A) Introduction

Nature Society Singapore (NSS) ‘s critique of the Master Plan here will be based on the EIA results pertaining to the biodiversity provided by MSPH. We have no quarrel with the EIA regarding the survey results reported. It is thorough and well-done, but we find the EIA’s conclusion regarding the impact of the projected plans highly questionable. It states that “… the majority of the impacts can be reduced to a residual impact magnitude of small or below”. This general conclusion on impacts leaves open the question of whether there are some impacts that cannot be reduced to this level (“small or below”). What are these impacts? How serious are they? These are not made clear in the report.

We have already provided a feedback report on the ecological /biodiversity issues to Singapore Tourism Promotion Board when an eco-tourism plan was first mooted by the Board in 2007. The plan is now revived in 2014 with a concept masterplan put up by a planning-committee under the auspices of Mandai Safari Park Holdings, followed by the release of the current EIA results.

The current Masterplan is new to us to a large extent insofar as there is the plan to relocate the Jurong Bird Park to the project area, where it will be expanded with the intention of making it the largest bird park in the world. The plan to have also a rainforest park (called “Rainforest Park North”) outside the Safari Park’s existing boundary is also surprising given that it will be somewhat like an extension of the existing Wildlife Reserves Singapore (WRS)’s Night Safari Park. The plan to have a second rainforest park similar to Rainforest Park North (called “Rainforest Park South”) within the WRS’ boundary is also a new item for us, but here we are not taking issue with it, although a big patch of the natural forest that is still extant within WRS’ territory will be almost wiped out.

B) Rationale of NSS Critique

Given the results of the EIA on the biodiversity present/recorded in the project area, our position with respect to the above critique and objections is based on:

1) The belief that for MSPH’s project is an eco-tourism project with ecological binding principles as a basis for its concept and implementation, otherwise spending such a huge sum of money for conducting a full EIA would not make sense. We, the wider public as well as the international community, have been
given this enlightened view of the whole project being embedded in a serious ecological dimension as demonstrated in the promotional brochure being put out recently. WRS is currently carrying out some highly important captive-breeding programmes for endangered species such the Bali Starling and the Sunda Pangolin and has also recently launched a conservation strategy to secure the future survival of the Raffles’ Banded Langur (Leaf-banded Monkey). This is highly praiseworthy and has raised the world stature of the Wildlife Reserves as a conservation-oriented Zoo.

2) On ecological principles and considerations with respect to the adverse impacts on the existing natural habitats (forest, grassland & freshwater) and its rich wildlife --- within the project areas as well as to the bordering Central Catchment Nature Reserve (CCNR). The CCNR forest is seriously in bad ecological shape due to severe fragmentation over the decades caused by the creation of golf courses, roads, pipelines, expansion of the existing reservoirs, etc. What we have now is what ecologists call ‘habitat islands’ rather than one homogeneous, contiguous and compact forest. Fragmentation brings about population isolation among the various species as well as the well-studied phenomenon of the edge-effects. In fact, the CCNR is now fragmented into very roughly seven patches, each standing in isolation from the rest through gaps in the forest cover, resulting in poor habitat connectivity for the forest wildlife. We have emphasized this in our feedback submitted to STB in 2007.

What is of most serious concern to us is the huge gap to CCNR in this northwestern section of the Nature Reserve’s official boundary, where only a thin (almost negligible line) of forest-belt exists as official connectivity between the sectors on both sides of the Mandai Lake Road. We foresee that the current MSPH’s Concept Plan will cause deleterious impacts on this strip of forest. It is true that the project area is once former farmlands but it must be not forgotten that what is prior to this is original rainforest.

This large gap has been ameliorated greatly when farmlands were phased out and wild vegetation regenerated, forming secondary forests as well as some grassland patches that have attracted a rich and diverse resident population of wildlife, many of which are threatened at the global and national levels, as shown in the EIA (e.g. Sunda Pangolin, Lesser Mousedeer, Horsfield’s Flying Squirrel, Malayan Box Terrapin).

This regeneration of wild vegetation and habitats with their concomitant use by wildlife such as for foraging, breeding and roosting, invoke great optimism and ecological sympathy for the long-term viability of our CCNR and its wildlife --- for without putting in any funding and resources the problem of an undesirable ecological gap there has been naturally rectified over time. This is in line with the very laudable efforts of our authorities to improve forest connectivity within the nature reserves, for instance, designating non-reserve nature areas as buffers such as the Chestnut Nature Park and the Thomson Nature Park, the incorporation of the Hindhede Quarry and the establishment of the Dairy Farm Nature Park with respect
to the Bukit Timah Nature Reserve (BTNR). In view of all these ecologically progressive decisions and actions, we expect similar efforts coming out from the MSPH’s Concept Plan.

C) Critique of the EIA Summary of Impact Assessment (Table 11.1, p.11-1, EIA Main Chapters)

Here we would like to focus on four related issues pertaining to the ecological impacts and EIA conclusions drawn on the biodiversity recorded in the project areas and their answers /conclusions provided by the EIA document:

1) Impact on ecological resources due to clearing of vegetation and habitats.
2) Impact on ecological resources due to disturbance and displacement of fauna.
3) Impact on ecological resources from Restriction to wildlife movement.
4) Impact on ecological resources from edge effects on habitats.

We cannot accept all the EIA assessments on the above issues with the exception to (2), where only ‘the magnitude prior to mitigation’ (here graded as ‘large’) is acceptable. What is most disappointing and has caused us to reject the impact magnitude assessments mentioned above is that there is no attempt to provide quantitative assessment of the items evaluated, e.g. percentage loss of natural habitats in relation to what are currently present or the local population of species that are uncommon and/or threatened in relation to baseline data to establish whether the loss would be a significant component of the national and/or the global population. The magnitude ranking ---“large, medium and small” --- lacks objectivity.

1) Impact on ecological resources due to clearing of vegetation and habitats.
EIA Conclusions: Magnitude Prior to Mitigation --- medium
   Residual Impact Magnitude ------ small

EIA’s response to Issue 1 states: “Both the forest and grassland habitats within the projected area will be permanently lost, impacting species reliant on these habitat types” (Table 8.37, p. 8-104). The quantitative magnitude of the clearance/destruction in terms of habitat type within the project area is given in the EIA report as follows (ref. Table 8.37, p. 8-104, EIA Main Chapters):

Lost Secondary Forest ------------------------- 214,995 m² = 21.5 ha
Lost Grassland ------------------------------- 64,987 m² = 6.5 ha
Lost Forested Freshwater Habitat -------------- 4,661 m² = 0.5 ha
Lost Total in hectares ------------------------ 28.5 ha

NSS Response/Comments:
A quantitative assessment of the impact in terms of the loss of natural habitats should include the total area of such habitats already existing within the project area. Without this information, the data on areas lost is meaningless and misleading.
What is also crucial for such an assessment here is the baseline for the project area. Ecologically, the baseline should be restricted to the project parcels where the areas are not already in use and are more or less natural (without any man-made structures). Here, excluding the already developed Zoo territory, the following new development parcels will be pertinent:

a) Bird Park,
b) Rainforest Park North Parcel, and
c) Rainforest Park South.

What is the percentage loss of natural habitats in terms of what is already there in these parcels? What is highly important in the parcels are the forest and the forest freshwater habitat. The loss for these two natural habitats should be of central focus here in such assessment but we do not find these in the EIA report.

If we just focus on the forest habitat for the three parcels highlighted above, on a rough estimate based on the spread (unfortunately no specific area-size is given in the EIA), of the structures and forest-depleting changes (e.g. artificial ponds, aviaries, netted enclosures, etc.) in the concept-plan maps, we expect such loss to be at least around 80-90 % for the Rainforest Park South Parcel, 70 -80 % for the Bird Park Parcel, and 40-50 % for the Rainforest Park North Parcel. The value of what remains as a natural habitat depends among other things on its naturalness and its landscape-ecological situation.

In the case of the forest habitat, whatever is already existing in the Bird Park Parcel is of utmost concern, as it serves to facilitate forest wildlife movement or dispersal across the big gap in this northwestern sector of the CCNR. Given the Bird Park project here, a rough estimate shows that about 20 - 30 % of natural forest habitat will be left after development in that Parcel. And this in a situation where it will be severely fragmented and subjected to severe disturbances when the Park is in operation. Here the magnitude loss of about 70 -80 % will be extremely large (Issue 1). The forest here being in an ecologically strategic location as a wildlife corridor or stepping stone, we do not see how it can be accordingly small in residual impact --- even if the trees be left standing or increased by planting within the Park’s in-flight enclosure.

2) Impact on ecological resources due to disturbance and displacement of fauna.
EIA Conclusions: Magnitude Prior to Mitigation --- large
Residual Impact Magnitude ------- small

For this issue, the EIA reports as follows: “ The magnitude of impact to species from disturbance and displacement due to site clearance is considered to be large within the Project Vicinity. The impacts will affect resident populations of species within the Project area at sufficient scale to cause a substantial change in abundance and/or change in distribution to species within the Project Vicinity prior to construction without mitigation. Less mobile species/species with a small range
such as the Lesser Mouse Deer (Tragulus kanchil); Malayan Colugo (Cynocephalus variegatus) and Sunda Pangolin (Manis javanica)) are of particular concern. Ground dwelling fauna will be permanently excluded from the Project area during operation. Avifauna, invertebrates and some herpetofauna will have access to the Project area during construction and operation. Extant species within the candidate refuge areas will be impacted by fauna displaced from the Project area through resource competition and conflict” (Table 8.5.6.2, p. 8-121, EIA Main Chapters).

**NSS Response/Comments:**

Displacement/disturbance with respect to wildlife is caused by a loss or curtailment or degradation of habitat. If quantifiable, any magnitude assessment of any such adverse consequences of about 50% or above will be to say the least large. Here, the EIA report gives the impact magnitude prior to mitigation as large, but we are not given any sort of quantifiable estimate of this. Thus, we find that the EIA’s conclusion that the residual impact magnitude will be small is beyond comprehension.

If loss here is in terms of at least 50% loss of habitats, where resources for well-being and survival are at stake for the wildlife, then for the 199 species recorded (as given in the EIA, 23 mammal species, 123 bird species and 53 herpetofauna species), with their respective existing populations, will be cramped into what is left (say about 50% or less) of the available habitats after development. What is worst is that the existing wildlife will be shepherded into refugias (buffer areas contiguous to the nature reserve), as stated in the EIA report, to await the completion of construction and regeneration of available habitats, but it is obvious that while waiting, they will be subjected to further hardship now in competition for food and space in the refugia areas.

Species that will bear the worst brunt of such displacement are specialist species associated with a specific type of habitat. Out of the 199 species, a total of 63 species (comprising 39 forest, 9 grassland, 15 forest freshwater habitat, as given in the EIA report) are restricted to a particular habitat-type, and this comes 32% of the total number of species recorded there, which is of great concern, whether the species is common or uncommon or rare. If they are common or uncommon, their numbers will decline locally (in the project area) or nationally or where relevant globally. If they are rare, they can become extinct either locally or nationally or globally.

And what is also glaring in terms of deleterious impact is that there are the following number of threatened species (nationally and globally) recorded within the project area: 6 mammal species, 30 bird species and 12 herpetofauna species. All in all, this comes to a total of 48 species --- 24% of the total species recorded, which is simply amazing given that the habitat is mostly secondary in nature. This should be of utmost concern for any eco-friendly development project in the world.

One category of wildlife that will be severely disturbed and displaced is the forest freshwater specialists --- fishes, terrapins and amphibians --- some of which
are globally or nationally threatened, like Golden-eyed Rough-sided Frog, Malayan Box Terrapin, Malayan Giant Frog, Malesian Frog, as listed in the EIA. They will be affected by possible water pollution, clearing of forest along streams and waterbodies, etc.

What will further deepen or intensify the deleterious impact is that what is left after the development is not an integrated whole but very disturbed or badly fragmented habitats with the concomitant disturbances coming from what is planned to be massive tourism attractions and activities. The exiles are not going to return to what are their original homes. Some will not be able even to get home or be frightened off from going home with the changes and new features introduced. Those that can get home will now have to compete with free-roaming aliens within the project area introduced for human entertainment. Given this scenario, how could any mitigation measures overcome these problems to result in a small residual impact magnitude?

3) Impact on ecological resources from Restriction to wildlife movement.

**EIA Conclusions:** Magnitude Prior to Mitigation --- medium  
Residual Impact Magnitude ------ small

**NSS Response to Issue 3:**

What follows as to Issue 3 --- restriction to wildlife movement --- is pretty obvious: Apart from most bird and bat species, we cannot see how the magnitude prior to mitigation can be medium for the other categories of wildlife. As to the EIA conclusion that the residual impact after mitigation is small, we are very puzzled as to how this can be derived. To say that it is small is simply to make a tremendous amount of guesswork or take a tremendous amount of risk. We would not be prepared to come to these conclusions here. Since there are plenty of globally and nationally threatened species in the project area and its immediate environs (48 species in total as mentioned above and recorded by the EIA), we urged that the precautionary principle be adhered to.

With a) the development for the Bird Park, b) the non-porous security boundary fencing in both the Bird Park and the Rainforest Park North, c) the wildlife corridor constricted to the 45-50 metres wide forest-belt along the boundary of the existing Night Safari for permitted passageway across the big gap between the two separated sections of the CCNR’s north-western boundary, and d) the planned Eco-Link being a narrow bridge just 30-metres wide over the Mandai Lake Road, it is extremely puzzling how the EIA report can come to the conclusion that the residual impact magnitude is small.

How certain is this conclusion? When the whole development is up, the activities generated and the disturbances that ensue say on both flanks of the wildlife corridor at the Bird Park parcel, how certain we are that most ground-moving (e.g. Sunda Pangolin, Lesser Mousedeer, Leopard Cat) and gliding wildlife (e.g. Malayan Colugo, Horsfield Flying Squirrel), whether nationally or globally threatened species or not, will be bold enough to move along the permitted
passage? Here we should also take into account not just ground-moving species but also shy forest undergrowth species such as White-rumped Shama, Mangrove Pitta, Short-tailed Babbler, etc., species that usually do not take long or above-canopy fight).

Here we should not be tempted to take the **BKE Eco-link** for comparison as that Link is relatively new and the monitoring of results there will take a long time to provide a proper perspective on what goes on there. This is not to deny that so far there is a positive result for Pangolin movement, but it must not be forgotten that the BKE Eco-Link is 50-metres wide, while here it is just 30 metres, and also that at the BKE-Link, human-generated disturbances (such as the presence of large throngs of visitors/users) near both ends and immediate environs of the Link are very minimal and at night almost negligible.

4) **Impact on ecological resources from edge effects on habitats.**
EIA Conclusions: Magnitude Prior to Mitigation --- medium
Residual Impact Magnitude ------ small.

**NSS Response/Comments:** Our main concern here is the impact of ‘edge effects’ on the two portions of the CCNR north and south of the Mandai Lake Road. In the northern portion, the edge effects will be caused by the planned development features both during the construction and after at the Rainforest North Park parcel, while to the south it has to do with the Rainforest Park South. We foresee that the ‘edge effects’ impact will be most probably very severe on the forest and forest-freshwater habitats and their wildlife --- and to be greater in the north than in the south of the Mandai Lake Road, as the CCNR portion there comes in small fragmented patches, especially south of Mandai Road, with the relatively largest patch directly contiguous to Rainforest Park North.

Thus, during the construction of Rainforest Park North, the forest wildlife will be driven into the planned Park’s buffer refugia on the western flank of the CCNR there (that is, at the north-west flank of the Upper Seletar Reservoir). This will obviously bring about a very cramped situation there and it will obviously be inevitable for there to be a rolled-on effect onto the contiguous CCNR patch. Could the displaced wildlife at the CCNR patch simply shift further east? This is very unlikely because the forest patches further east, south of Mandai Road are rather smaller, and more or less disconnected by the creeks/inlets of the Upper Seletar Reservoir. There is a larger fragment of CCNR north of Mandai Road, but the expansion of this road and concomitant busy traffic have resulted in a formidable obstacle for dispersal to ground-moving and gliding wildlife to that patch. So there will be a terrible bottleneck which we expect to result in disastrous consequences for the forest wildlife in general, especially so when the construction phase will take a long time --- in term of years rather than months. **It is rather puzzling to see how the impact magnitude prior to mitigation can be graded by the EIA report as just medium here.**
As to residual impact magnitude, that is after the construction phase, the returnees that can survived the adverse impact before mitigation, cannot simply be said to be able to ‘return home’ because the so-called ‘home’ has changed drastically with the imposition of those concept-plan features with the accompanying drastic constriction of living space to about half its former area-size. Even with planting of trees and other vegetation as a sort of remedial/mitigation measure, it stretches the imagination to visualize the residual impact magnitude on forest wildlife as small.

The other usual ‘edge-effects’ to the CCNR contiguous to the Rainforest Park North due to a thinner buffer will be vulnerability to wind-throw (one terrible case has already occurred in this sector in recent times to the CCNR’s fragmented forest to the east, south of Mandai Road), reduction of humidity and cooling effect (especially so with regard to forest amphibians and fishlife), disturbances from human activities in the Park, diseases coming from alien species that are introduced within the Park or have escaped into the Nature Reserve, etc.

D) Major Items of Contention in the Concept Masterplan

Here we would like to emphasize that we are not against any eco-friendly development plan(s) for the project area. We will leave out any of our response to the concept of the Rainforest Park South, which is within the Wildlife Reserve’s territory (Fig 2.5, p.2-10, EIA Main Chapters), although we have misgivings about that plan as well. But on studying the biodiversity survey results presented, we have vehement objections to the following plans:

1) The Bird Park Plan (Fig 2.4, p. 2-8 EIA Main Chapters).

The Bird Park is completely out of harmony with the eco-tourism image and the ecological dimension of the area that comes with its being contiguous with the CCNR; and should be completely located elsewhere instead (our recommended spots are given in Section E below). Touted to be the largest bird park in the world by re-moving the existing Jurong Bird Park here and expanding it, it will entail a severe destruction of the existing forest habitat there as well as severe curtailment/alteration of forest freshwater habitats and grasslands. Given the impressive number of the nationally and globally threatened species in the project area (48 species in all amounting to 24%, about a quarter, of the total recorded by the EIA), to have the Bird Park there will be to jeopardize WRS’ reputation as a conservation-oriented Zoo.

There is a forest freshwater stream running along western boundary of the Bird Park parcel, more or less parallel to Mandai Track 15. And the thinning of the belt of woods alongside this stream will lead to more sunlight penetration into this sensitive freshwater eco-system and survival problems for the aquatic and semi-aquatic wildlife there such as amphibians.

Another important natural feature of the parcel of great concern here is the thick belt of forest running from south to north in the middle portion of the area,
which constitutes a major green corridor or stepping stone for forest wildlife to move or disperse across Mandai Lake Road. In the plan, this belt of forest will be truncated severely at the northern and southern end and to be replaced by artificial ponds, which will completely obliterate its ecological function as a wildlife corridor and also curtailed drastically its role as an extended or foraging habitat for forest wildlife from the CCNR in that sector.

What is left of the forest habitat in the parcel is just the narrow belt (45-50 metres wide) along the fence of the current Night Safari which is supposed to serve as a wildlife corridor across the north-western sector of the CCNR. For an area that is contiguous to a forested nature reserve that is critical for the survival of Singapore’s forest wildlife, this a terrible blow for biodiversity conservation in Singapore.

2) The Rainforest Park North (Fig. 2.3, p. 2-6, EIA Main Chapters).

The nature of the concept of the Rainforest Park North, as detailed in the EIA document, is most alarming. It will contain two large netted enclosures within its boundary, but not stated as what will be within them. We presume these will be completely covered all round with netted top or roof. If so, we take them to be intended for keeping alien species that can take to the air like birds or bats or animals capable of gliding.

Moreover, what is also planned, although not stated explicitly, is that outside these netted enclosures, there will also be other alien animals (perhaps larger ground-moving charismatic species) put in but roaming freely within the Rainforest Park. Otherwise, why is there a need to have a tight security fence at the boundary if not to prevent such free-roaming alien animals outside the netted enclosures, but still within the Park’s territory, from escaping into the Nature Reserve?

But this will entail that only the existing resident wildlife like birds and bats and gliding animals (to some limited extent) can have access to the Park, excluding resident wildlife such as Water Monitor Lizards, Wild Pigs, Sambar Deer, Sunda Pangolin, Lesser Mousedeer, Leopard Cat, etc., from using the Park. The Sambar Deer and the Sunda Pangolin is globally threatened (in the IUCN Red List) while the Lesser Mousedeer and the Leopard Cat are nationally threatened (in the Singapore Red Data Book). We mentioned the Leopard Cat (a shy, elusive mammal species), -- although not recorded in the EIA, its presence in the area cannot be ruled out as there is a record of a road-kill at Mandai Road (personal comm., Charith Pelpola, 11 June 2001).

Here, we would like to emphasize that the concept plan described in the EIA document for the Rainforest Park North should be just restricted to the Rainforest Park South, that is the one within the existing Night Safari. To have another one outside the existing Night Safari is too extravagant as it entails destroying another invaluable patch of forest habitat that is ecologically a buffer for our CCNR, which is becoming, we would like to emphasize again, more and more a locked-up fortress surrounded by a more and more inhospitable landscape as the decades roll by.
The Rainforest Park North should be a park providing any visitors a real adventure in the jungle without being pampered with easily observable captive alien animals that are completely out of place in our local habitat. Here we have no objection to tree-top walkways, paths, hides and so on within the Park as long as they are designed to be sensitive to the well-being of the animals and their habitat niche there. (More on our recommendation here in the Section E below).

3) The Planned Boundary Security Fence (see both Fig 2.3 & 2.4, EIA Main Chapters):

The plan to put a wildlife-targetted security fence round both project parcels, north and south of the Mandai Lake Road, is extremely dis-ecological --- because tight artificial barriers are put in place to not only wildlife movement / dispersal to and fro across Mandai Lake Road, but also from across both parts of the Nature Reserve contiguous to the project parcels. Our position here is that the Rainforest Park North should be a genuine rainforest park with at most a very porous boundary enabling free-roaming resident wildlife to continue to use the project area for their well-being and survival. If the rationale for the security fence is to prevent introduced /alien wildlife from escaping into the Nature Reserve areas, then on ecological ground, such a possibility should be prevented by not having them within the Rainforest Park North at all. Here, we emphasize again that the Rainforest Park should not on ecological ground deprive any local wildlife that are currently using the area as a habitat for nesting/breeding or foraging, because since the forest habitat is the dominant habitat in the whole project area, forest wildlife originating from the contiguous parts of the Nature Reserve will primarily suffer from this drastic constriction of the existing forest habitat.

4) The Planned Wildlife Corridor & Eco-Link (Fig 2.4, p.2-8 EIA Main Chapters):

The tight, narrow funneling of the wildlife corridor towards the Mandai Lake Road at the southern part of the Bird Park parcel is an extremely formidable path to take for ground-moving animals (like Lesser Mousedeer, Sambar Deer) and undergrowth-affiliated birdlife (like White-rumped Shama, Chestnut-winged Babbler, Short-tailed Babbler, Mangrove Pitta) that need to move or disperse across the road. With a just 45-50 metre broad corridor, can the EIA guarantee that such wildlife will be bold enough to use it --- when on both sides there are artificial fences and also when the projects with their accompanying artificial structures and disturbances are up on both sides of the narrow corridor.

What is worst is that the eco-link (bridge) across the road comes to only 30-metres in width, narrowing down further the already tight pathway at the crucial passageway across the road which become very busy and noisy when the project is completed. What makes it even more problematic is the close proximity of the visitor look-out to the northern end of the Eco-link (bridge) at the lay-bye off Mandai Lake Road. The presence of noisy throngs of humans here will add to the repellent/put-off factor for many wildlife that will attempt either way to make a crossing. The plan for an eco-link (bridge) is a great idea but the crossing at this point
is far from ideal. Moreover, the northern end of the link unfortunately lands at a freshwater forest habitat within the CCNR’s boundary, which will be affected by disturbances and pollution at the construction phase.

It is important to note that without the funneling corridor at the boundary of the existing Night Safari Park, the wildlife in the project areas north and south of the Mandai Lake Road are able to move or disperse across the road on a rather broad front, especially for forest wildlife using three existing belts of forest (Fig 6.4, p. 6-10 EIA Main Chapters) --- the belt at Mandai Track 15, the belt in the central portion of the Bird Park parcel and the thin-belt along the Night Safari Fence. But if the whole project plans are implemented, the belt at the Mandai Track 15 and the belt within the Bird Park parcel, that is, the much broader forest belts available, will be overwhelmed completely by the Bird Park and the public-gateway at “the West Arrival Node” (Figure 2.6 : p. 2-12 EIA Main Chapters), as well as by the boundary security fences on both sides of the Mandai Lake Road, leaving just the very thin belt along the Night Safari Fence.

True, there may be a road-kill once in a while (Pangolin as an example mentioned in the EIA report) --- but will the extreme constriction to movement and dispersal to the one and narrow path with all the artificial structures being there and the accompanying disturbances emerging with them, will that be any the better? Ecologically speaking, we should be also sticking to the well-established precautionary principle here.

E) Concluding Remarks: NSS Alternative Proposals/Recommendations

On the basis of the critique of the MSPH’s concept Plan and EIA report, we would urge MSPH to consider seriously the following alternative proposals and recommendations:

1) Incorporate about half of the project area into the CCNR’s boundary.

Refer to the Google Map attached. This will incorporate a part of the Bird Park parcel and also a part of the Rainforest Park North parcel. For the planned Bird Park parcel, it covers the grassland on the former Orchid Garden patch and the two belts of forest, one at the Night Safari Park flank and the other at the central portion of the Bird Park parcel. For the Rainforest Park North parcel, it covers about half of that parcel on the CCNR’s flank. The resultant effect will be that in this sector of CCNR the deleterious gap will be officially plugged and the unofficial connectivity across the boundary gap will be protected and safe-guarded against any future eventualities. An Eco-link across Mandai Lake Road can be built at the point where the central belt of forest touches the road and where the forest wildlife corridor is wider.
2) Transfer the Enlarged Jurong Bird Park elsewhere

Here are just a couple of recommendations for URA to consider --- at part of the degazetted Jurong Golf-course or at part of the large field at the former Tang Dynasty Museum. As we see it, these two locations will harmonise beautifully with the development of the Eastern Gateway Master Plan at the Jurong Lake area. With the confirmed plan for a High-Speed Rail-Station there, tourism, with the enlarged Bird Park as an added attraction, will benefit tremendously with the Malaysians pouring down to a destination that is so convenient. We do not rule out other possible sites in making these recommendations.

3) Use the Rest of the Project Area for a Wildlife Adventure Camp.

This camp will include the (more open) part of the Bird Park parcel and the rest of the Rainforest Park North parcel, both of which to be integrated into one whole camp. This camp could be run like the OBS-type school --- but to be more focused on ecological education and nature appreciation in a natural forest setting without any introduction of alien wildlife to make things exciting. This will be a more meaningful and challenging programme than to pamper participants or visitors with captive /restricted animals or birds. Many successful wildlife guides we know of and who have also become experts in their fields, have expressed that they find such local wildlife experiences exhilarating and even life-transforming. Some have become professionals in guiding and promoting successfully local nature appreciation among foreign tourists even though so-called big charismatic wildlife are absent locally. With the government push for more outdoor adventure for the younger generations (as can be seen in the establishment of another OBS camp at Coney Island), we believe that the jungle setting at the Mandai Lake Road area can be used to expand and enhance this goal but with an ecological dimension well-embedded into the programme.

4) Restoration Programme for the Raffles’ Banded Langur (Banded Leaf Money).

There is a record of the Raffles’ Banded Langur at the CCNR parcel north of Mandai Lake Road. According to the EIA report, this record is most likely of a singleton. Whatever is the case, this shows that the Langer is most probably exploring for a new feeding or home ground, and here indeed is a great opportunity for Wildlife Reserves to use the area which we have proposed to be incorporated into the CCNR as a base for a programme to making the forest hereabout more attractive and vibrant to this globally and nationally threatened species --- so that the species could have a permanent and viable home ground, and thereby help to generate its very small population in Singapore (now just between 40-60 individuals) to a safer level. This will be another great achievement for WRS’ nationally and globally.

Acknowledgement:

The Conservation Committee would like to thank the following for their contributions to the formulation of the position paper: Andie Ang, Ho Hua Chew, Leong Kwok Peng, Margie Hall, Peter Connell, Yong Ding Li
Notes on the EIA Biodiversity Results: Summary

The Biodiversity Recorded by the EIA (ref EIA Mandai - Main Chapters, Ch 6.6.5)

Given the list in the Safari Park documents, this most impressive and we will just highlight in summary the animal fauna given.

**Mammals (including Bats) ---** total 23 species with 6 nationally & globally threatened.
- **5 locally/nationally threatened** (e.g. Lesser Mousedeer, Lesser Bamboo Rat, Horsfield’s Flying Squirrel)
- **3 globally threatened and near-threatened** (Sunda Pangolin, Raffles’ Banded Langur, Sambar Deer)

**Birds ---** total 123 species with 30 nationally & globally threatened.
- **22 locally/nationally threatened** (e.g. Blue-eared Kingfisher, White-rumped Shama, Red-eyed Bulbul, Black-headed Bulbul, Buffy Fish Owl, Crested Serpent Eagle)
- **11 globally threatened and near-threatened** (e.g. Straw-headed Bulbul, Brown-chested Jungle Flycatcher – migratory, Blue-rumped Parrot, Chestnut-bellied Malkoha, Grey-headed Fish Eagle)

**Herpetofauna (amphibians & reptiles) ---** total 53 species with 12 nationally & globally threatened.
- **8 nationally threatened** (e.g. Tokay gecko, Malayan racer, King Cobra, Twin-barred Tree Snake, Golden-eared Rough-sided Frog, Spotted Tree Frog)
- **6 globally threatened and near-threatened** (e.g. King Cobra, Malayan Box Terrapin, Giant Leaf Terrapin, Malesian Frog, Malayan Giant Frog)

What is significant is the **species-habitat association** as given in the EIA records of the Safari Park Documents (Table 6.24):

Here it is in summary, focusing only on the **natural habitats** involved, we have:

**Primary/Secondary Forest --- 28 species**
- Mammals --- 7 species
- Birds -------- 15 species
- Herpetofauna --- 6 species (out of 13 on list)

**Forested Freshwater Habitat --- 9 species**
- Mammals -------- nil
Birds   -------   7
Herpetofauna   ---   2 species (out 8 on list)

**Grassland Habitat --- 3 species**
Mammals   -------   2 species (Sambar Deer & Sunda Pangolin)
Birds   -------   nil (out of 4 on list)
Herpetofauna   ---   1 (King Cobra -- out of 3 on list)

Appendix

**Map 1: Map of Development**

Document dated: 02 Sept 2016