Nature Society (Singapore)
Conservation Committee

Nature Society's Feedback on HDB's Tengah Baseline Review

Preamble by Dr Chong Fook Loong, HDB

"This NSS feedback report is based on HDB's Environmental Baseline Study (EBS) report for Tengah town, which was completed in June 2017, and supplemented by NParks' independent Camera Trapping report, which was completed before the first position paper published by the NSS on 3 Aug 2018. HDB and the various development agencies, have been actively engaging nature groups on their development plans for Tengah since 2016. Following these sessions, the agencies have taken the nature groups' feedback into consideration, and are refining their plans. For example, the shepherding and environmental management plans under LTA's Jurong Region Line project are being reviewed following the initial engagement with the nature groups. PUB has also incorporated the nature groups' proposal to relocate the placement of the site office/storage areas to a less heavily forested area in the latest implementation plans for the High Ground Service Reservoir.

Following HDB's EBS which was completed in 2017, HDB is currently carrying out a more detailed environmental impact study (EIS) prior to the next phase of development. The EIS has been in progress since Dec 2019 and is expected to be completed around the 2nd quarter of 2021. HDB will continue to engage the nature groups and share the findings when ready."

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A) **Introduction**

This is Nature Society, Singapore (NSS)'s Feedback as a result of the Society's representatives' (Leong Kwok Peng and Ho Hua Chew) careful examination of the document presented on 7th August 2019 at the HDB Hub. This feedback supplements the earlier feedback submitted to the HDB and other relevant authorities on 3 August 2018 --- entitled, 'Nature Society Singapore (NSS)'s Position on HDB's Tengah Forest Plan'. The current feedback also covers NSS' response to the latest HDB's comments on the proposed role of Tengah Nature Way, as a national scale green corridor between the Western Catchment Nature Area (WCNR) and the Central nature reserves (BTNR & CCNR) that was published in **The Straits Times** (8 October 2019: 'BTO project causing disruption to Bukit Batok wildlife corridor').

B) Biodiversity/Ecological Importance of Tengah Forest

1) Summary of HDB Baseline Report

The HDB baseline's wildlife inventory has affirmed NSS' position that the Tengah Forest is a highly important landscape for Singapore's wildlife, forming an ecological node and corridor across the geographical east-west spectrum of our national biodiversity.

The HDB's baseline shows that there are at the least 33 species of plantlife with "conservation significance" --- about 12.3 % of the total known records --- of which 2 are regarded as extinct, 19 critically endangered, 4 endangered and 12 vulnerable. In terms of fauna (birds, mammals, reptiles, amphibians, fish, butterflies, odonates), at least 44 species of the 262 total records (17 %) are nationally threatened, and 60 species (23 %) are regarded as forest dependent species, with 43 for birds, 4 for mammals, 3 for reptiles, 7 for butterflies and 3 for odonates. These records are very impressive for a secondary forest patch located about 3-4 km away from the main forested heart of Singapore, the Central nature reserves.

Regarding the Baseline report, we are disappointed and strongly concerned with a lack of any attempt to identify and map the nesting sites of the important/threatened birdlife which are more visible compared to other taxa. We are aware that there is a nesting site of the nationally endangered Changeable Hawk-eagle at Tengah Forest and have indicated its location on an Albizia tree to HDB and NParks, but its significant presence in the Tengah Forest has been ignored and the site cleared without consultation with us.

2) NParks' Camera Trapping Report

The results of the HDB's Baseline Study has been supplemented with the results from NParks' derived from its Camera Trapping Report (16 March 2017). The results add to the ecological significance of Tengah Forest especially with the confirmed presence of the **Sunda Pangolin, with a young** --- a Critically Endangered mammal species not just at the national, but also at the global level. The presence of the young animal

reveals that Tengah Forest is not just a foraging ground for the species but most notably a breeding ground as well.

It is also important to note that there is a record of the **Sunda Pangolin at the edge (nearer to Bukit Batok Road) of the neighbouring Pavilion Park** housing estate which is on the Bukit Gombak sector, (personal comms from Steven Chong, a resident & member of NSS' Butterfly & Insect Group) --- highlighting the need for the animal to disperse across roads (e.g. Bukit Batok Road) for foraging and home-seeking. Recently there is also a record of a **Sunda Pangolin attempting to cross the canal along the Rail Corridor on the Bukit Timah Road flank of Bukit Gombak**, more specifically at the wooded belt adjacent to the MINDEF fence and the Phoenix housing estate and behind the Murugan Hill Temple (personal comm. from Ulf Remahl, an NSS member, dated 21 December 2019; see his photo of the animal below).

Also, NParks' camera trapping records have revealed that Tengah Forest is also used by a number of rare migratory species, including but not limited to:

a) Malayan Night Heron;
b) Orange-headed Thrush;
c) Hooded Pitta; and
d) Slaty-legged Crake.

The non-exhaustive (and short term) nature of these camera-trapping surveys by the authorities strongly suggests that wider surveys are expected to further discover species of interest, including rare migratory species.

C) NSS' Critical Comments on HDB's Master Plan for Tengah Forest

1) Identified Areas of Conservation Significance

There are two areas of "conservation significance" identified in the Baseline study:

a) at Brickland sector around the watertank area; and
b) at west of Brickland/Peng Siang Canal, a larger area.

Despite highlighting these two areas of "conservation significance" given that there have a relatively high diversity of plant species, the design plan as far as we are aware has not designated them for protection against any development in any way in the setting up of the Tengah Forest Town. A "Central Park" has been designated for the Forest Town; it appears that this park would have little value for biodiversity conservation, given that it does not overlap with any of the significant hotspots for biodiversity we have identified in the Tengah landscape!

2) Significant Large Trees

The Baseline has also marked out the number of "significant large trees" in the Tengah landscape, which amounts to 159, of which 90% individual trees belong to the fig family (Moraceae). While the information is no doubt valuable, we do not see what is the usefulness of this information going forward given that there is no clear next-step in how these ecologically important trees will be conserved. Many questions and uncertainty remain. Will it be to save some or all of these trees? If some of them will be saved, how many and which are the trees to be saved? Being mainly of the Ficus genus, we would expect the older and larger specimens to be set aside to enhance the greenery of the HDB landscape after the planting of new vegetation and also to provide food for the wildlife (especially the birds) that remain or to attract to the Forest Town from the neighboring forests (e.g. at the Western Catchment, Bukit Gombak).

3) Tengah Forest is also the Home of Wildlife

The collective evidence, based on HDB's Baseline study, NParks' camera trap monitoring and NSS' bird surveys, demonstrates that the Tengah landscape is rich with flora and fauna to be treated as merely a transit lane or corridor for wildlife movement and dispersal. While the creation of the 5-km Tengah Nature Way along the Kranji Expressway and down the Peng Siang Canal to facilitate wildlife movement and dispersal is highly pertinent and laudable, we view this as a limited move to conserve the important wildlife in Tengah Forest. This point has been presented in our feedback presented to HDB and the relevant authorities, (dated 3 August 2018), where two core areas are proposed as home-grounds for the existing forest/woodland wildlife and/or resting-refuelling areas for those on the long-distance movement, (refer to **Map 1** below). Although Tengah Nature Way has a width of 100 metres all along the corridor, it is expectedly elongated and narrow in shape, lacking in **interior space** and will be strongly subjected to 'edge effects' (disturbances/ disruptions like dehydration, invasion of urban domestic species e.g. rats and cats, etc.) For forest-dependent species, it is not a congenial sort of habitat for them.

a) Globally Threatened Species: Four (4) of the total bird species recorded are globally threatened, that is, listed in the **IUCN Red List.** And these are:

(NT = Near-threatened; CR = Critically Endangered; VU = Vulnerable, F = Forest))

1) Grey-headed Fish Eagle --- NT(F)
2) Blue-rumped Parrot ------ NT(F)
3) Straw-headed Bulbul ----- CR (F)
4) Long-tailed Parakeet. ----- VU(F)

Protection of their forest habitat on Singapore's part would be a big contribution on a global scale to the long-term survival all these four species. Three (3) of these four (4) are also listed in the **Singapore Red Data Book** (**SRDB,** 2008).

b) Straw-headed Bulbul: Of special importance for the global conservation effort is the case of the Straw-headed Bulbul. Across much of its distribution range, i.e. Southeast Asia, the Straw-headed Bulbul has been relentlessly trapped and sold in the bird markets of Java, Kalimantan, Sumatra and Peninsular Malaysia. It is now extinct in Thailand and parts of Indonesia, including the whole island of Java, while also in decline in Malaysia. A recent study by the Bird Group "estimated that the population of the Straw-headed Bulbul for the whole of Singapore to be at least 202 individuals in 2017 … distributed over multiple forest patches", making Singapore the single most important stronghold for the species in the world (Yong *et al* 2018). As a Party to the Convention on Biological Diversity, Singapore holds international obligations to deliver on its National Biodiversity Strategic Action Plan (NBSAP), in particular, to conserve and enhance biodiversity at the genetic, species and ecosystem levels and in alignment with the broader principles to ensure that considerations on biodiversity and ecosystems are factored into the national planning process.

Straw-headed Bulbul

c) Important Forest-Dependent Bird Species: The Baseline Study has also listed some important forest-dependent bird species that are considered as likely to have used the Tengah Forest as a corridor for movement to forests outside the area and these are:

a) Blue-crowned Hanging Parrot

b) Banded Bay Cuckoo
c) Violet Cuckoo
d) Glossy Swiftlet
e) Grey-rumped Treeswift
f) Blue-eared Kingfisher
f) Hill Myna.

In general, we have no issues with this list, but would like to point out that some of these bird species such as the Grey-rumped Treeswift and the Blue-eared Kingfisher, could have established populations here and not merely use the landscape as a transient stopover on the way somewhere. The Blue-eared Kingfisher could have found congenial the many streams flowing through parts of the forest.

d) Nationally Threatened Bird Species: Apart from these, the following important bird species --- as listed in **The Singapore Red Data Book** (**SRDB**, 2008) and recorded in the Baseline Study --- that are reasonable candidates to have colonized or settled into the Tengah area are:

a) Buffy Fish Owl
b) Red-legged Crake
c) White-rumped Shama
d) Red Junglefowl
e) Straw-headed Bulbul
f) Oriental Magpie Robin
g) Grey-headed Fish Eagle
h) Changeable Hawk-eagle (for which we have a nesting record).

e) Uncommon Resident Bird Species: Apart from these threatened bird species now listed in **SRDB,** we have recorded 13 uncommon resident bird species with 7 that are at the least forest dependent and that have settled into the area --- this, given that they are not species that are likely to range far and wide for their sustenance, namely:

a) Abbot's Babbler
b) Greater Coucal
c) Banded Bay Cuckoo
d) Plaintive Cuckoo
e) Emerald Dove
f) Rufous-tailed Tailorbird
g) Rufous Woodpecker.

f) Migratory Bird Species: At the transboundary scale, what is also of ecological significant is the use of the forest here as a second-home/refuge or refuelling station for migratory birdlife coming every year from the northern reaches of East and South–east Asia. From our records combined with that from the HDB Baseline Study as well as from NParks' camera trap monitoring, we have at the least 28 species of

migratory bird using the area for their sustenance. Among these are many that are forest-dependent species, including but not limited to:

a) Black Baza
b) Oriental Honey-buzzard
c) Chestnut-winged Cuckoo
d) Ashy Minivet
e) Tiger Shrike
f) Orange-headed Thrush, and
g) Hooded Pitta, etc.

g) Other nationally important/threatened wildlife that are likely to be settlers in the area rather than being mere passengers are :

a) Greater Bamboo Bat
b) Common Palm Civet
c) Green-crested Lizard
d) Puff-faced Water Snake, and also,
e) Sunda Pangolin

h) Sunda Pangolin: This is a critically endangered mammal species at the national and global level (in **IUCN Red List**), as mentioned above recorded in the Tengah forest by NPark's trap camera with a young, as well as a couple of unconfirmed reports there of the species from nature lovers. As also mentioned above, there is also a record at the Pavilion Park housing estate (2012) at the southern periphery of the HDB planning area (personal comm., Steven Chong, a resident there) as well as most recently at the eastern flank of Bukit Gombak near Phoenix Park (personal comm., Ulf Remahl, December 2019). The fact that the animal is found lost in the housing estate reveals that this globally endangered species is very much extant in the Singapore's remaining countryside and forest patches outside the Central nature reserves --- this one being most probably displaced from its natural habitat due to development disturbances and seeking a new home-ground. **Together with the four globally threatened bird species (especially the Straw-headed Bulbul and Long-tailed Parakeet) mentioned above, the presence also of the globally endangered Sunda Pangolin renders the Tengah Forest an area of high importance for conservation attention.**

Sunda Pangolin found at Pavilion Park, Bukit Gombak area, off Bukit Batok Road (Photo from Steven Chong, 2012)

Sunda Pangolin at Canal on the eastern flank of Bukit Gombak
(Photo from Ulf Remahl, 2019)

Given these considerations, we view any attempt to carry out the **shepherding of the existing wildlife ultimately a rather dead-end or futile exercise** --- as natural habitats especially natural forest/woodland are rapidly diminishing and whatever wildlife that are affected by developments are being squeezed into more and more limited green areas. We of course cannot save every wildlife that exist at the Tengah Forest area but there should be an attempt to cater to the long-term survival of at least many important species as possible by identifying and implementing '**core area (s) of habitat'** into the design plan --- **which we have proposed (for two such core habitats,** refer to **Map 1)** with justifications in our feedback proposal, dated 3 August 2018.

4) 'Jurong Innovation District' as an Interim Core Area

We understand that this area which is planned for an 'Innovation District' is currently designated to serve temporarily as a refugia for the wildlife at Tengah that are being shepherded from the cleared areas. We notice that the LTA project for the MRT Depot/ Station on the Old Jurong Road flank has sliced significantly into this area**. We strongly urge that what remains of the forested area here be left untouched, and be retained as an interim core area for biodiversity in the Tengah landscape** for as long as possible, and until there is an absolute need for its development. Over time, this will help to mitigate the damaging effects of habitat fragmentation on biodiversity. The shepherding works currently being implemented over several phases in other portions of the Tengah landscape is expected to have driven much of the wildlife into this last remaining patch of secondary forest on the western flank of the wider Tengah landscape; and unfortunately, what that remains on the eastern flank --- along the Peng Siang Canal and the Brickland flank --- will imminently be disturbed by the development of the PUB water-tank and LTA work-station for the MRT Line.

As outlined in our earlier feedback, this core area at the western sector, designated by us as 'Core Area A', (refer to **Map 1** below given in the earlier feedback), but now much lesser in extent given the current LTA's MRT development here, can also serve

as an important beach-head and refuge for wildlife that is dispersing out of the forest landscapes in the Western Catchment across the Kranji Expressway to Tengah. In view of its ecological importance, we hereby urge the authorities overseeing the development of this area to undertake a BIA/EIA prior to any possible development plan --- with the main objective to determine an ecologically significant area-size and configuration for a permanent core wildlife area in the 'Innovation District' patch and to integrate it to the wider Tengah landscape and the Tengah Nature Way.

Map 1: Two Wildlife Core Areas proposed in the Earlier Feedback (2018)

5) Regional Connectivity for Tengah Nature Way

We welcome HDB's recent efforts to open discussion on the issue of connectivity for the Tengah Nature Way (on 29 August 2019) in the session with various biodiversity stake-holders on the development at Bukit Batok West. Here, because of the dense HDB blocks present, connectivity south-eastwards to the Bukit Batok Nature Park and the central nature reserves will be extremely problematic and limited. Suggestions for forging a connectivity were mooted with the basic proposal to create a link along Bukit Batok Avenue 2 using the existing uncovered southerly canal to connect in a south-easterly direction through the dense HDB precincts. **But the connectivity to Bukit Batok Nature Park is rather limited in extent.**

Here we urge that --- in addition to the greening of the uncovered canal along Bukit Batok Avenue 2 to its limited extent --- whatever green patches that are

extant in the Bukit Batok housing estate should nevertheless be conserved as they form an important and useful series of stepping stones for wildlife movement and dispersal --- in particular for certain bird species that are typically capable of flying long-distance at one go in their dispersal or search for food (e.g. hawks and eagles, parakeets, pigeons, etc.). Unfortunately, with the many busy roads bisecting these green patches, it is daunting and perilous, if not impossible, for the many birds that are short-distance flyers (e.g. the babblers, coucals, tailorbirds, bulbuls, etc.) and wildlife that are ground-moving or have to get to the ground to cross roads (e.g. Sunda Pangolin, Long-tailed Macaque, Common Palm Civet, Box Terrapin, Wild Pig, Green Crested Lizard, snakes, amphibians, etc.).

However, even if we are able to forge a pathway for the ground-moving wildlife through the dense housing blocks along the roadsides or canals of Bukit Batok , the connectivity will be certainly tenuous and fraught with the possibility of human-wildlife interaction that have been reported in many areas of Singapore. We should as such avoid wherever possible luring wildlife into or through a situation that will likely to generate unpleasant encounters between humans and ground-moving animals in particular (like road-kills, poaching, disturbances to community that dislike or fear them for whatever reason, etc.)

Therefore, we here urge that there should also be exploration and consideration of an alternative fruitful route or direction for the connectivity of the Tengah Nature Way at this extremely problematic eastern sector. As was highlighted in our feedback to HDB earlier, **we recommend that we should forge a link to Bukit Gombak to establish this connectivity to Bukit Batok Town Park and ultimately to Bukit Timah Nature Reserve.**

D) The Connectivity to Bukit Gombak & the Nature Reserve

Refer to the **Map 2** below.

There are three major considerations for advocating this more easterly route --- although much longer compared to the direct easterly route to Bukit Batok Nature Park:

1) It traverses through a more green or less urbanized area and therefore avoids the sort of obstacles and disturbances for wildlife that come with a pathway through a densely urbanized zone.

2) It will generate much less of the possible human-wildlife conflicts that are reported in many areas of Singapore where housing has taken over all or a greater part of natural habitats.

3) **Our preference for this route is bolstered by the fact that there are at least two cases of the critically endangered Sunda Pangolin being found or sighted at the boundary of Bukit Gombak Forest area** --- as mentioned above, one at the edge of Pavilion Park at Bukit Batok Road and the other near Phoenix housing estate at the Bukit Timah side of MINDEF/Bukit Gombak ---- apparently being loss or finding its way to a better patch of greenery. **NSS has also records of the presence of the Straw-headed Bulbul within and along the periphery of the Bukit Gombak Forest.**

Map 2: NSS' Proposed Tengah Nature Way Connectivity to Bukit Gombak & the Nature Reserve (given eco-paths through MINDEF fence are disallowed)

Please note that the eco-links to be forged here are slightly changed/revised from that presented in the earlier feedback, 2018. Here we are only presenting a general idea or thrust for the connectivity to Bukit Gombak and the nature reserve, which of course need to be worked in more detail if acceptable.

Here there is need to forge two eco-links --- one across Bukit Batok Road and the other across Bukit Batok West Avenue 5 --- as well the Hillview gap along the Green Rail Corridor track.

1) That across Bukit Batok Road is to link up Tengah Forest at the eastern end to the remaining woodland patch (used by the Home Team as training ground) at the junction of Bukit Batok Road and Bukit Batok West Avenue 5. Here it is recommended that an overhead wildlife bridge be established.

2) From there, across Bukit Batok Avenue 5 --- to link up to the Gombak sector at the grassy patch to the south of Pavilion Park. Because of the MRT line running along Avenue 5, which acts as a sort of barrier, a wildlife tunnel here is necessary to facilitate the movement of wild animals.

3) The small gap caused by the dismantling of the rail bridge at Hill View Road should be plugged by creating a small bridge for both wildlife and rail-corridor users.

4) The existing rail bridge over Upper Bukit Timah Road just north of Hume Avenue should be enhanced to make it attractive for wild animals to cross.

What is critical at this stage for a smooth pathway connecting Tengah Forest to Bukit Gombak is to ensure that :

1) The development of the service reservoir on the hillock at the extreme southern end of the forest doesn't cause an excessive blockage of access from the Peng Siang Canal to the crossing at the north-eastern side across Bukit Batok Road. That is why a core area in this sector is important and necessary, as is proposed in our earlier feedback.

2) The small patch of forest at the junction of Bukit Batok Road and Bukit Batok Avenue 5 be preserved.

3) The development of a recreational park --- currently being implemented --- between Pavilion Park and the HDB housing estate along Bukit Batok Avenue 5 should allow for a belt of woodland to serve as a corridor through the Park to the edge of the Gombak Forest. It is most encouraging to see that a belt of trees has recently been planted at the grassy patch to the south of Pavilion Park that will assist in promoting the connectivity in this direction --- if this route is also forged for the Tengah Nature Way's connection to Bukit Batok Town Park and the central nature reserves.

4) If eco-holes for the passing of animals that are blocked by the MINDEF fence are not allowed, a belt of woodland and shrubs should be planted along the stretch of grassy slope outside the fence all the way to Bukit Batok Town Park for animals to move southwards to Bukit Batok Town Park and from thence to the Rail Corridor and ultimately to the Bukit Timah Nature Reserve.

E) Concluding Remarks

Here we present our position on what is needed to better contribute to the design and establishment in Singapore of its first "Forest Town" through a conscientious application of the ecological principles to the planning process --- the result of which we can be genuinely proud of in this age of the climate-change emergency and horrendous biodiversity degradation and loss. The Tengah Nature Way is the culmination of the first ever large-scale scheme to promote ecological connectivity, guided with ecological principles, in our town planning processes and we are certainly heartened by this bold plan, but given the rich biodiversity that exists at Tengah Forest, more should be done in terms of biodiversity protection for both resident and migratory species through the setting aside of some parts of the forest as core habitats. As connectivity is also a key to biodiversity conservation, we are proposing an urgent consideration of a fruitful alternative route compared to what has been mooted so far by the relevant authorities. Here setting aside green spaces for a possible route is of the utmost importance for any implementation of a smooth and fruitful connectivity. However, this cannot be achieved without the coming together of the various authorities from the different sectors --- be this planning, military, transport, housing, industrial --- to make this laudable project a shared goal and a successful one for the world to see and emulate.

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