, Policy for Sustainability Lab and School of Biological Sciences of HKU, The Conservancy Association, and Green Power

The House Crow, native to India and Sri Lanka, is considered to be an alien invasive species causing ecological damage (especially to native birds) and nuisance to humans in almost all the countries where it occurs outside its native range. *Mikania micrantha* is a fast-growing weed native to South and Central America that smothers other plants and reduces sunlight for photosynthesis. Apple Snails originated from South America are a threat to wet agricultural crops, natural vegetation, and native freshwater snail species (Figure 17). Different Government departments are responsible for maintenance of vegetation (such as clearing of Mikania) on Government lands which are under their jurisdiction¹⁰³. However, there is no comprehensive survey of Mikania or Apple Snails in Hong Kong.

Efforts to control the IAS population

The population of House Crows increased slightly from 71 in 2017 to 104 in 2019, yet the population remained lower than that of over 200 individuals 10 years ago. It is important for the AFCD to keep up with its proactive effort and success in controlling and monitoring of this species to suppress its population. Given the explosion of alien invasive House Crow populations in other cities they have colonized, maintaining the population at this low level is a notable achievement for AFCD.

The amount of Apple Snail and Mikania removed from managed wetlands continues to rise. This is likely due to the increase in the area with MA schemes for which there is on-going monitoring and control of IAS. Mai Po Nature Reserve is managed by WWF – Hong Kong¹⁰⁴, Fung Yuen Butterfly Reserve by Environmental Association¹⁰⁵, Hong Kong Wetland Park by AFCD¹⁰⁶, Lai Chi Wo by the Conservancy Association (since late 2017)¹⁰⁷, and Sha Lo Tung by Green Power (since 2018)¹⁰⁸. The amount of Apple Snails removed from the Mai Po Nature Reserve remains over 100kg per year.

Besides Apple Snail and Mikania, WWF – Hong Kong is also monitoring invasive fish species *Tilapia*, the grass *Typha*, the mangrove *Sonneratia* species and *Acacia* tree species in Mai Po, while Environmental Association monitors and manages the plants *Wedelia trilobata*, *Asystasia gangetica* and the snail *Achatina fulica* in Fung Yuen. Regular removal and control of White Popinac and Water Hyacinth plants, the invasive mangrove *Sonneratia* species, the invasive fish species Tilapia, and Red Fire Ant are conducted in Hong Kong Wetland Park.

There is Mikania control in Lai Chi Wo and Sha Lo Tung since the commencement of the MA projects managed by The Conservancy Association and Green Power respectively. Apple Snails were still not found in Lai Chi Wo, but a small number were found in Sha Lo Tung. The Conservancy Association also removes Mikania within the village area and monitors the Red Fire Ant in Lai Chi Wo. In Sha Lo Tung, Green Power controls other invasive species as well, such as the freshwater fish Green Swordtail *Xiphophorus hellerii*, Variable Platyfish *Xiphophorus variatus* and Western Mosquitofish *Gambusia affinis*, and the plants Mile a minute vine *Ipomoea cairica*, *Bidens alba* and *Wedelia trilobata*.

However, the current effort is still far from eradicating these species from the territory. More systematic actions are needed to monitor and remove IAS effectively in order to prevent them from spreading further. Under the BSAP, a practice note for

clearing Mikania was updated¹⁰⁹ and an IAS risk assessment protocol was developed¹¹⁰. The risk assessment on herpetofauna found no “high risk” species and four “moderate risk” species.

UNRESOLVED ISSUE

When will systematic invasive species monitoring and removal programmes supported by AFCD be established in collaboration with other Government departments and relevant organizations in order to effectively reduce the colonization rate and impacts of alien invasive species on local biodiversity?

3.5 Trends in abundance and diversity of waterbirds

This indicator demonstrates the *state* of waterbirds and can serve as a check on the quality of habitats for local and migratory birds.

The total peak count refers to the sum of the peak numbers of each waterbird species from December to February, which represents the number of waterbirds dependent on Deep Bay during this mid-winter period. In the winter of 2017-2018, the peak count rose to a recent high of 66,291 individuals, but then in the winter of 2019-2020, the number dropped to record low at 50,030 individuals. The number of waterbird species recorded remained at around 70 species. The causes for such fluctuations in peak count is difficult to understand, as they are affected by factors both outside (i.e. habitat condition and threats along the East

Asian Australasian Flyway) and inside Hong Kong’s territory. Yet little has changed for local conservation actions in the Deep Bay area in recent years (Figure 18).

On-going disturbances and development threats

Although removal works is conducted in the Deep Bay area annually, the invasive alien mangrove tree *Sonneratia* still colonizes the mudflats and intertidal areas, which is gradually leading to a loss in foraging grounds for waterbirds. Disturbance by mudskipper collectors and other fishermen on the mudflats and intertidal areas continues to constitute an avoidable source of disturbance. Current enforcement and prosecution have failed to deter these activities. While hundreds of items of fishing gear have been seized, no one has yet been prosecuted¹¹². In a 2018 case, the offender was convicted and was only fined HK\$1,000 for entering the Restricted Area without a permit¹¹³.

TABLE 11 Trends in abundance and diversity of waterbirds from 2006-07 to 2019-20

	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020
Total peak count	80,108	90,986	87,633	87,379	76,679	72,492	61,674	51,573	53,711	55,509	56,354	66,291	51,874	50,030
No. of species	71	71	70	75	67	64	69	69	66	70	65	73	67	69

Source: AFCD - Mai Po Inner Deep Bay Ramsar Site Waterbird Monitoring Programme¹¹¹

FIGURE 18



Since 2012, the Management Agreement scheme conducted by HKBWS with the support of Government funding has ensured that the water levels of some 600 hectares of fishponds in the Deep Bay area are regularly lowered in order to provide suitable foraging habitats for waterbirds and wetland dependent birds.

Development threats to the Deep Bay wetland persist. In Nam Sang Wai, a high-rise residential development proposal (A/YL-NSW/242) was rejected in 2016 and 2017 by the TPB as it failed to demonstrate that the adverse ecological impacts of the proposed development could be adequately mitigated. In March 2018, two fires broke out at the grassy pond bunds and reedbeds of Nam Sang Wai within two days and both cases were suspected to be arson¹⁴. In May 2018, six environmental NGOs and concern groups conducted a public opinion survey on the conservation of Nam San Wai. Among the 1,003 people interviewed, 83% support the conservation of the natural landscape of Nam Sang Wai, while 61% support the use of land resumption and non-in-situ land exchange to permanently protect and conserve NSW¹⁵. "Development cum conservation" zonings like the "Other Specified Uses" for "Comprehensive Development and Wetland Enhancement Area" in Nam Sang Wai and Fung Lok Wai (please refer to Box 9), have given false hope to land owners and developers that they are allowed to maximise their development immediately next to or even within Deep Bay wetlands.

On the other side of the Inner Deep Bay outside Hong Kong's border, there are also potential threats from development projects. In September 2019, the Shenzhen Municipal Government proposed to extend a boat tour called "Shenzhen from the sea" further to the east, passing under the Shenzhen Bridge to reach areas including Shenzhen Talent Park and the Mangrove Ecological Park¹⁶. This new boat tour route would intrude into the "Shenzhen important coastal wetland restricted red line area", and is close to the internationally recognized "Mai Po Inner Deep Bay Ramsar Site" within the Hong Kong border. Dredging is required for this tourism development and activities, which would increase the human disturbance in the Deep Bay wetland ecosystem and threaten the foraging and roosting ground for migratory birds.

BOX 9

The controversy of residential development for conservation of Deep Bay wetlands: the Fung Lok Wai case

The residential development at Fung Lok Wai has already gone through procedures under both the EIAO (Cap. 499) and the TPO (Cap. 131), but there are various issues yet to be resolved before development may commence.

In 1992, the developer Cheung Kong applied for residential development of about 80 hectares of fishponds in Fung Lok Wai. In 2005, WWF – Hong Kong was invited to collaborate with the developer and to ensure the development complies with the public-private partnership (PPP) approach¹¹⁷. The development footprint was reduced to only five per cent of the site in 2008 and its EIA report was approved in 2009. An application to the TPB was made in 2011, but it received criticism and opposition from the general public and other environmental

NGOs, partly due to the inadequate ecological impact assessment on the newly discovered Hong Kong endemic Mai Po Bent-winged Firefly *Pteroptyx maipo*¹¹⁸. Later in May 2013, WWF – Hong Kong became concerned that the long term conservation objectives of the development could not be achieved and withdrew from the collaboration with the developer¹¹⁹, yet the TPB still approved the residential development in November in the same year¹²⁰. Environmental NGOs were concerned this approval will set an undesirable precedent for future similar applications, and would lower transparency making it difficult for the public to monitor how the PPP concept and the conservation objectives can be achieved in the development in the future¹²¹. The Fung Lok Wai fishponds have been inactive since 2016 (Figure 19).

In January 2019, the Buildings Department approved the plan for the Fung Lok Wai development of 19 residential blocks with 1,958 units¹²², but it is uncertain if the developer has found an environmental NGO for collaboration under the PPP approach. Approval of the Fung Lok Wai residential development made by the TPB went under judicial review¹²³. In September 2020, the High Court ruled TPB had illegally approved the development, and required the TPB to discuss the application again¹²⁴. EPD still have not granted the Environmental Permit to the development under the EIAO¹²⁵. This large scale residential development at Fung Lok Wai within the Wetland Conservation Area remains controversial and its conservation effectiveness is yet to be proven.

FIGURE 19



Fishpond operators were driven out of Fung Lok Wai since 2016 and the fishponds in the area are now abandoned.

3.6 Trends in populations of flagship and umbrella species

This indicator demonstrates the *state* of particular species, chosen according to their vulnerability together with their recognisability by the public (i.e. Chinese White Dolphins, breeding egrets and herons, and Buddhist Pine), or their representativeness of certain habitat types (i.e. dragonflies, Big-headed Turtle and Grassland Orchid).

Chinese White Dolphin (CWD)

The population of the CWD continues to decline. The number reached a historic low in 2018, with dolphin abundance of 32 and encounter rate of 3.0 sightings per 100 km. Even though the numbers bounced back slightly in 2019, more years of observation is needed to confirm whether the population is recovering in Hong Kong waters. The construction works for the Hong Kong – Zhuhai – Macao Bridge Project including the reclaimed Hong Kong Boundary Crossing Facilities since 2012 in North Lantau waters increased the severity of existing threats to the CWD. Even though the reclamation works were completed in 2017¹³⁴, new approved development projects continue. The reclamation and construction works for the Hong Kong International Airport’s Three-runway System commenced in August 2016¹³⁵, while the reclamation and advance works for the Tung Chung New Town Extension commenced in December 2017¹³⁶ (Figure 20). The ongoing reclamation works in the North Lantau waters is likely to cause the continuous decline of the CWD population with no signs of recovery¹³⁷.

FIGURE 20



Google Earth aerial photograph taken on 17 February 2020, showing the reclamation works and the associated marine traffic for the airport’s third runway and the Tung Chung East extension.

Even though the South Lantau waters seem to be less disturbed and the Southwest Lantau Marine Park was gazette in December 2019, there are still development threats in the area. The reclamation associated works of the Integrated Waste Management Facilities at Shek Kwu Chau commenced in 2018 ; while the EIA of the Hong Kong Offshore LNG Terminal, which will be situated immediately outside the proposed South Lantau Marine Park at Soko Islands (partly for the compensation of the Integrated Waste Management Facilities), was approved in 2018 as well¹³⁹. The heavy marine traffic, especially of high speed ferries and hydrofoils passing South Lantau waters between Hong Kong and Macau continues to be a threat to the CWD as they forage between the coast of Lantau and the Soko Islands¹⁴⁰.

TABLE 12 Trends in populations of flagship and umbrella species in Hong Kong from 2006 to 2019

		2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Chinese White Dolphin	Encounter rate per 100km ^{126,127}	6.9	9.9	7.2	6.3	6.8	7.6	7.3	7.2	5.5	4.7	4.1	3.4	3.0	3.5
	Abundance estimate in Lantau ¹²⁸	113	130	108	100	86	88	80	73	87	65	47	47	32	52
Breeding egrets and herons (no. of nests) ^{129,130}		1,017	822	664	809	734	803	852	758	960	1,418	1,248	1,245	1,082	1,633
Dragonfly diversity and abundance ¹³¹		68	80	83	79	85	94	95	93	92	87	87	79	90	93
Big-headed Turtle <i>Platysternon megacephalum</i>															
Buddhist Pine <i>Podocarpus macrophyllus</i>															
Grassland Orchid <i>Spathoglottis pubescens</i>															

26 male, 30 female, and 82 juvenile were recorded from 2009 to 2011¹³²

2000-3000 mature trees¹³³

Currently no systematic monitoring programme.

Breeding Egrets and Herons (Ardeids)

Although the total number of ardeids nests declined in recent years from the previous peak of 1,418 in 2015, the number rose to a new high of 1,633 nests in 2019. The Deep Bay area is still important for breeding Chinese Pond Heron and Little Egret as the number of nests in Deep Bay accounts for around 80% and 50% of the total numbers in Hong Kong. However, the breeding population of Eastern Cattle Egret dropped by two-thirds in the past decade, likely due to the loss in farmland habitats caused by development pressure¹⁴¹.

Even though the total number of ardeid nests reached a new high in 2019, several nesting colonies have still been impacted by undesirable incidents and on-going disturbance. The A Chau colony, which was the largest nesting colony in Hong Kong in the 2000s, was abandoned during both breeding seasons of 2018 and 2019. During the breeding season of 2019, dredging and draining works at the lakes in Penfold Park disturbed the breeding ardeids at the egretty. The birds returned after the works stopped and the lake was restored. Site formation works and erection of hoardings were detected near the Tai Tong egretty in the breeding season of 2019 as well, and only one nest was recorded that year. Trees at the Tung Shing Lane egretty were found to be pruned in May 2019.

Several development applications next to egrettries were approved or proposed. An equine experience centre near the Penfold Park egretty¹⁴² was approved by the TPB in 2019 and the environmental permit for the improvement works of Penfold Park was granted in 2020¹⁴³. A high-rise private housing development application, with residential blocks of 25 to 30 storeys high next to the Tung Shing Lei egretty, was submitted to the TPB in 2019 (A/YL-NSW/275).

Other flagship and umbrella species

The dragonfly data provided by AFCD showed a slight increasing trend in species diversity¹⁴⁴. The dragonfly species checklist increased from 123 species in 2016¹⁴⁵ to 128 species in 2019¹⁴⁶. Three of the five additional species were newly discovered in Hong Kong^{147,148,149} but all five species are considered vagrant (i.e. well outside their normal home range) in Hong Kong at the moment. Similar to the previous reporting period (2014 – 2016), dragonflies associated with forest habitats are considered to be relatively well-protected within the protected areas of Hong Kong. However, there are fewer secure habitats for pond-associated dragonfly species¹⁵⁰. There are not many fish-free ponds, marshes, wet paddies and lowland streams left in Hong Kong, principally as a result of change in land use or urbanization. These habitats are often outside the protected areas system and are facing imminent development pressure.

The Big-headed Turtle is native to Hong Kong and is a globally endangered species. Even though some of the populations within protected areas or areas with active biodiversity management plans are healthy; it is suspected that some other populations in Hong Kong may be declining, due to illegal trapping triggered by high demand in the food and pet market. Even within protected areas, wild turtles including Big-headed Turtle, Reeves' Turtle and Chinese Three-striped Box Turtle are not necessarily safe from poachers as illegal trapping and smuggling back to mainland China continues to be detected^{151,152,153}. Enforcement actions need to be stepped up on the trapping, selling and trading of wild turtles to better protect this and other endangered species from depleting in the wild.

Grassland Orchid is a widespread and abundant species in Hong Kong, with an estimated large and stable population of over 4,000 individuals¹⁵⁴. It is commonly found in open upland grassland, and can also be seen along paths and on rocky outcrops in semi-shade in secondary woodland. However, similar to the Big-headed Turtle and Buddhist Pine, there are no publicly available data or systematic monitoring programme of these key indicator species. It should be noted that Grassland Orchid is included as an indicator for the presence of grassland habitats. This habitat is being lost due to natural succession of grassland into shrubland and secondary forest.

Generally speaking, dragonflies, Big-headed Turtle, Buddhist Pine and Grassland Orchid all lack publicly available data or systematic monitoring programme to track the population of these key indicator species. Resources are needed to fill in these data gaps for monitoring the status of these indicator species, or else other suitable species should be selected instead.

UNRESOLVED ISSUE

The on-going development pressure reflects the need of a holistic and long-term management for the conservation of waterbirds in Deep Bay area, Chinese White Dolphin, and egrettries in Hong Kong.

Resources are needed to monitoring the status of indicator species, or else other suitable species should be selected instead.

4

HEADLINE INDICATOR 4: REVERSING IMPACTS ON GLOBAL BIODIVERSITY

4.1 Hong Kong's Ecological Footprint

This indicator depicts the *pressure* of Hong Kong's consumption demand on natural ecosystems and biodiversity.

Hong Kong has been running an ecological deficit - the goods and services that the land in Hong Kong provides cannot meet the demand of the city's population. According to the latest ecological footprint data provided by WWF - Hong Kong in 2019¹⁵⁶, while the amount of global renewable resources per capita remained at about 1.7 – 1.8 gha for the past decade, the city's use of ecological resources rose by almost 60% from 4.4 gha in 2005 to 7.0 gha in 2014. Hong Kong has the second highest ecological footprint in the Asia-Pacific region and tenth worst globally, with food, clothing, personal transportation and electricity accounts for half of the footprint. It is clear that there is a need to reduce

over-consumption, improve energy efficiency, and encourage use of renewables to cut down Hong Kong's ecological footprint.

The Sustainable Development Fund under the Government-appointed Council for Sustainable Development has offered financial support to promote public awareness of sustainable development since 2004, and the priority area "sustainable use of biological resources" was selected for the 12th and 13th round of application (i.e. project periods of 2017-2019 and 2019-2021)¹⁵⁷. However, it is uncertain how these short-term projects can be sustained in the long run and create an impact on the community. An interesting on-going funded project is the sustainable consumption behaviour study by the Consumer Council, which will compare and review if there are any changes in consumers' attitudes and behaviour with their baseline study conducted in 2015. This study will be used to formulate recommendations on Government policy, business practices and consumer education on sustainable consumption¹⁵⁸.

TABLE 13 Hong Kong's ecological footprint from 2005 to 2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Hong Kong Ecological Footprint per capita (global hectares) ¹⁵⁵	4.4	-	4.0	4.7	-	5.4	-	6.7	-	7.0
Global Biocapacity per capita (global hectares) ¹⁵⁵	2.1	-	1.8	1.8	-	1.7	-	1.7	-	1.7

Data source: WWF – Hong Kong

Illegal possession of threatened and protected species

In January 2018, one of the largest live animal seizures occurred in Yuen Long, where hundreds of animals, including endangered and protected species such as Leopard Cat, Civet Cat, Barn Owl and Giant Salamander, were kept in a property which was also used to provide animal hospice service¹⁵⁹. The offender was finally sentenced to 160 hours of community service and his pet cremation service company was fined HK\$35,000¹⁶⁰. The penalty for this case with such a large number of wildlife involved was considered to be low and ineffective to deter those involved in the illegal wildlife trade. Even though the maximum sentences of the Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586) was strengthened in May 2018 (please refer to Box 10), it was not applicable to this case as it occurred before the law amendment. In September 2019, an applicant with the same name as the offender applied through the TPB for

temporary animal boarding establishment with hospice services at the same location (planning application no. A/YL-SK/263), but the application was rejected by the Board in early 2020¹⁶¹.

UNRESOLVED ISSUE

What measures and policies are needed to facilitate business sectors and the general public to live a sustainable lifestyle so as to reduce Hong Kong's ecological footprint?

When will Hong Kong take serious action to stop the city being used as a trading hub for threatened species and treat wildlife crime as serious and organised crime?

BOX 10

Amendment of the Protection of Endangered Species of Animals and Plants Ordinance (Cap.586)

The amendment of Cap. 586 and the increase in penalties came into effect on 1 May 2018, with a maximum fine of \$10 million and imprisonment for 10 years; while the phased ban of import and re-export of pre-Convention (i.e., Convention on International Trade in Endangered Species of Wild Fauna and Flora) ivory commenced in August the same year¹⁶². Since then, the penalties imposed on the offenders have increased.

Taking ivory, rhino horn and live tortoises as examples, sentences increased from weeks and months-long imprisonments to sentences in excess of a year (Table 14). These typically related to seizures hidden in the luggage of inbound air travelers. However, these seizure volumes are incomparable with those seized from container cargos. Such high-volume shipments are less frequently prosecuted. Indeed, some of Hong Kong's most infamous seizures from containers

have not been pursued in the courts, including the record-breaking seizure of 8.3 metric tonnes of pangolin scales and 2.1 metric tonnes of elephant tusks – valued at HK\$62 million, seized in 2019¹⁶³. Despite positive signs of increased sentencing, the lack of prosecutions in relation to some of the city's notable trafficking cases remain troubling and should be addressed through more robust investigations, targeting those behind the trafficking operations as well as confiscating the proceeds of the crimes.

TABLE 14

Information provided through ADM Capital Foundation's Courtroom Monitoring Programme regarding smuggling and/ or illegal possession cases involving ivory, rhino horn and live tortoise before and after the strengthening of the maximum penalty under the Protection of Endangered Species of Animals and Plants Ordinance (Cap. 586) on 1 May 2018.

Date of Seizure	Nature of seizure	Date of Sentencing	Item(s) involved	Estimated market price	Sentence
14 Feb 2014	N/A	N/A	127 live Radiated tortoises and 10 live Ploughshare tortoises	N/A	6 weeks' imprisonment
10 Feb 2015	Seized from a local premises	N/A	60kg of cut ivory pieces	HK\$600,000	HK\$70,000 financial penalty, revised to 6 months' imprisonment on default of payment
12 Nov 2017	Seized from an air passenger	13 Nov 2017	1.8kg of rhino horn	HK\$360,000	6 weeks' imprisonment
20 May 2019	N/A	23 Oct 2019	1.3kg of rhino horn	HK\$351,000 -723,000	12 months' imprisonment
23 Sept 2019	Seized from an air passenger	10 Sept 2020	55.3kg of ivory (35.5kg of raw tusks and 20kg of worked ivory)	HK\$577,000	24 months' imprisonment
28 Sept 2019	N/A	1 April 2020	55 live Radiated tortoises and 2 live Ploughshare tortoises	HK\$816,555	24 months' imprisonment

4.2 Change in greenhouse gas emissions attributable to Hong Kong

This indicator shows the *state* of the environment though trends in greenhouse gas emissions arising from human activities. Data collected by government departments concerned (i.e. Environmental Protection Department) and environmental NGO (i.e. WWF – Hong Kong) are compared to illustrate the degree to which the government's data is providing the full picture.

In 2017 and 2018, both the greenhouse gas emission estimate and the emission per capita in Hong Kong reached their lowest levels since 2005. The greenhouse gas emission level fluctuated around 42.0 million tonnes over the course of 14 years. The per capita emission showed a gently decreasing trend of about 0.04 tonnes per year; however, with this rate of reduction it would take us about 40 years to achieve the upper limit of our 2030 target of 3.8 tonnes (see below).

TABLE 15 Change in greenhouse gas emissions attributable to Hong Kong from 2005 to 2018

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Total emission estimate by EPD (million tonnes) ^{164*}	41.2	42.2	42.8	41.5	42.3	40.8	42.5	42.5	43.8	44.5	41.1	41.3	40.4	40.6
Per capita emission estimate by EPD (tonnes) ^{165*}	6.0	6.2	6.2	6.0	6.1	5.8	6.0	5.9	6.1	6.2	5.6	5.6	5.5	5.4
Per capita emission estimate by WWF - Hong Kong (tonnes)	-	-	8.1	-	-	13.4 ^{166^}	-	-	-	-	-	-	-	-

* Numbers are updated as there are slight adjustments in the figure from year to year according to the data provided by the Environmental Protection Department.

[^] The data from the WWF – Hong Kong report in 2010 was more than doubled that estimated by EPD as the calculation included emissions from air travel which accounts for more than half of the individual carbon footprint. The calculation by EPD only included the local emission within Hong Kong.

Emission targets

In the Hong Kong Climate Action Plan 2030+ published in 2017, the Government set a 2020 carbon emission targets of reduction by 20% using 2005 as the base (i.e. reduce to around 33.0 million tonnes) and per capita emission at 4.5 tonnes or less; while the 2030 target was to reduce by 26-36% using 2005 level as the base (i.e. reduce to around 26.4 to 30.5 million tonnes) and per capita emission at around 3.3 to 3.8 tonnes¹⁶⁷. Comparing these targets with Hong Kong's performance since 2005, a reduction of 1.5% in greenhouse gas emission and 0.6 tonnes in per capita emission was achieved up till 2018, which is still far from on track in reaching the 2020 target and not to mention the intended 2030 target. An ambitious target and achievable strategy is required for Hong Kong to catch up the progress to the previously proposed target.

Under the Paris Agreement, Hong Kong is obligated to set a reduction target and formulate its corresponding decarbonisation strategy up to 2050 by 2020¹⁶⁸. In June 2019, the Government launched a six-month public consultation for the Long-term Decarbonisation Strategy, in hope to raise public awareness on the consequences of carbon emission and to gather public's view on carbon reduction strategy¹⁶⁹. In the 2020 Policy Address, the Chief Executive announced the latest decarbonization target is to achieve carbon neutrality by 2050¹⁷⁰.

In order to achieve this goal, the government needs to roll out a comprehensive roadmap to lead different sectors of society to move towards the goal.

Power generation

Over the decade, the ratio of emissions between sectors did not change much, with electricity and gas generation accounting for about two-thirds of the total emission, while transportation contributed just under 20%¹⁷¹. It is expected that more natural gas will be used for electricity generation and this will cut down the greenhouse gas emission in Hong Kong, as the two power companies are building new gas-fired generating units at their power stations and will decommission the existing coal-fired generating units. CLP Power Hong Kong Limited already stated that it has increased the proportion of gas-fired generation to around 50% and achieved a reduction of about 20% in carbon intensity in 2020¹⁷².

In addition, the use of renewable energy such as photovoltaic panels are explored in various locations (Figure 21). However, there are also concerns on the site selection of solar energy system installation as it may cause potential adverse ecological impacts and undesirable precedent in conservation and agricultural land use zonings (please refer to Box 11).

UNRESOLVED ISSUE

Renewable energy should be promoted as it reduces our reliance on fossil fuels, but it is equally important to ensure its installation and operation would not generate adverse ecological impacts on wildlife and the surrounding natural environment.

FIGURE 21



In 2017, WSD also implemented small-scale floating photovoltaic system projects at Shek Pik Reservoir (above) and Plover Cove Reservoir as a pilot scheme to investigate the possibility of large-scale floating PV farms on reservoirs in Hong Kong¹⁷³.

BOX 11

Solar panel installation in rural areas

In 2017, the Government signed new 15-year Scheme of Control Agreements with the two power companies in Hong Kong¹⁷⁴, which include the use of Feed-in Tariff (FiT) to promote renewable energy development. Both power companies offered FiT rates according to the generation capacity of the renewable energy system installed, ranging from HK\$3 to \$5 per unit of electricity (kWh)^{175,176}.

A planning application for temporary facilities related to an offshore solar panel installation appeared in 2018 (Figure 22). Since then, the number of applications for solar panel installation submitted to the TPB increased. From two applications in 2018, to four applications in 2019, then further to 12 applications in 2020. Over half of these 18 applications were located within

GB and AGR zonings. Some even encroached onto farmlands, wetlands or vegetated hillside in the rural areas. After the approval of the first application for solar panel installation on 3m-high steel racks at a site on a temporary basis of five years in 2019¹⁷⁷, the TPB withheld other applications and discussed the assessment criteria for applications of solar energy system installation for the FiT scheme. The criteria was finalized in July 2020^{178,179}. In October 2020, another application was approved¹⁸⁰, which is a proposed pilot solar farm project of about 13,650 m² at a landfill¹⁸¹.

The aforementioned assessment criteria may not be effective to protect important natural habitats in rural areas, particularly if the relevant Government departments do not have adverse comments on the application. A third solar panel

installation was approved in November 2020; even though the site is a suspected unauthorized development¹⁸². PlanD and AFCD did not mention the site is “*within a large piece of freshwater marsh*” as in a previous rejected small house application in the same site¹⁸³, but instead stated the surroundings is fallow agricultural land¹⁸⁴.

Switching to solar energy indeed can reduce the community's reliance on fossil fuels. However, the location of installation needs to be carefully selected to avoid adverse impacts on the local environment, ecology and possible implications on the future use of such land use zoning. Particularly in rural well-vegetated areas, there is currently a conflict between the promotion of renewable energy development, the local ecology, and the intended use of land under its respective zoning (e.g. AGR, GB).

FIGURE 22



Coastal wetlands in the Ha Pak Nai area. In 2018, there was an application for temporary staff common room and store room in “Coastal Protection Area” zone (A/YL-PN/51), which was related to a 5,000m² offshore solar panel installation project at the coast of Ha Pak Nai in Deep Bay area. The approval of the solar panel project was yet to be obtained from relevant Government department, and the application for temporary staff common room was eventually rejected by the TPB.

5

HEADLINE INDICATOR 5: PLANS AND RESOURCES FOR BIODIVERSITY CONSERVATION

5.1 In how many months' time will an approved, resourced and active BSAP that meets the principles and standards of the CBD be in place?

This indicator shows the *response* by government to act on nature conservation, through the establishment and fully resourced implementation of a BSAP for Hong Kong.

Implementation of Hong Kong's BSAP 2016-2021

Hong Kong's first BSAP was published in late 2016 with HK\$150 million earmarked for the first three years of implementation¹⁸⁵. This is an important milestone since China extended the CBD to Hong Kong in 2011¹⁸⁶. BSAP has been implemented in Hong Kong for about four years and progress updates prepared by Environment Bureau and AFCDC are presented to the ACE every year. The corresponding document is available online¹⁸⁷.

The current BSAP has proposed four areas of actions, with a total of 23 proposed actions. Under these proposed actions, there are 67 specific actions supported by 110 expected deliverables as reported in the latest progress report on BSAP implementation as of December 2020¹⁸⁸. More than half of the proposed actions have on-going specific actions with corresponding deliverables. If examined closely, the short/medium/long-term specific actions (i.e. other than the on-going ones) may not necessarily have been newly proposed under the BSAP. They maybe proposed before the launch of the BSAP, such as the designation of The Brothers Marine Park and the

Long Valley Nature Park (Figure 23). Therefore, without the BSAP, Hong Kong is already contributing a certain degree of effort in biodiversity conservation.

Area 1 (enhancing conservation measures) had the most expected deliverables that were newly proposed and with targeted completion timeframe, such as the adoption of a biodiversity management plan for the proposed Robin's Nest Country Park, formulation of new species action plans for more threatened species, and formulation of management measures for high-risk invasive alien species identified. However, many actions are still in progress and some are already behind schedule. For instance, the Finless Porpoise species action plan was targeted to be formulated and implemented by the end of 2018, but now it is expected to be finalized by 2021.

FIGURE 23



The construction of an irrigation channel within the Long Valley Nature Park in September 2020. The development of the 37-hectare Long Valley Nature Park was confirmed in the Revised Recommended Outline Development Plans of the North East New Territories New Development Areas Planning and Engineering Study back in July 2013¹⁸⁹. The corresponding statutory plans were updated accordingly and were approved in 2015¹⁹⁰.

All four BSAP actions under Area 2 (mainstreaming biodiversity) already have on-going deliverables, such as revitalization of water bodies carried out by DSD. There are also a few deliverables involving inter-departmental/bureaux collaboration, but they were mainly formulated to allow works departments/bureaux to be better informed about biodiversity considerations. This does not necessarily stop or prevent developments, as ecological concerns is just one of the factors to be considered during the planning and development process.

Area 3 (improving our knowledge) had the least expected deliverables among the four areas, yet some of them were important newly proposed deliverables, for example the compiling of a list of threatened species for Hong Kong to guide conservation actions, and the development of a Geographic Information System-based platform to facilitate the sharing of data. There was also a deliverable significantly behind schedule (i.e. under Action 17, a 24-month consultancy study to obtain baseline information of ecosystem services commenced in March 2020 and expected to be completed in 2022, which was due to be completed in 2020), and another one which was vaguely reported (i.e. under Action 18, research on traditional knowledge has been listed as one of the priority research topics to be supported under Action 19).

Area 4 (promoting community involvement) had the least on-going deliverables, but also the most completed expected deliverables. This is because many of the deliverables were not specific and some lacked a timeframe (e.g. education programmes organized in country parks, members of the public engaged to participate in citizen science projects, teachers' seminar/workshops on biodiversity organized), thus the targets can be easily met but have limited value.

Comments on Hong Kong's first BSAP and recommendations for the next

As explained above, many of the BSAP's proposed actions and expected deliverables are in fact on-going initiatives that were proposed before the launch of BSAP. Under Hong Kong's first BSAP, the contribution to biodiversity conservation of these works is recognized. Even though budget was earmarked for the BSAP, it is uncertain how it supported the various deliverables and whether sufficient manpower was also assigned to (not only within Environment Bureau and AFCD, but also other Government departments) to implement the various conservation actions. It was reported that only one AFCD staff was employed to coordinate the management of all 68 SSSI sites in Hong Kong, and that such manpower and resources were inadequate to protect these sensitive areas from on-going development threats¹⁹¹. Therefore, it is important to ensure there is both

adequate "permanent" budget and manpower to carry out the proposed conservation actions, and these newly proposed actions or conservation concepts can be internalized within the current system across departments.

The inadequacies of this BSAP also include also the lack of specific targets with timeframes and monitoring indicators such that the progress of the BSAP implementation can be effectively assessed. It is also unknown on how and to what extent that the proposed BSAP actions can contribute to the Aichi Biodiversity Targets (ABT) under the CBD. Furthermore, deficiencies as reported in this and previous reports (i.e. long-existing loopholes in land use enforcement, please refer to section 1.1 of this report) were not addressed in the current BSAP.

The Government's good intentions in kick-starting the BSAP process with funding earmarked should be encouraged and continue with the formulation of the next 5-year BSAP for 2021-2026. Specific, measurable, attainable, relevant and time-bound targets should be set to effectively monitor Hong Kong's progress, with reference to the CBD's latest Post-2020 Framework, such that the strengths and weaknesses in the nature conservation work in Hong Kong can be identified and further improved. A set of consistent parameters and corresponding data should be used for regular monitoring of the BSAP implementation. A simple but meaningful summary of the technical report to ACE on the BSAP implementation should be provided to facilitate the public's understanding on the BSAP progress. The next BSAP should also make clear how the BSAP budget and manpower contributes to the existing and new initiatives.

In addition, conflicts between development and conservation policies should be actively addressed, in order to stop the current on-going loss in biodiversity and natural habitats (e.g. approved development in conservation zones and the continuous decline in the number of CWD). The 400 and more specific actions recommended by experts and academics in different focus/working group during two-year participatory process for the formulation of BSAP in 2013 and 2014 should also be considered to be incorporated into the next BSAP^{192,193}.

UNRESOLVED ISSUE

When will the Government set specific, measurable, attainable, relevant and time-bound targets and select indicators to monitor the conservation progress and implementation of BSAP in Hong Kong?

APPENDICES, GLOSSARY AND REFERENCE



APPENDICES

APPENDIX 1 List of IUCN threatened species (CR, EN and VU*) found in Hong Kong in 2019

* IUCN conservation status abbreviation:

CR – Critically Endangered

EN – Endangered

VU – Vulnerable

NT – Near Threatened

DD – Data Deficient

The IUCN Red List during 2017 – 2019:

■ Species newly added

■ Species uplisted

■ Species downlisted

No.	Species	Common name	Group	Status as of 2019*	Species action plans (SAP)/ Species-specific conservation action (Con. action)
1	<i>Aythya baeri</i>	Baer's Pochard	Bird	CR	-
2	<i>Fregata andrewsi</i>	Christmas Island Frigatebird	Bird	CR	Global SAP #
3	<i>Grus leucogeranus</i>	Siberian Crane	Bird	CR	Global SAP #
4	<i>Eurynorhynchus pygmeus</i>	Spoon-billed Sandpiper	Bird	CR	Global SAP
5	<i>Emberiza aureola</i>	Yellow-breasted Bunting	Bird	CR	-
6	<i>Cacatua sulphurea</i>	Yellow-crested Cockatoo	Bird	CR	-
7	<i>Bahaba taipingensis</i>	Chinese Bahaba	Fish	CR	-
8	<i>Manis pentadactyla</i>	Chinese Pangolin	Mammal	CR	Local SAP
9	<i>Diospyros vaccinioides</i>	Small Persimmon	Plant	CR	-
10	<i>Aristolochia westlandii</i>	Westland's Birthwort	Plant	CR	-
11	<i>Paphiopedilum purpuratum</i>	Hong Kong Lady's Slipper Orchid	Plant	CR	Con. action
12	<i>Cuora trifasciata</i>	Three-banded Box Turtle	Reptile	CR	Local SAP
13	<i>Eretmochelys imbricata</i>	Hawksbill Turtle	Reptile	CR	-
14	<i>Typhlops lazelli</i>	Hong Kong Blind Snake	Reptile	CR	-
15	<i>Caridina apodosis</i>	-	Shrimp	CR	-
16	<i>Liuixalus romeri</i>	Romer's Tree Frog	Amphibian	EN	Local SAP
17	<i>Xenophrys brachykolos</i>	Short-legged Toad	Amphibian	EN	-
18	<i>Amolops hongkongensis</i>	Hong Kong Cascade Frog	Amphibian	EN	-
19	<i>Ciconia boyciana</i>	Oriental Stork	Bird	EN	-
20	<i>Platalea minor</i>	Black-faced Spoonbill	Bird	EN	Global SAP
21	<i>Gorsachius goisagi</i>	Japanese Night Heron	Bird	EN	-
22	<i>Tringa guttifer</i>	Nordmann's Greenshank	Bird	EN	-
23	<i>Numenius madagascariensis</i>	Eastern Curlew	Bird	EN	-
24	<i>Calidris tenuirostris</i>	Great Knot	Bird	EN	-
25	<i>Aquila nipalensis</i>	Steppe Eagle	Bird	EN	-
26	<i>Somaniathelphusa zanklon</i>	-	Crab	EN	-
27	<i>Gomphidia kelloggi</i>	Chinese Tiger	Dragonfly	EN	-
28	<i>Epinephelus akaara</i>	Hong Kong Grouper	Fish	EN	-
29	<i>Cheilinus undulatus</i>	Humphead Wrasse	Fish	EN	-
30	<i>Sphyrna mokarran</i>	Hammerhead Shark	Fish	EN	-
31	<i>Anguilla japonica</i>	Japanese Eel	Fish	EN	-
32	<i>Parargyrops edita</i>	Threadfin Porgy	Fish	EN	-
33	<i>Coilia mystus</i>	Osbeck's Grenadier Anchovy	Fish	EN	-
34	<i>Coilia nasus</i>	Japanese Grenadier Anchovy	Fish	EN	-

Although there are global SAPs for Christmas Island Frigatebird and Siberian Crane, they do not cover Hong Kong because it is an extremely rare vagrant (i.e. well outside their normal home range) in Hong Kong.

No.	Species	Common name	Group	Status as of 2019*	Species action plans (SAP)/ Species-specific conservation action (Con. action)
35	<i>Tachypleus tridentatus</i>	Tri-spine Horseshoe Crab	Horseshoe crab	EN	-
36	<i>Acanthephippium sinense</i>	Chinese Jug Orchid	Plant	EN	-
37	<i>Ilex graciliflora</i>	Small-flowered Holly	Plant	EN	-
38	<i>Camellia hongkongensis</i>	Hong Kong Camellia	Plant	EN	Con. action
39	<i>Habenaria leptoloba</i>	Fairy Orchid	Plant	EN	-
40	<i>Cuora flavomarginata</i>	Yellow-lined Box Terrapin	Reptile	EN	-
41	<i>Platysternon megacephalum</i>	Big-headed Turtle	Reptile	EN	Con. action
42	<i>Sacalia bealei</i>	Beal's-eyed Turtle	Reptile	EN	-
43	<i>Mauremys mutica</i>	Chinese Box Terrapin	Reptile	EN	-
44	<i>Mauremys sinensis</i>	Chinese Stripe-necked Turtle	Reptile	EN	-
45	<i>Palea steindachneri</i>	Steindachner's Soft-shelled Turtle	Reptile	EN	-
46	<i>Chelonia mydas</i>	Green Turtle	Reptile	EN	Local SAP
47	<i>Mauremys reevesii</i>	Reeves' Turtle	Reptile	EN	-
48	<i>Dibamus bogadeki</i>	Bogadek's Burrowing Lizard	Reptile	EN	-
49	<i>Paa exilispinosa</i>	Lesser Spiny Frog	Amphibian	VU	-
50	<i>Paa spinosa</i>	Giant Spiny Frog	Amphibian	VU	-
51	<i>Chroicocephalus saundersi</i>	Saunders's Gull	Bird	VU	-
52	<i>Synthliboramphus wumizusume</i>	Japanese Murrelet	Bird	VU	-
53	<i>Anser erythropus</i>	Lesser White-fronted Goose	Bird	VU	-
54	<i>Anas luzonica</i>	Philippine Duck	Bird	VU	-
55	<i>Egretta eulophotes</i>	Swinhoe's Egret	Bird	VU	-
56	<i>Aquila clanga</i>	Greater Spotted Eagle	Bird	VU	-
57	<i>Aquila heliaca</i>	Eastern Imperial Eagle	Bird	VU	-
58	<i>Ichthyaetus relictus</i>	Relict Gull	Bird	VU	-
59	<i>Pitta nympha</i>	Fairy Pitta	Bird	VU	-
60	<i>Acrocephalus tangorum</i>	Manchurian Reed Warbler	Bird	VU	-
61	<i>Locustella pleskei</i>	Styan's Grasshopper Warbler	Bird	VU	-
62	<i>Rhinomyias brunneatus</i>	Brown-chested Jungle Flycatcher	Bird	VU	-
63	<i>Emberiza sulphurata</i>	Japanese Yellow Bunting	Bird	VU	-
64	<i>Podiceps auritus</i>	Horned Grebe	Bird	VU	-
65	<i>Aythya ferina</i>	Common Pochard	Bird	VU	-
66	<i>Phylloscopus ijimae</i>	Ijima's Leaf Warbler	Bird	VU	-
67	<i>Emberiza rustica</i>	Rustic Bunting	Bird	VU	-
68	<i>Graminicola striatus</i>	Chinese Grassbird	Bird	VU	-
69	<i>Rissa tridactyla</i>	Black-legged Kittiwake	Bird	VU	-
70	<i>Onychoprion aleuticus</i>	Aleutian Tern	Bird	VU	-
71	<i>Corvus torquatus</i>	Collared Crow	Bird	VU	-
72	<i>Cryptopotamon anacoluthon</i>	-	Crab	VU	-
73	<i>Orthetrum poecilops poecilops</i>	Mangrove Skimmer	Dragonfly	VU	-
74	<i>Macromia katae</i>	South China Cruiser	Dragonfly	VU	-
75	<i>Hippocampus kuda</i>	Estuary Seahorse	Fish	VU	-
76	<i>Hippocampus trimaculatus</i>	Three-spot Seahorse	Fish	VU	-
77	<i>Tilapia joka</i>	Perche africaine	Fish	VU	-

No.	Species	Common name	Group	Status as of 2019*	Species action plans (SAP)/ Species-specific conservation action (Con. action)
78	<i>Cyprinus carpio</i>	Common carp	Fish	VU	-
79	<i>Epinephelus bruneus</i>	Longtooth Grouper	Fish	VU	-
80	<i>Plectropomus laevis</i>	Blacksaddled Coral Grouper	Fish	VU	-
81	<i>Nemipterus virgatus</i>	Golden Threadfin Bream	Fish	VU	-
82	<i>Hippocampus kelloggi</i>	Great Seahorse	Fish	VU	-
83	<i>Carcharhinus falciformis</i>	Silky Shark	Fish	VU	-
84	<i>Neophocaena phocaenoides</i>	Finless Porpoise	Mammal	VU	-
85	<i>Sousa chinensis</i>	Indo-Pacific Humpback Dolphin	Mammal	VU	Local SAP
86	<i>Myotis pilosus</i>	Rickett's Big-footed Myotis	Mammal	VU	-
87	<i>Camellia crapnelliana</i>	Crapnell's Camellia	Plant	VU	Con. action
88	<i>Castanopsis concinna</i>	Hairy Chestnut	Plant	VU	Con. action
89	<i>Loropetalum subcordatum</i>	Hong Kong Witch-hazel	Plant	VU	-
90	<i>Aquilaria sinensis</i>	Incense Tree	Plant	VU	Local SAP
91	<i>Artocarpus hypargyreus</i>	Silver-back Artocarpus	Plant	VU	-
92	<i>Dalbergia balansae</i>	South China Rosewood	Plant	VU	-
93	<i>Aralia chinensis, Abelmoschus moschatus</i>	Musk mallow	Plant	VU	-
94	<i>Aristolochia thwaitesii</i>	Seaside Dutchman's Pipe	Plant	VU	-
95	<i>Camellia granthamiana</i>	Grantham's Camellia	Plant	VU	Con. action
96	<i>Dermochelys coriacea</i>	Leatherback Turtle	Reptile	VU	-
97	<i>Caretta caretta</i>	Loggerhead Turtle	Reptile	VU	-
98	<i>Cuora amboinensis</i>	Malayan Box Turtle	Reptile	VU	-
99	<i>Pelodiscus sinensis</i>	Chinese Soft-shelled Turtle	Reptile	VU	-
100	<i>Lepidochelys olivacea</i>	Olive Ridley Turtle	Reptile	VU	-
101	<i>Ophiophagus hannah</i>	King Cobra	Reptile	VU	-
102	<i>Python bivittatus</i>	Burmese Python	Reptile	VU	Con. action
103	<i>Naja atra</i>	Chinese Cobra	Reptile	VU	-
104	<i>Caridina trifasciata</i>	-	Shrimp	VU	-
105	<i>Kaliella hongkongensis</i>	-	Snail	VU	-
106	<i>Chlorilis hungerfordiana ssp. rufopila</i>	-	Snail	VU	-
107	<i>Pelecanus crispus</i>	Dalmatian Pelican	Bird	NT	-
108	<i>Epinephelus lanceolatus</i>	Giant grouper	Fish	DD	-

APPENDIX 2 Country Park enclaves currently still not protected by the Country Park Ordinance (Cap.208) or the Town Planning Ordinance (Cap. 131) as of the end of 2020

No.	Name of Site	Area (hectares)
PAT SIN LENG COUNTRY PARK		
1	Ping Shan Chai	15
PLOVER COVE COUNTRY PARK		
2	Hung Shek Mun Tsuen	10
3	Lai Tau Shek	10
SAI KUNG EAST & WEST COUNTRY PARKS		
4	Tung Sam Kei	4
5	Nam Shan Tung	5
6	Lai Chi Chong	16
7	Tai Hom	5
8	Wong Chuk Long	4
9	Site near Wong Mau Kok	3
LANTAU SOUTH, NORTH & NORTH (EXTENSION) COUNTRY PARKS		
10	Tsin Yue Wan	4
11	Tei Tong Tsai	15
12	Yi Tung Shan	7
13	Man Cheung Po	2
14	Site near Peaked Hill	5
TAI MO SHAN COUNTRY PARK		
15	Site near Chuen Lung	10
16	Site near Tso Kung Tam	9
TAI LAM COUNTRY PARK		
17	Tsing Fai Tong	26
18	Sheung Tong	10
19	Sheung Fa Shan	26

GLOSSARY (Acronyms and Abbreviations)

ABT	Aichi Biodiversity Targets, 20 measurable targets for biodiversity conservation aimed to be achieved by 2020. They were proposed in the Strategic Plan for Biodiversity 2011-2020 which was agreed by the Parties to the CBD in 2010.	EIA	Environmental Impact Assessment
ACE	Advisory Council on the Environment	EIAO	Environmental Impact Assessment Ordinance (Cap. 499)
AFCDD	Agriculture, Fisheries and Conservation Department	EN	Endangered (IUCN Red List conservation status)
AGR	Agriculture, a land use zoning in statutory plans under the TPO, which intends to retain and safeguard good quality agricultural land/farm/fish ponds for agricultural purposes, and retain fallow arable land for cultivation and other agricultural purposes.	EP	Environmental Permit
BSAP	Biodiversity Strategy and Action Plan	EPD	Environmental Protection Department
CA	Conservation Area, a land use zoning in statutory plans under the TPO, which intends to protect and retain the existing important natural features of the area for conservation, educational and research purposes. There is a general presumption against development in this zone.	FIT	Feed-in Tariff, a scheme which people can sell the electricity generated from the renewable energy system at their premises to the power companies at a rate higher than the normal electricity tariff rate.
CBD	Convention on Biological Diversity	GB	Green Belt, a land use zoning in statutory plans under the TPO, which intends to conserve the natural environment for its buffering function in the city and as a passive recreational outlet. There is a general presumption against development in this zone.
CEDD	Civil Engineering and Development Department	HCMP	Habitat Creation and Management Plan
CMPB	Country and Marine Parks Board	HKBWS	Hong Kong Bird Watching Society
CPA	Coastal Protection Area, a land use zoning in statutory plans under the TPO, which intends to conserve, protect and retain the natural coastlines and the sensitive coastal natural environment with a minimum of built development. There is a general presumption against development in this zone.	HKSAR	Hong Kong Special Administrative Region
CR	Critically Endangered (IUCN Red List conservation status)	IAS	invasive alien species
CWD	Chinese White Dolphin	IUCN	International Union for Conservation of Nature
DSD	Drainage Services Department	LandsD	Lands Department
DPA	Development Permission Area, a statutory plan under the TPO often cover rural areas to control unauthorized developments. It empowers the Planning Department to carry out enforcement actions in areas covered by a DPA or an OZP which has replaced a DPA. DPA is only effective for three years from the date of gazette, an OZP will be prepared and replaced within the period.	LC	Least Concern (IUCN Red List conservation status)
		LMC	Lok Ma Chau
		MA	Management Agreement, collaboration between NGOs and landowners for nature conservation with the support of government funds.
		NGOs	Non-governmental Organizations
		NT	Near Threatened (IUCN Red List conservation status)
		OZP	Outline Zoning Plan, a statutory plan under the TPO which shows the land use zonings of an area and is published by the Town Planning Board. New towns and urban areas are usually directly covered by OZPs.

PEP	Plantation Enrichment Programme, a programme launched by AFCD which aims to increase the biodiversity and ecological value of plantations in country parks by thinning of exotic tree species, planting of native tree seedlings and post-planting maintenance.	STS	septic tanks and soakaway systems
PlanD	Planning Department	STT	Short Term Tenancy
PPP	public-private partnership	TPB	Town Planning Board
RN	Reinstatement Notice	TPO	Town Planning Ordinance (Cap. 131)
RNCP	Robin's Nest Country Park	UD	Unauthorized Development
SAP	species action plan, a document which determines the conservation objectives and actions for a single or multiple species. In Hong Kong, these plans are often formulated and coordinated by AFCD, in consultation with relevant experts and Government departments.	V	Village Type Development, a land use zoning in statutory plans under the TPO, which intends to reflect existing villages and provide land for village expansion.
SSSI	Site of Special Scientific Interest, terrestrial or marine areas of biological and/or geological importance. Some SSSIs are also mapped as a land use zoning in statutory plans under the TPO, which intends to conserve and protect the important features in the SSSI. There is a general presumption against development in this zone.	VU	Vulnerable (IUCN Red List conservation status)
		WSD	Water Supplies Department

REFERENCES

1. Reports on Hong Kong Headline Indicators for Biodiversity and Conservation from 2011 to 2017 were published by the Hong Kong Bird Watching Society. Reports are available at: <https://www.hkbws.org.hk/cms/en/reports>
2. Kilburn, M. & Kemdrick, R. (2011). *Nature Conservation: a new policy framework for Hong Kong*. Civic Exchange. Retrieved from <http://civic-exchange.org/report/nature-conservation-a-new-policy-framework-for-hong-kong/>
3. Information obtained from Town Planning Board through application for access to information. The Statutory Planning Portal 2 was launched on 14 Nov 2014.
4. Office of The Ombudsman. (2018). *Executive summary of the direct investigation into Government's control over fly-tipping of construction waste and landfilling activities on private land* [Full report available in Chinese only]. Retrieved from http://ofomb.ombudsman.hk/abc/files/DI410_ES_E-1_2_2018_0.pdf
5. AFCD. (2020). *Working papers of The Country and Marine Parks Board from 2017 to 2019*. Retrieved from https://www.afcd.gov.hk/english/aboutus/abt_adv/abt_adv_b.html
6. PlanD. (2010). Appendix G – Ecological Field Survey. In *Land Use Planning for the Closed Area*. Retrieved from https://www.pland.gov.hk/pland_en/misc/FCA/frontier_eng/frontier_e1.htm
7. BirdLife International. (2020). *Important Bird Areas factsheet: Inner Deep Bay and Shenzhen River catchment area*. Retrieved from [http://datazone.birdlife.org/site/factsheet/inner-deep-bay-and-shenzhen-river-catchment-area-iba-hong-kong-\(china\)](http://datazone.birdlife.org/site/factsheet/inner-deep-bay-and-shenzhen-river-catchment-area-iba-hong-kong-(china))
8. AFCD. (2020). *List of Priority Sites for Enhanced Conservation*. Retrieved from https://www.afcd.gov.hk/english/conservation/con_nncp/con_nncp_list/con_nncp_list.html
9. Town Planning Board. (2020). *Draft Ma On Shan Outline Zoning Plan No. S/MOS/23*. Retrieved from https://www2.ozp.tpb.gov.hk/plan/ozp_plan_notes/en/S_MOS_23_e.pdf
10. Town Planning Board. (2015). *Approved Mau Ping Outline Zoning Plan No. S/ST-MP/2*. Retrieved from https://www1.ozp.tpb.gov.hk/plan/ozp_plan_notes/en/S_ST-MP_2_e.pdf
11. Noffke, C. and Yip, P. (2014). *Lantau – Hong Kong's Jewel*. Retrieved from https://issuu.com/conservation_lantau/docs/lantau-hong_kong_s_jewel_publish/38
12. CEDD. (2020). *Lantau Development Advisory Committee – Ecological Study for Pui O, Shui Hau, Tai O and Neighbouring Areas (LandAC Paper No. 02/2020 for information on 18 January 2020)*. Retrieved from https://www.devb.gov.hk/filemanager/en/content_876/LandAC_Paper_No_02_2020_Eng.pdf
13. Standnews. (2016, September 27). 環保署准貝澳私人地倒泥頭 梅窩居民申司法覆核 [EPD permits dumping on private land in Pui O, Mui Wo resident seeks judicial review]. Retrieved from <https://www.thestandnews.com/society/環保署准貝澳私人地倒泥頭-梅窩居民申司法覆核/>
14. Lau, C. (2018, September 14). Hong Kong environmental activist loses legal battle to stop Pui O waste dumping. *South China Morning Post*. Retrieved from <https://www.scmp.com/news/hong-kong/law-and-crime/article/2164141/hong-kong-environmental-activist-loses-legal-battle>
15. EPD. (2020). EP-477/2013 - *Development of Lok Ma Chau Loop*. Retrieved from https://www.epd.gov.hk/eia/english/register/aep/ep4772013_content.html
16. EPD. (2013). *Section 1.7 in Part C of the Environmental Permit No. EP-477/2013*. Retrieved from <https://www.epd.gov.hk/eia/register/permit/latest/ep4772013.htm>
17. ACE Secretariat. (2020). *Confirmed Minutes of the 238th Meeting of the Advisory Council on the Environment (ACE) held on 11 November 2019 at 2:30 pm*. Retrieved from https://www.epd.gov.hk/epd/sites/default/files/epd/english/boards/advisory_council/files/ACE-238-minutes-web.pdf
18. Town Planning Board. (2011, July 4). *Town Planning Board adopts approaches to deter "destroy first, build later" activities* [Press Release]. Retrieved from <https://www.info.gov.hk/gia/general/201107/04/P201107040255.htm>
19. Rural and New Town Planning Committee. (2013). 'Agenda Item 3: Y/NE-TK/12'. In *Minutes of 489th Meeting of the Rural and New Town Planning Committee held at 2:30 p.m. on 7.6.2013*. Town Planning Board. Retrieved from https://www.info.gov.hk/tpb/en/meetings/RNTPC/Minutes/m489rnt_e.pdf
20. Town Planning Board. (2017). 'Paragraph 31'. In *Minutes of the 1137th Meeting of the Town Planning Board held on 10.3.2017*. Town Planning Board. Retrieved from https://www.info.gov.hk/tpb/en/meetings/TPB/Minutes/m1137tpb_e.pdf
21. Town Planning Board. (2019). 'Paragraph 18'. In *Minutes of 1206th Meeting of the Town Planning Board held on 9.8.2019*. Town Planning Board. Retrieved from https://www.info.gov.hk/tpb/en/meetings/TPB/Minutes/m1206tpb_e.pdf
22. Town Planning Board. (2018). 'Paragraph 56'. In *Minutes of 600th Meeting of the Rural and New Town Planning Committee held at 2:30 p.m. on 6.4.2018*. Town Planning Board. Retrieved from https://www.info.gov.hk/tpb/en/meetings/RNTPC/Minutes/m600rnt_e.pdf
23. Rural and New Town Planning Committee. (2014). 'Paragraph 53'. In *Minutes of 520th Meeting of the Rural and New Town Planning Committee held at 2:30 p.m. on 17.10.2014*. Town Planning Board. Retrieved from https://www.info.gov.hk/tpb/en/meetings/RNTPC/Minutes/m520rnt_e.pdf
24. Rural and New Town Planning Committee. (2015). 'Paragraph 36'. In *Minutes of 525th Meeting of the Rural and New Town Planning Committee held at 2:30 p.m. on 2.1.2015*. Town Planning Board. Retrieved from https://www.info.gov.hk/tpb/en/meetings/RNTPC/Minutes/m525rnt_e.pdf
25. Town Planning Board. (2017). 'Paragraph 123'. In *Minutes of 1136th Meeting of the Town Planning Board held on 24.2.2017*. Town Planning Board. Retrieved from https://www.info.gov.hk/tpb/en/meetings/TPB/Minutes/m1136tpb_e.pdf
26. Town Planning Board. (2017). 'Paragraph 58'. In *Minutes of 1131st Meeting of the Town Planning Board held on 6.1.2017*. Town Planning Board. Retrieved from https://www.info.gov.hk/tpb/en/meetings/TPB/Minutes/m1131tpb_e.pdf
27. The case was related to STT No. 3116. Land record information retrieved from the Hong Kong Map Services 2.0 at <https://www.hkmapservice.gov.hk/OneStopSystem/home>
28. Black-faced Spoonbill (*Platalea minor*) and Spoon-billed Sandpiper (*Eurynorhynchus pygmeus*) are covered by global species action plans that are applicable to Hong Kong, which are available from: <http://www.cms.int/en/publications/technical-series>. Although there are action plans for the Critically Endangered Christmas Island Frigatebird (*Fregata andrewsi*) and Siberian Crane (*Grus leucogeranus*), it does not cover Hong Kong because it is an extremely rare vagrant (i.e. well outside their normal home range) in Hong Kong. The Kadoorie Farm & Botanic Garden has a conservation plan for Three-banded Box Turtle (*Cuora trifasciata*).

REFERENCES

29. AFCD. (2015). *Committee Paper NCSC 1/2015 – Updates on Species Action Plans and Conservation Measures*. Nature Conservation Subcommittee, Advisory Council on the Environment. HKSAR Government. Retrieved from http://www.epd.gov.hk/epd/sites/default/files/epd/english/boards/advisory_council/files/ncsc_paper01_2015.pdf
30. Information obtained from AFCD through application for access to information.
31. BirdLife International. (2017). *Emberiza aureola*. The IUCN Red List of Threatened Species 2017: e.T22720966A119335690. Retrieved from <http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T22720966A119335690.en>.
32. Jefferson, T.A., Smith, B.D., Braulik, G.T. & Perrin, W. (2017). *Sousa chinensis* (errata version published in 2018). *The IUCN Red List of Threatened Species* 2017: e.T82031425A123794774. Retrieved from <http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T82031425A123794774.en>.
33. BirdLife International (2018). *Pelecanus crispus* (amended version of 2017 assessment). *The IUCN Red List of Threatened Species* 2018: e.T22697599A122838534. Retrieved from <http://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T22697599A122838534.en>.
34. BirdLife International (2018). *Corvus pectoralis*. *The IUCN Red List of Threatened Species* 2018: e.T22706049A131735892. Retrieved from <http://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T22706049A131735892.en>.
35. Fennessy, S., Pollard, D.A. & Samoilys, M. (2018). *Epinephelus lanceolatus*. *The IUCN Red List of Threatened Species* 2018: e.T7858A100465809. Retrieved from <http://dx.doi.org/10.2305/IUCN.UK.2018-2.RLTS.T7858A100465809.en>
36. Jiang, T.L., Feng, J., Csorba, G. & Bates, P. (2019). *Myotis pilosus*. *The IUCN Red List of Threatened Species* 2019: e.T14193A22062554. Retrieved from <https://www.iucnredlist.org/species/14193/22062554>
37. Laurie, K., Chen, C.-P., Cheung, S.G., Do, V., Hsieh, H., John, A., Mohamad, F., Seino, S., Nishida, S., Shin, P. & Yang, M. (2019). *Tachypleus tridentatus* (errata version published in 2019). The IUCN Red List of Threatened Species 2019: e.T21309A149768986. Retrieved from <http://dx.doi.org/10.2305/IUCN.UK.2019-1.RLTS.T21309A149768986.en>.
38. Yang, J. (2019). *Dibamus bogadeki*. The IUCN Red List of Threatened Species 2019: e.T104679625A104679628. Retrieved from <https://www.iucnredlist.org/species/104679625/104679628>
39. AFCD. (2018). Nature Conservation Practice Note No. 05 - Guidelines on the Formulation of Species Action Plan [Ref. AF GR CON 21/2]. Retrieved from https://www.afcd.gov.hk/english/conservation/Con_hksap/bsap_strategy_and_actions/files/NCPN_No.05_Guidelines_on_the_Formulation_of_Species_Action_Plan_v2018.pdf
40. AFCD. (2018). *Incense Tree (Aquilaria sinensis) Species Action Plan 2018-2022*. Retrieved from https://www.afcd.gov.hk/english/conservation/con_flo/con_flo_con/files/Incense_Tree_SAP_2018_2022.pdf
41. Challender, D., Wu, S., Kaspal, P., Khatiwada, A., Ghose, A., Ching-Min Sun, N., Mohapatra, R.K. and Laxmi Suwal, T. (2019). *Manis pentadactyla* (errata version published in 2020). *The IUCN Red List of Threatened Species* 2019: e.T12764A168392151. Retrieved from <https://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T12764A168392151.en>.
42. AFCD. (2019). *Chinese Pangolin (Manis pentadactyla) Species Action Plan 2019-2024*. Retrieved from https://www.afcd.gov.hk/tc_chi/conservation/hkbiodiversity/speciesgroup/files/Chinese_Pangolin_SAP_Dec2019.pdf
43. Convention on Migratory Species. (2017). *Action plan for the Yellow-breasted Bunting*. Retrieved from https://www.cms.int/sites/default/files/document/cms_cop12_doc.24.1.5_ap-yellow-breasted-bunting_e.pdf
44. AFCD. (2000). The Conservation Programme for the Chinese White Dolphin in Hong Kong. Retrieved from https://www.afcd.gov.hk/english/publications/publications_con/files/conpgm.pdf
45. WWF – Hong Kong. (2020, June 1). *WWF releases emergency action plan for Chinese White Dolphin* [Press Release]. Retrieved from https://www.wwf.org.hk/en/news/press_release/?23980/Press-Release--WWF-RELEASES-EMERGENCY-ACTION-PLAN-FOR-CHINESE-WHITE-DOLPHIN
46. LandsD. (2013). *Hong Kong Geographic Data*. Retrieved from <http://www.landsd.gov.hk/mapping/en/publications/map.htm>
47. AFCD. (2017). *Country Parks and Special Areas*. Retrieved from http://www.afcd.gov.hk/english/country/cou_lea/cp_sa.html
48. AFCD. (2015). *Hong Kong Wetland Park Habitat Management Plan*. Retrieved from https://www.wetlandpark.gov.hk/filemanager/files/public/wcms/201507_HKWP_Habitat_Management_Plan.pdf
49. "In 2009-2016, a total area of 50 hectares of exotic plantations in country parks was engaged under the PEP." AFCD. (2017). Country Parks Plantation Enrichment Project. Retrieved from http://www.afcd.gov.hk/english/country/cou_lea/plantation.html
50. "In 2009-2019, a total of 90 hectares of exotic plantations in country parks were engaged under PEP." AFCD. (2020). Country Parks Plantation Enrichment Project. Retrieved from http://www.afcd.gov.hk/english/country/cou_lea/plantation.html
51. Note 30.
52. Deep Bay Ramsar Site (1540 ha), Kwun Yum Shan (managed by KFBG and cover 148 ha), Long Valley (12.5 ha), Deep Bay fish ponds (380 ha) and Fung Yuen Butterfly Reserve (2 ha) are covered by management plans.
53. "Country Park enclaves" are sites surrounded by or adjacent to country parks. In 2010, the Government identified 77 country park enclaves in Hong Kong.
54. AFCD. (2020). *Hong Kong Biodiversity Strategy and Action Plan 2016-2021 Progress of Implementation* [ACE Paper 4/2020 for discussion on 11 May 2020]. Retrieved from https://www.afcd.gov.hk/english/conservation/Con_hksap/bsap_implementation/files/ACE_Paper_4_2020.pdf
55. HKSAR Government. (2017, January 18). *Paragraph 113 of 2017 Policy Address*. Retrieved from <https://www.policyaddress.gov.hk/jan2017/eng/p112.html>
56. AFCD. (2011). *Review of the Criteria for Designating Country Parks and Proposed Measures for Protecting Country Park Enclaves (Country and Marine Parks Board Working Paper: WP/CMPB/6/2011)*. Retrieved from https://www.afcd.gov.hk/english/aboutus/abt_adv/files/common/WP_CMPB_6_2011eng.pdf
57. Country Park Authority. (2019). *Consultancy Study of the Proposed Robin's Nest Country Park – Study Summary and Recommendations (Country and Marine Parks Board Working Paper WP/CMPB/7/2019)*. Agriculture, Fisheries and Conservation Department. Retrieved from https://www.afcd.gov.hk/english/aboutus/abt_adv/files/WP_CMPB_7_2019_Eng.pdf
58. Country and Marine Parks Board. (2019). *Confirmed Minutes of the 70th Country and Marine Parks Board Meeting held on 16 July 2019*. Retrieved from https://www.afcd.gov.hk/english/aboutus/abt_adv/files/Confirmed_minutes_of_the_70th_CMPB_Meeting_Eng.pdf
59. AFCD. (2020). *Non-Governmental Organisations participated in PEP*. Retrieved from https://www.afcd.gov.hk/english/country/cou_how/whats_new_pep.html/pep_part_ngo.html
60. The duties of the Authority under the Country Parks Ordinance [Cap. 208] (i.e. Director of Agriculture, Fisheries and Conservation) for the management of the Country Parks include "to protect the vegetation and wild life inside country parks and special areas".
61. Environment and Conservation Fund. (2020). *Approved Nature Conservation Management Agreement Projects - Rehabilitation project for Sai Wan area*. Retrieved from https://www.ecf.gov.hk/doc/NCMA017_ENG.pdf

REFERENCES

62. HKSAR Government. (2017, June 15). *Non-in-situ land exchange agreed to promote long-term conservation of Sha Lo Tung* [Press Release]. Retrieved from <https://www.info.gov.hk/gia/general/201706/15/P2017061500712.htm>
63. Environmental Protection Department. (2020). *Shuen Wan Golf Course*. Retrieved from https://www.epd.gov.hk/eia/english/alpha/aspd_725.html
64. Green Power. (2020). *Sha Lo Tung Management Agreement*. Retrieved from <https://www.greenpower.org.hk/SLT/eng/agreement.shtml>
65. Note 46.
66. AFCD. (2017). *Designated Marine Parks and Marine Reserve*. Retrieved from http://www.afcd.gov.hk/english/country/cou_vis/cou_vis_mar/cou_vis_mar_des/cou_vis_mar_des.html
67. AFCD. (2017). *Management of Marine Parks*. Retrieved from https://www.afcd.gov.hk/english/country/cou_vis/cou_vis_mar/cou_vis_mar_pla/cou_vis_mar_pla_mppm.html
68. AFCD. (2020). *Designated Marine Parks and Marine Reserves – Southwest Lantau Marine Park*. Retrieved from https://www.afcd.gov.hk/english/country/cou_vis/cou_vis_mar/cou_vis_mar_des/cou_vis_mar_des_swl.html
69. Convention on Biological Diversity. (2020). *Aichi Target 11*. Retrieved from <https://www.cbd.int/aichi-targets/target/11>
70. HKSAR Government. (2019, December 13). *Implementation of new fisheries management strategy in marine parks gazetted* [Press Release]. Retrieved from <https://www.info.gov.hk/gia/general/201912/13/P2019121300662.htm>
71. AFCD. (2020). *Marine Park Permit – Fisheries Management in Marine Parks and Marine Reserve*. Retrieved from https://www.afcd.gov.hk/english/country/cou_vis/cou_vis_mar/cou_vis_mar_mpp/fisheries_management.html
72. Mak, A. (2016, January 19). Court hears green challenge to sale of greenbelt site. *The Standard*. Retrieved from <https://www.thestandard.com.hk/section-news/section/4/165310/Court-hears-green-challenge-to-sale-of-greenbelt-site>
73. HKSAR Government. (2016, June 1). *LCQ19: Promoting modernisation and sustainable development of local agriculture* [Press Release]. Retrieved from <http://www.info.gov.hk/gia/general/201606/01/P201606010529.htm>
74. Rural and New Town Planning Committee. (2020). 'Agenda Item 10: Section 16 Application A/SLC/161'. In *Minutes of 654th Meeting of the Rural and New Town Planning Committee held at 2:30 p.m. on 4.9.2020*. Town Planning Board, North Point, Hong Kong. Retrieved from https://www.info.gov.hk/tpb/en/meetings/RNTPC/Minutes/m654rnt_e.pdf
75. AFCD. (2020). *Boarding Establishment Licence*. Retrieved from https://www.pets.gov.hk/english/animal_business/boarding_establishment_licence.html
76. HKSAR Government. (2011). *Paragraph 43(iv) of 2011-12 Policy Address*. Retrieved from <https://www.policyaddress.gov.hk/11-12/eng/p43.html>
77. HKSAR Government. (2013). *Paragraph 73 of 2013 Policy Address*. Retrieved from <https://www.policyaddress.gov.hk/2013/eng/p73a.html>
78. HKSAR Government. (2018, January 24). *LCQ10: Statistics on and rezoning of Green Belt sites* [Press Release]. Retrieved from <https://www.info.gov.hk/gia/general/201801/24/P2018012400288.htm>
79. Task Force on Land Supply. (2018). *Land for Hong Kong: Our Home, Our Say!*. Retrieved from <https://www.legco.gov.hk/yr17-18/english/panels/dev/papers/dev20180529-booklet201804-e.pdf>
80. HKSAR Government. (2016, January 14). *Government implements New Agriculture Policy* [Press Release]. Retrieved from <https://www.info.gov.hk/gia/general/201601/14/P201601140558.htm>
81. Tai Po District Council Secretariat. (2019). 'Paragraph 3(vii)'. In *(Revised) Minutes of the 1st Meeting of Tai Po District Council in 2019*. Tai Po District Council. Retrieved from https://www.districtcouncils.gov.hk/tp/doc/2016_2019/en/dc_meetings_minutes/TPDC_M1_20190103_Eng_Revised.pdf
82. Development Bureau. (2019). *Terms of reference of Task Force on Land Supply (Appointed from 1 September 2017 to 28 February 2019)*. Retrieved from https://www.devb.gov.hk/en/boards_and_committees/task_force_on_land_supply/terms_of_reference/index.html
83. HKSAR Government. (2018). *Paragraph 68 to 70 of the Chief Executive's 2018 Policy Address*. Retrieved from <https://www.policyaddress.gov.hk/2018/eng/pdf/PA2018.pdf>
84. HKSAR Government. (2020, May 5). *Land Sharing Pilot Scheme opens for applications tomorrow* [Press Release]. Retrieved from <https://www.info.gov.hk/gia/general/202005/05/P2020050500522.htm>
85. CEDD. (2014). *Feasibility Study of Site Formation and Infrastructural Works for Nine Housing Site in Tseung Kwan O* (Agreement No. CE 61/2014[CE]).
86. Information obtained from Drainage Services Department through application for access to information and from the annual publication of "DSD in Brief" retrieved from <https://www.dsd.gov.hk/EN/InformationCorner/Publication/DSDinBrief/index.html>
87. EPD. (2019). *Environmental Impact Assessment (EIA) Ordinance, Cap.499 Application for EIA Study Brief Project Title: Drainage Improvement Works in Ta Kwu Ling (Application No. ESB-322/2019)*. Retrieved from <https://www.epd.gov.hk/eia/register/study/latest/esb-322.pdf>
88. DSD. (2015). *DSD Practice Note No. 1/2015 – Guidelines on Environmental and Ecological Considerations for River Channel Design*. Retrieved from http://www.dsd.gov.hk/EN/Files/Technical_Manual/dsd_TechCirculars_n_PracticeNotes/DSDPN_201501.pdf
89. DSD. (2018). *EcoDMS*. Retrieved from <https://www.dsd.gov.hk/EcoDMS/EN/Home/Home.html>
90. EPD. (2020). *River Water Quality Monitoring in Hong Kong*. Retrieved from <https://www.epd.gov.hk/epd/english/environmentinhk/water/hkwqrc/waterquality/river-1.html>
91. EPD. (2018). *River Water Quality in Hong Kong 2018*. Retrieved from <https://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentinhk/water/hkwqrc/files/waterquality/annual-report/riverreport2018.pdf>
92. DSD. (2009). *Village Sewerage Programme*. Retrieved from https://www.dsd.gov.hk/SC/Files/publications_publicity/publicity_materials/leaflets_booklets_factsheets/Village%20Sewerage.pdf
93. EPD. (n.d.). *Guidance notes on discharges from village houses*. Retrieved from https://www.epd.gov.hk/epd/sites/default/files/epd/english/environmentinhk/water/guide_ref/files/guide_wpc_dv.pdf
94. Audit Commission. (2016). *Sewerage systems in rural areas*. Report No. 67, Chapter 8. Retrieved from https://www.aud.gov.hk/pdf_e/e67ch08.pdf
95. Rural and New Town Planning Committee. (2019). 'Paragraph 53'. In *Minutes of 637th Meeting of the Rural and New Town Planning Committee held at 2:30 p.m. on 1.11.2019*. Town Planning Board. Retrieved from https://www.info.gov.hk/tpb/en/meetings/RNTPC/Minutes/m637rnt_e.pdf
96. Note 94.
97. Lee, W.H. & Chow, K.L.G. (2007). An update on the population control of House Crow *Corvus splendens* in Hong Kong. *Hong Kong Biodiversity – Agriculture, Fisheries and Conservation Department Newsletter, Issue No. 15*, 11-15. (For data in 2007).
98. AFCD unpublished information (2008-2013 data) obtained through application for access to information.

REFERENCES

99. Information obtained through enquiry made to WWF - Hong Kong.
100. Information obtained through enquiry made to the Conservancy Association, Environmental Association, Green Power and WWF - Hong Kong.
101. Legislative Council. (2012, February 1). *Paragraph 14 of the Official record of proceedings (The Council met at eleven o'clock)*. Retrieved from <http://www.legco.gov.hk/yr11-12/english/counmtg/hansard/cm0201-translate-e.pdf>
102. HKSAR Government. (2013, December 11). LCQ19: *Mikania micrantha* [Press Release]. Retrieved from <http://www.info.gov.hk/gia/general/201312/11/P201312110267.htm>
103. AFCD. (2016). *About Mikania*. Retrieved from http://www.afcd.gov.hk/english/conservation/con_flo/About_Mikania/about_mikania.html
104. WWF - Hong Kong. (2013). *Section 9.4.2 of the Mai Po Nature Reserve Habitat Management, Monitoring and Research Plan 2013 - 2018 (Volume I - Habitat Management)*. Retrieved from https://apps.wwf.org.hk/file/MP_Plan_V1_V2.pdf
105. Information obtained through enquiry made to Environmental Association.
106. Note 48.
107. Information obtained through enquiry made to the Conservancy Association.
108. Information obtained through enquiry made to Green Power.
109. AFCD. (2020). *Nature Conservation Practice Note No.01: Clearing Mikania*. Retrieved from https://www.afcd.gov.hk/english/conservation/con_flo/About_Mikania/files/NCPN_No.01_Clearing_Mikania_ver.Aug2020_revised.pdf
110. AFCD. (2020). *Development of a risk assessment protocol for identification of invasive alien species (ACE-NC Paper 2/2020)*. Retrieved from https://www.epd.gov.hk/epd/sites/default/files/epd/english/boards/advisory_council/files/ncsc_2_2020.pdf
111. Anon. (2020). *Monthly Waterbird Monitoring Biannual Report 2 (October 2019 to March 2020), Mai Po Inner Deep Bay Ramsar Site Waterbird Monitoring Programme 2019-20*. Report by the Hong Kong Bird Watching Society to the Agriculture, Fisheries and Conservation Department, Hong Kong Special Administrative Region Government.
112. HKSAR Government. (2018 July 4). LCQ2: Ecological environment of Mai Po and adjacent marshes [Press Release]. Retrieved from <https://www.info.gov.hk/gia/general/201807/04/P2018070400537.htm>
113. HKSAR Government. (2018 August 25). Man sentenced for entering illegally into Restricted Area in Mai Po [Press Release]. Retrieved from <https://www.info.gov.hk/gia/general/201808/25/P2018082500875.htm>
114. HKSAR Government. (2018 March 28). LCQ3: Hill fire at Nam Sang Wai [Press Release]. Retrieved from <https://www.info.gov.hk/gia/general/201803/28/P2018032800544.htm>
115. HKU POP. (2018). 市民對南生圍保育意見調查 [Opinion survey on the general public's view on the conservation of Nam Sang Wai]. Retrieved from https://www.hkpop.hku.hk/chinese/report/nsw_2018/index.html
116. Transport Bureau of Shenzhen Municipality. (2019, September 30). “海上看深圳”项目将航线延伸至深圳湾大桥东部，未来将升级为“海上看湾区” [The project “Shenzhen from the sea” will extend its route to the east of the Shenzhen Bridge and will upgrade to “The Bay Area from the sea”]. *Transport Bureau of Shenzhen Municipality*. Retrieved from http://sso.sz.gov.cn/jw/zwgk/jtzx/gzdt/201909/t20190930_18239399.htm
117. WWF - Hong Kong. (2011 September 30). *WWF-Hong Kong's position on the Fung Lok Wai project*. Retrieved from <https://www.wwf.org.hk/en/news/?5541/WWF-Hong-Kongs-position-on-the-Fung-Lok-Wai-project>
118. SCMP. (n.d.). Activists step up battle against WWF. *South China Morning Post*. Retrieved from <https://www.scmp.com/article/981018/activists-step-battle-against-wwf>
119. WWF - Hong Kong. (2013 May 14). *WWF-Hong Kong Announces its Withdrawal from the Fung Lok Wai Project*. Retrieved from <https://www.wwf.org.hk/en/?9380%2FWWF-Hong-Kong-Announces-its-Withdrawal-from-the-Fung-Lok-Wai-Project>
120. EPD. (2009). *Conditions of Approval for the Proposed Comprehensive Development at Fung Lok Wai at Lot 1457 R.P. in D.D. 123*. Retrieved from <https://www.epd.gov.hk/eia/register/report/conditions/aeiar1482009.pdf>
121. Apple Daily. (2013 November 23). 城規會放生百億豐樂圍住宅項目 長實闖后海灣濕地開殺戒 [Town Planning Board approved the 10 billion Fung Lok Wai residential development, Cheung Kong charged into the Deep Bay wetlands]. Apple Daily. Retrieved from <https://hk.appledaily.com/local/20131123/MQHIBSK6IKVYWWYEBMYMKZFTH4/>
122. Buildings Department. (2019). Monthly Digest for January 2019. Retrieved from <https://www.bd.gov.hk/en/whats-new/monthly-digests/index.html>
123. MingPao. (2018 November 15). 環保觸覺申覆核推翻元朗豐樂圍發展項目 [Green Sense applied for judicial review to turn over the approved Fung Lok Wai development in Yuen Long]. Retrieved from <https://news.mingpao.com/ins/港聞/article/20181115/s00001/1542268946541/環保觸覺申覆核推翻元朗豐樂圍發展項目>
124. Siu, J. (2020, September 5). Court sides with environmentalist against Hong Kong developer that wants to build on globally important wetlands. *South China Morning Post*. Retrieved from <https://www.scmp.com/news/hong-kong/law-and-crime/article/3100364/court-sides-environmentalist-against-hong-kong>
125. EPD. (2020). Proposed Development at Fung Lok Wai, Yuen Long at Lot 1457 R.P. in DD123. Retrieved from https://www.epd.gov.hk/eia/english/alpha/aspd_276.html
126. Hung, K.Y.S. (2013). *Monitoring of Marine Mammals in Hong Kong Waters (2012-13)*. Final report (1 April 2012 to 31 March 2013). Report submitted to the Agriculture, Fisheries and Conservation Department of the Hong Kong SAR Government.
127. Data extracted from the reports on monitoring of marine mammals in Hong Kong waters supported by AFCD. Both the encounter rate and abundance estimates covered four areas: Northeast Lantau (NEL), Northwest Lantau (NWL), West Lantau (WL), and Southwest Lantau (SWL). In previous reports, the total abundance estimate only includes three areas (NEL, NWL and WL) in order to be consistent with the previous dataset (2006 - 2009). However, the latest reports for monitoring of marine mammals in Hong Kong waters derived the abundance in SWL before 2010 from biennial estimates, and they were included in this report for a more comprehensive reflection of the overall trend and situation.
128. Ibid.
129. Anon. (2012). *Summer 2012 Report: Egretty Counts in Hong Kong with particular reference to the Mai Po Inner Deep Bay Ramsar Site*. Report by Hong Kong Bird Watching Society to the Agriculture, Fisheries and Conservation Department.
130. Anon. (2020). *Summer 2019 Report: Egretty Counts in Hong Kong with particular reference to the Mai Po Inner Deep Bay Ramsar Site*. Report by The Hong Kong Bird Watching Society to the Agriculture, Fisheries and Conservation Department, Hong Kong Special Administrative Region Government.
131. Information obtained from AFCD through application for access to information. Data provided by AFCD from their survey records, only the number of species of dragonflies recorded in Hong Kong is available.
132. Sung, Y. H., Hau, B. C. H. and Karraker, N. E. (2014). Reproduction of endangered big-headed turtle, *Platysternon megacephalum* (Reptilia: Testudines: Platysternidae). *Acta Herpetologica*, 9(2): 243-237.
133. The Conservancy Association. (2010). 樹木百科 - 羅漢松 [*Tree encyclopedia - Buddhist Pine*]. Retrieved from http://www.treelovers.org.hk/index.php?tn=tree_buddhist%20pine&lang=tw

REFERENCES

134. HKSAR Government. (2017, February 9). *Transcript of remarks by STH on Hong Kong-Zhuhai-Macao Bridge project* [Press Release]. Retrieved from <https://www.info.gov.hk/gia/general/201702/09/P2017020900740.htm>
135. Hong Kong International Airport. (2016, August 1). *Construction of Three-runway System Kicks Off at HKIA* [Press Release]. Retrieved from <https://www.threerunwaysystem.com/en/information-centre/press-release/01082016/>
136. HKSAR Government. (2018, January 10). CEDD signs contract for Tung Chung New Town Extension - Reclamation and Advance works [Press Release]. Retrieved from <https://www.info.gov.hk/gia/general/201801/10/P2018011000659.htm>
137. RTHK. (2019, August 1). Chinese white dolphin figures reach all-time low. *RTHK*. Retrieved from <https://news.rthk.hk/rthk/en/component/k2/1471938-20190801.htm>
138. Acuity Sustainability Consulting Limited. (2018). Integrated Waste Management Facilities Phase 1 - No.1 Community Liaison Group Meeting Presentation Material. Retrieved from https://iwmfhk.com/en/community_liaison_group.php
139. EPD. (2018). Project Title: Hong Kong Offshore LNG Terminal (Application No. EIA-256/2018). Retrieved from <https://www.epd.gov.hk/eia/register/report/conditions/aeiar2562018.pdf>
140. WWF - Hong Kong. (2017, December 8). Marine Traffic Poses Numerous Threats to Chinese White Dolphin, WWF Study Finds [Press Release]. Retrieved from <https://www.wwf.org.hk/en/?20040/Marine-Traffic-Poses-Numerous-Threats-to-Chinese-White-Dolphin-WWF-Study-Finds>
141. Bird sub-group of Status and Trend and Red List Focus Group. (n.d.). *Status, Trends and Recommendations for Hong Kong Birds*. Retrieved from https://www.afcd.gov.hk/english/conservation/Con_hkbsap/bsap_links_to_resources/files/Appendix_5_Birds_Subgroup_Report_Red_List_FG.pdf
142. Town Planning Board. (2019). 'Agenda item 17: A/ST/969'. In *Minutes of 631st Meeting of the Rural and New Town Planning Committee held at 2:30 p.m. on 2.8.2019*. Town Planning Board. Retrieved from https://www.info.gov.hk/tpb/en/meetings/RNTPC/Minutes/m631rnt_e.pdf
143. EPD. (2020). *Penfold Park Enhancement Project*. Retrieved from https://www.epd.gov.hk/eia/english/alpha/aspd_770.html
144. Note 131.
145. Leung, K.K.K. & Tam, T.W. (2016). Changes/updates to the dragonfly checklist in Hong Kong. *Hong Kong Biodiversity - Agriculture, Fisheries and Conservation Department Newsletter*, Issue No. 24, 16-17.
146. Note 131.
147. AFCD. (2017, October 31). *New Record of Dragonfly Species to Hong Kong: Sympetrum fonscolombii (Selys, 1840)*. Retrieved from <https://www.afcd.gov.hk/english/conservation/hkbiodiversity/news/20171030.html>
148. AFCD. (2018, April 12). *New Record of Dragonfly Species to Hong Kong: Indothemis carnatica (Fabricius, 1798)*. Retrieved from <https://www.afcd.gov.hk/english/conservation/hkbiodiversity/news/20180411.html>
149. AFCD. (2018, October 13). *First Orthetrum albistylum (Selys, 1848) recorded in Hong Kong by Dragonfly Working Group*. Retrieved from <https://www.afcd.gov.hk/english/conservation/hkbiodiversity/news/20181008.html>
150. Graham Reels. (2014). *Sections on odonata in Appendix 9 - Insects sub-group report (under the Status and Trend and Red List Focus Group, Terrestrial Biodiversity Working Group, BSAP Advisory Committee)*. Retrieved from https://www.afcd.gov.hk/english/conservation/Con_hkbsap/bsap_links_to_resources/files/Appendix_9_Insects_Subgroup_Report_Red_List_FG.pdf
151. 東方日報 (2017年10月22日)。〈探射燈：狂徒瘋獵金錢龜 溪澗兩步一籠〉。《東方日報》。取自https://orientaldaily.on.cc/cnt/news/20171022/00176_130.html
152. Personal communication with Dr. Sung Yik-hei on 22 May 2020.
153. KFBG. (2019, June 13). *Animal Stories: A rescued juvenile Big-headed Turtle arrives at KFBG with poachers hook still attached*. Retrieved from <https://www.kfbg.org/en/KFBG-blog/post/A-rescued-juvenile-Big-headed-Turtle-arrives-at-KFBG-with-poachers-hook-still-attached>
154. Personal communication with Dr. Stephan Gale on 5 February 2018.
155. Ecological footprint is defined as the extent of human demand for the renewable resources available on Earth, whereas biocapacity refers to the renewable resources available or the capacity to regenerate the resources demanded.
156. WWF - Hong Kong. (2019). *Hong Kong Ecological Footprint Summary 2019*. Retrieved from http://awsassets.wwfhk.panda.org/downloads/2019_footprint_eng_20190318.pdf
157. Information obtained through enquiry to the Sustainable Development Fund Secretariat.
158. Council on Sustainable Development. (2019). Projects approved in thirteenth round of applications of the Sustainable Development Fund - Sustainable Consumption Behaviour Study. Retrieved from https://www.enb.gov.hk/sites/default/files/susdev/html/en/sdf/sdf_booklet2018_p03e.pdf
159. Mok, D. & Lo, C. (2018, January 23). Two men arrested after Hong Kong police raid exposes 400 mostly endangered animals kept in a house and metal hut. *South China Morning Post*. Retrieved from <https://www.scmp.com/news/hong-kong/health-environment/article/2130242/two-men-arrested-after-hong-kong-police-raid>
160. Siu, J. (2018, November 2). Animal-lover kept endangered species in manner no different from 'slow euthanasia', Hong Kong court told. *South China Morning Post*. Retrieved from <https://www.scmp.com/news/hong-kong/law-and-crime/article/2171476/animal-lover-kept-endangered-species-manner-no>
161. Rural and New Town Planning Committee. (2020). 'Agenda Item 13B: Section 16 Application A/YL-SK/263'. In *Minutes of 642nd Meeting of the Rural and New Town Planning Committee held at 2:30 p.m. on 17.1.2020*. Town Planning Board, North Point, Hong Kong. Retrieved from https://www.info.gov.hk/tpb/en/meetings/RNTPC/Minutes/m642rnt_e.pdf
162. HKSAR Government. (2018, April 23). *Government will phase out local ivory trade and increase penalties on illicit trade in endangered species from May* [Press Release]. Retrieved from <https://www.info.gov.hk/gia/general/201804/23/P2018042000739.htm>
163. HKSAR Government. (2019, February 1). *Hong Kong Customs mounts joint operation with Mainland Customs to combat cross-boundary endangered species smuggling activities (with photos)* [Press Release]. Retrieved from https://www.customs.gov.hk/en/publication_press/press/index_id_2441.html
164. EPD. (2019). *Greenhouse Gas Emissions and Carbon Intensity in Hong Kong*. Retrieved from <https://www.climate.gov.hk/files/pdf/Greenhouse%20Gas%20Emissions%20and%20Carbon%20Intensity%20in%20Hong%20Kong.pdf>
165. Ibid.
166. WWF - Hong Kong. (2010, August 7). *WWF Reveals the Latest Carbon Footprint Data Average Carbon Footprint of Hong Kong Citizen is 13.44 Tonnes, Air Travel to Blame* [Press Release]. Retrieved from <https://www.wwf.org.hk/en/?2560/WWF-Reveals-the-Latest-Carbon-Footprint-Data>
167. Environment Bureau. (2017). *Hong Kong's Climate Action Plan 2030+*. Retrieved from <https://www.enb.gov.hk/sites/default/files/pdf/ClimateActionPlanEng.pdf>
168. Council for Sustainable Development. (2019). *Public Engagement Document for the Long-term Decarbonisation Strategy*. Retrieved from https://www.susdev.org.hk/download/pe_document_e.pdf

REFERENCES

169. HKSAR Government. (2019, June 14). *Public engagement on Long-term Decarbonisation Strategy launched* [Press Release]. Retrieved from <https://www.info.gov.hk/gia/general/201906/14/P2019061400309.htm>
170. HKSAR Government. (2020). *The Chief Executive's 2020 Policy Address*. Retrieved from <https://www.policyaddress.gov.hk/2020/eng/policy.html>
171. EPD. (2020). *Greenhouse gas emissions in Hong Kong by sector*. Retrieved from https://www.climate.gov.hk/files/pdf/greenhouse_gas_emissions_by_sector.pdf
172. CLP Power Hong Kong Limited. (2020, November 10). *CLP Power Freezes 2021 Tariff and Introduces Over HK\$160 Million Worth of Community Support Programmes* [Press Release]. Retrieved from https://www.clp.com.hk/en/Current%20Releases/20201110_en.pdf
173. WSD. (2020). *Floating Solar Power System*. Retrieved from <https://www.wsd.gov.hk/en/home/climate-change/mitigating/floating-solar-power-system/index.html>
174. HKSAR Government. (2017, April 25). *New Scheme of Control Agreements reached with the two power companies* [Press Release]. Retrieved from <https://www.info.gov.hk/gia/general/201704/25/P2017042500763.htm>
175. CLP Power Hong Kong. (2018). *Renewable Energy Feed-in Tariff (Residential Customers)*. Retrieved from <https://www.clp.com.hk/en/community-and-environment/renewable-schemes/feed-in-tariff/feed-in-tariff-residential-customers>
176. HK Electric. (2018, August 28). *Feed-in Tariff Scheme Invites Applications - Other Smart Power Services to Follow* [Press Release]. Retrieved from <https://www.hkelectric.com/en/MediaResources/PressReleases/Pages/Feed-in-Tariff-Scheme-Invites-Applications%e3%80%80Other-Smart-Power-Services-to-Follow.aspx>
177. Rural and New Town Planning Committee. (2019). 'Agenda Item 10: A/NE-TK/649'. In *Minutes of 637th Meeting of the Rural and New Town Planning Committee held at 2:30 p.m. on 1.11.2019*. Town Planning Board. Retrieved from https://www.info.gov.hk/tpb/en/meetings/RNTPC/Minutes/m637rnt_e.pdf
178. Town Planning Board. (2020). 'Agenda Item 4: Further Consideration of Assessment Criteria for Considering Applications for Solar Photovoltaic System made under Section 16 of the Town Planning Ordinance'. In *Minutes of 1226th Meeting of the Town Planning Board held on 3.7.2020*. Town Planning Board. Retrieved from https://www.info.gov.hk/tpb/en/meetings/TPB/Minutes/m1226tpb_e.pdf
179. Town Planning Board. (2020). *Assessment Criteria for Considering Applications for Solar Photovoltaic System made under Section 16 of the Town Planning Ordinance*. Retrieved from [https://www.info.gov.hk/tpb/en/forms/Technical_Doc/Assessment%20Criteria_promulgation%20\(English\)%20\(21.7.2020\).pdf](https://www.info.gov.hk/tpb/en/forms/Technical_Doc/Assessment%20Criteria_promulgation%20(English)%20(21.7.2020).pdf)
180. Rural and New Town Planning Committee. (2020). 'Agenda Item 9: A/TKO/121'. In *Minutes of 658th Meeting of the Rural and New Town Planning Committee held at 2:30 p.m. on 23.10.2020*. Town Planning Board. Retrieved from https://www.info.gov.hk/tpb/en/meetings/RNTPC/Minutes/m658rnt_e.pdf
181. Town Planning Board. (2020). *Broad Development Parameters of the Applied Use/Development in respect of Application No. A/TKO/121*. Retrieved from https://www.info.gov.hk/tpb/tc/plan_application/Attachment/20200707/s16_A_TKO_121_0_gist.pdf
182. Rural and New Town Planning Committee. (2020). 'Agenda Item 12: A/NE-LK/132'. In *Minutes of 659th Meeting of the Rural and New Town Planning Committee held at 2:30 p.m. on 6.11.2020*. Town Planning Board. Retrieved from https://www.info.gov.hk/tpb/en/meetings/RNTPC/Minutes/m659rnt_e.pdf
183. Rural and New Town Planning Committee. (2015). 'Paragraph 35(c)(iii)'. In *Minutes of 544th Meeting of the Rural and New Town Planning Committee held at 2:30 p.m. on 6.11.2015*. Town Planning Board. Retrieved from https://www.info.gov.hk/tpb/en/meetings/RNTPC/Minutes/m544rnt_e.pdf
184. Planning Department. (2020). *RNTPC Paper No. A/NE-LK/132 for consideration by the Rural and New Town Planning Committee on 6.11.2020*. Retrieved from https://www.info.gov.hk/tpb/en/papers/RNTPC/STN/A_NE-LK_132/A_NE_LK_132%20main%20paper.pdf
185. HKSAR Government. (2016, December 21). *Hong Kong's first Biodiversity Strategy and Action Plan announced* [Press Release]. Retrieved from <http://www.info.gov.hk/gia/general/201612/21/P2016122100308.htm>
186. EPD. (2017). *Convention of Biological Diversity*. Retrieved from http://www.epd.gov.hk/epd/english/environment/hk/conservation/policy/convention_bio_div.html
187. AFCD. (2020). *Hong Kong Biodiversity Strategy and Action Plan: Implementation*. Retrieved from https://www.afcd.gov.hk/english/conservation/Con_hkbsap/bsap_implementation/bsap_implementation.html
188. AFCD. (2020). *Hong Kong Biodiversity Strategy and Action Plan 2016-2021 Progress of Implementation (ACE Paper 9/2021 for discussion on 10 May 2021)*. Retrieved from https://www.epd.gov.hk/epd/sites/default/files/epd/english/boards/advisory_council/files/ACE_Paper_9_2021.pdf
189. PlanD and CEDD. (2013). *Information Digest of the North East New Territories New Development Areas Planning and Engineering Study*. Retrieved from https://www.nentda.gov.hk/doc/pe/info_digest.pdf
190. Development Bureau and CEDD. (2020). *Statutory procedure for the planning of the NDAs developments*. Retrieved from https://ktnfln-ndas.gov.hk/en/3-1-1-statutory_planning.php
191. Kao, E. (2016, April 22). One-man show: green groups want Hong Kong government to put more effort into protecting special sites. *South China Morning Post*. Retrieved from <https://www.scmp.com/news/hong-kong/health-environment/article/1937758/one-man-show-green-groups-want-hong-kong>
192. Terrestrial Biodiversity Working Group, Marine Biodiversity Working Group and Awareness, Mainstreaming and Sustainability Working Group. (n.d.). *Biodiversity Strategy and Action Plan - Specific Proposals from Focus Groups*. Retrieved from https://www.hkbws.org.hk/web/eng/documents/conservation_submissions/PublicEngagement/Attachment3_Specific_Proposals_from_Focus_Groups.pdf
193. AFCD. (2020). *Focus Group Reports*. Retrieved from https://www.afcd.gov.hk/english/conservation/Con_hkbsap/bsap_links_to_resources/bsap_links_to_resources.html#Focus%20Group%20Reports

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