Nature Society (Singapore)'s Position Paper on Wild Pigs in Singapore

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Introduction

NSS recognizes that whilst the culling of wild animals and birds can be a controversial issue, it remains an established and sometimes necessary strategy in wildlife management for biodiversity and habitat conservation. It is essential however that those undertaking any culling should provide a sound, balanced and reasonable basis for doing so, and recognize that the decision to cull is one that should only be taken after serious and proper consideration. In this respect, culling should only be considered as an option where it represents the only reasonable and practically feasible solution available to wildlife managers and where the impact of culling on the broader ecosystem and the global status of the species has been considered.

Where a decision to cull wildlife has been taken, efforts to do so should be humane, proportionate and undertaken in conjunction with other wildlife management strategies that will minimize the need to undertake similar culls in the future. The decision to cull should also be continually reviewed and updated on a general level and on a specific level to take account of new information or research into population management in general, the effectiveness of prescribed culling efforts in meeting the stated goals of wildlife managers in general and the specific experiences of and results of each actual cull.

The culling of wildlife should always be considered and evaluated on a case by case basis as arguments advanced in support of culling of a species in a particular location may not be applicable or valid in relation to the culling of other species or where the prevailing environmental conditions are sufficiently distinct. In this respect, the views expressed below by NSS and the arguments advanced in relation to wild pigs are its own and independently derived, and are not intended to apply more broadly to other culling initiatives that have previously been undertaken or that may be undertaken in the future by wildlife managers or others in Singapore.

NSS has based its decision solely on consideration of biodiversity and habitat conservation, but recognizes that others have advanced arguments based on public safety.

NSS also respects the views of some members who feel that culling is not justifiable under any circumstances or has not been sufficiently justified in relation to the wild pigs' situation at Lower Peirce.

NSS will continue to review the specific situation discussed below and to consider its position and suggestions on wildlife management at Lower Peirce or elsewhere as new information becomes available, and will revise its position paper or post up a new position paper as and whenever needed.

Nature Society (Singapore)'s Position

Wild pig (*Sus Scrofa*) populations in Singapore have increased over the past several years and may be found in forested areas from the North West through to the North East of the main island. In addition, Pulau Ubin and Pulau Tekong have substantial populations of wild pigs. With no natural predators remaining on the island, the only limiting factor for wild pigs is the lack of viable habitat including food supply and wherever these habitat conditions are favourable their numbers reach problematic levels.

Wild pigs are opportunistic omnivores, feeding on anything encountered: fruits and plant material, small mammals, reptiles, invertebrates and even carrion. Wild pigs can change their diet depending on availability of food types.

Wild pigs are often found in groups of sows with their piglets, juvenile pigs or as individual adult boars. The group size can range from one solitary pig to herds of over 100 pigs or more when conditions are favourable.

Sows are able to start breeding from between 1-2 years of age, have a 21-day oestrous cycle and a gestation period of 112-114 days. Breeding is determined by the quality and quantity of food available. The litter size of wild pigs generally averages between 4 and 8 piglets but may be as high as 10 under good breeding conditions. Under such conditions, wild pigs have the potential to produce two litters within 12 - 15 months and are capable of increasing their numbers exponentially to the point where damage to natural habitat and public safety become serious concerns.

Such a situation is developing in a number of locations around Singapore. Of particular concern are a number of hotspots that have developed within the Central Catchment Nature Reserve (CCNR). Ideal habitat for wild pigs features availability of water and marshy areas as well as the availability of good food sources.

Food sources for wild pigs in the nature reserves include:

- exotic rhizomatous plants (e.g. Yam, Tapioca) about forest edge and former agricultural areas;
- large areas of open grassland where small burrowing vertebrates and invertebrates are dug up and consumed;
- native rhizomatous plants such as Gingers typically growing in moist conditions throughout the reserve;
- seeds, seedlings and roots of native plants and trees. *Syzygium grande* (Sea Apple) is one example of a prolific food source exploited by wild pigs due to the frequency and amount of fruits produced;
- infestations of exotic Oil Palm plants of which seedlings, roots and fruits are aggressively sought out by the wild pigs;

- amphibians and terrapins encountered in marshy areas, e.g. Malayan Box Terrapin; and
- eggs of ground dwelling birds and reptiles.

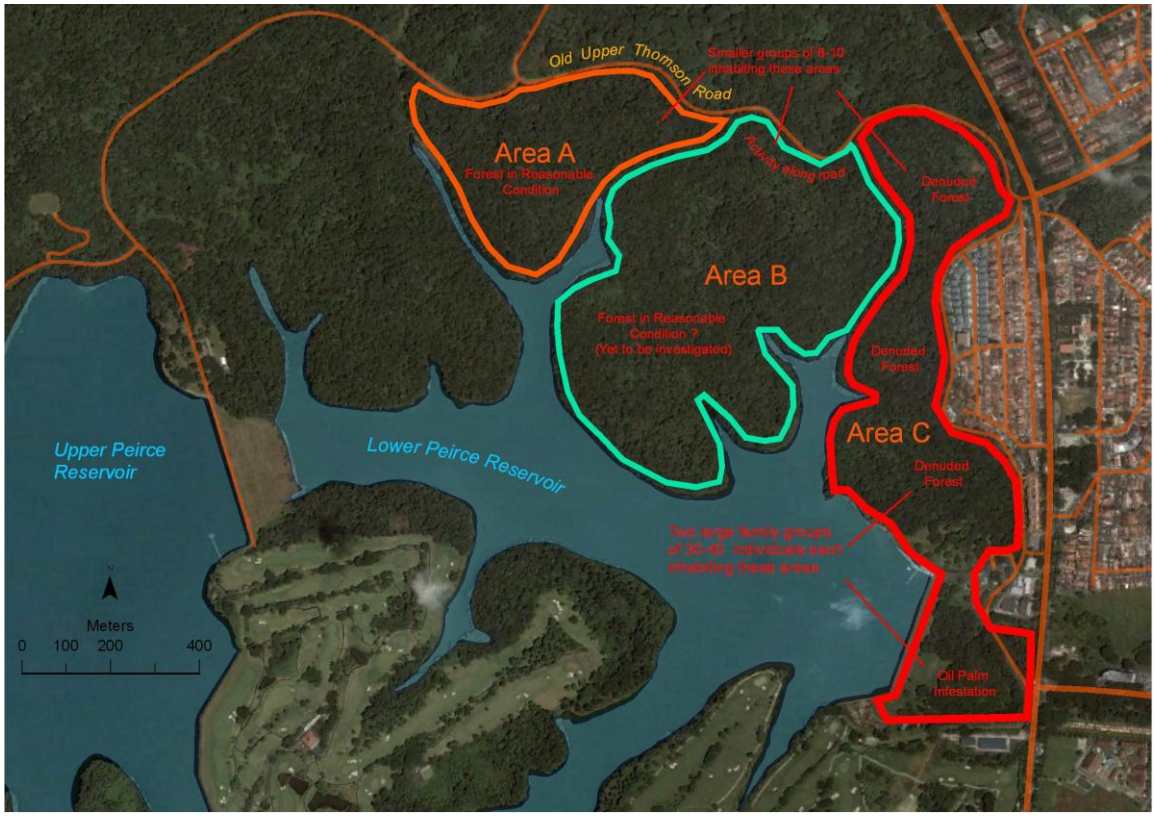
There are currently three hot spots that are of concern, and are being monitored by National Parks Board (NParks). These include Chestnut, Nee Soon and Lower Peirce forests.

Of particular concern is the Lower Peirce forest area where two very large family groups have become persistent and their activities have denuded a significant amount of the Lower Peirce forest and damaged large areas of open grassland within the Lower Peirce reservoir park. Animals from this group have already started to venture across Upper Thomson Road into Bishan Park where a recent attack involving a young boy and an adult was well documented by the news media. A road accident involving a wild pig has also been reported to have occurred along Old Upper Thomson Road.

For the remainder of the CCNR, wild pigs are present; however it would seem that the native secondary and primary forests do not provide sufficient food for their numbers to reach damaging or dangerous levels. It is thought that the pigs need to range further to obtain sufficient food for their needs and thus these areas represent less ideal breeding conditions. As such it has been observed that very little wild pig damage is evident in the central parts of the CCNR. These central populations are currently of little concern though they do need to be monitored in the future.

Wild Pigs at Lower Peirce Forest

The wild pig situation at Lower Peirce has been monitored by NParks for some time. In addition NSS members have made a number of visits to the area in preparation for a detailed damage assessment survey of the Lower Peirce forest which will be discussed later. The map below illustrates the situation of the wild pig populations in the area.



Lower Peirce forest – Central Catchment Nature Reserve

The zone marked as **Area C** on the map is of the most concern. This 0.3 square kilometre area features two well established large families of 30-40 pigs. One group nests on a resam-covered hill within the main secondary forest area (close to the boardwalk) while the other group nests in the palm oil forest to the south. Both groups include gravid females and recently (July 2012) a new batch of 10 piglets was observed. Two dominant males attend to the needs of the females of these groups while individual non-dominant males are generally at large in the forest.

The activities of these groups have resulted in severe damage to the secondary forest in **Area C** evidenced by large areas of rooted-up soil, lack of seedlings (due to seeds being eaten), damaged saplings (broken and used for nests) and general trampling. The concerns for the areas affected as described are that:

- regeneration of forest is inhibited by the activity of the pigs;
- competition with other native animals will occur; and
- erosion will cause loss of already limited top soil.

The following images illustrate the classic characteristics of areas with unnaturally high concentrations of wild pigs.

Bare turned over soil – no regeneration

Exposed slope due to rooting – erosion risk

Secondary forest affected by pig rooting

Unaffected Secondary forest

Denuded stream and banks

Grassland dug over for worms and insects

By contrast the zone marked **Area A** on the map is substantially less adversely affected and shows healthy regeneration of forest trees even though there is some evidence of wild pig activity in the area. The zone marked **Area B** has not yet been investigated in detail, however it is thought to be similar to **Area A**.

How Many is Too Many?

If we take the conservative side of the current Lower Peirce population estimate, i.e. 80 individuals persistent within Area C (0.3 sq km) we compute a density of 266 pigs/sq km. A

study of wild pig population at Pasoh forest (Malaysia) where populations were considered higher than normal and detrimental to primary forest regeneration determined a population density of 34.5 pigs /sq km. The high population at Pasoh was thought to be brought about by availability of good food sources due to nearby oil palm. The Pasoh situation is similar to the Lower Peirce situation in that excessive oil palm is available within the area. A comparison of pig densities between the two sites shows that Lower Peirce density exceeds that of Pasoh by a factor of 7.7!

It may be argued that the population estimates and densities computed may be subject to errors of interpretation and limitations of methodology, and that habitat differences (primary versus secondary forest) means that these densities cannot be directly compared. Nevertheless the current population and density exceeds these Pasoh estimates by such a large margin that there is great cause for concern.

Ultimately the true test of whether the area is over populated or not will be determined by the effect on the habitat rather than the numeric value of population. At Lower Peirce the extensive rooted up areas, absence of seedlings, snapped saplings (for making of nests) and general trampling of the forest are clear signs that the land is severely overpopulated by wild pigs. The population density of wild pigs at Lower Peirce is currently at a level where forest regeneration is severely retarded.

What Should Be Done?

Short Term Needs

The wild pig population at Lower Peirce needs to be substantially reduced immediately for the following reasons:

- to arrest the denuding of the forest by wild pigs and allow forest regeneration to return to previous rate;
- to maintain sufficient resources for other wildlife that inhabit the forest (e.g. Mouse Deer);
- to arrest the predation of native species by wild pigs (Malayan Box Terrapin, insects and worms etc that are predated upon by the pigs); and
- to reduce the risk to public safety represented by the high population of wild pigs.

Similar over-population treatments in Singapore and other countries involve culling. The only alternative to culling is translocation; however translocation is not considered a viable alternative as it would merely transfer the problem to another area.

Long Term Needs

Immediately upon completion of the cull in the Lower Peirce area it is important that actions be taken to limit a repeat occurrence of overpopulation by wild pigs that will enter the area from other parts of the CCNR.

The availability of oil palm and other potentially rich food sources are thought to be the reason for the original overpopulation situation. This needs to be established factually by

field survey as a matter of urgency. If the hypothesis is that oil palm is the influencing factor, it will be necessary to deny access or remove this exotic species from the forests. The proposed approach is:

- to fence off the oil palm forest at the southeast section of the Lower Peirce site to deny access to this food source and marshy habitat to wild pigs that recolonize after the initial cull is completed;
- to immediately begin a program of removal of oil palm from the secondary forests and at the same time undertake enrichment planting with native species;
- to consider thinning out *Syzygium grande* where it is growing profusely in the board walk area;
- to ultimately remove the oil palm forest (previously fenced) and rehabilitate with native species; and
- to commission a study of wild pig populations in CCNR to determine optimum population density for CCNR secondary forests. This information will be needed later to monitor the re-establishment of pigs at Lower Peirce after the initial cull. It will be necessary to determine how large the population should be allowed to grow before further culling programs are considered.

How can NSS help

NSS is already involved in a survey to map the combined occurrence of pig activity with that of oil palm and other potentially rich food sources. This survey is currently in progress and will be completed within a few months. The outcome of the survey is expected to confirm the hypothesis that high densities of wild pigs are highly correlated with the presence of exotic oil palm infestations in the area and therefore will support the long term treatment suggested by NSS. It will also determine whether NSS can suggest any other actions that will prevent wild pig overpopulation of this area.

Question and Answer

Q: Why does NSS support the culling of pigs at Lower Peirce forest?
A: NSS recognizes that the CCNR is a very small fragmented habitat and as such needs to be managed carefully and thoughtfully. Part of this management may involve culling species that have become detrimental to the diversity of flora and fauna or a danger to life and limb. The wild pig population at Lower Peirce is recognized to be severely excessive and therefore we support the need to implement a cull to bring numbers back to reasonable levels. At the same time we expect that steps will be taken to avoid or minimize the need to perform culls in the future.

Q: Why can't we translocate the pigs as an alternative to culling?
A: Translocation is not considered practical as there is no location in Singapore to which they could be moved to without its resulting in moving the problem from one place to another.

Q: What is NSS' position on the method of culling?
A: NSS is a conservation organization, and as such is not qualified to recommend or critique the methodology for the culling of wild pigs. We trust that the authorities undertaking the cull will utilize methods that minimize suffering of the pigs.

Q: Instead of a cull, could we administer contraceptives or sterilize the wild pig population?
A: There are a number of problems with this idea:

1. the availability and delivery mechanism is not considered to be sufficiently available nor reliable;
2. this treatment will not solve the current problems of overpopulation or public safety;
3. the treatment would need to be given to wild pigs substantially beyond the limits of Lower Peirce and would therefore be impractical; and
4. even if the treatment could be made practical, the method would need to be practised in perpetuity and therefore does not represent an acceptable long term solution.

Q: Could we use barriers to constrain the pigs to within the forest?
A: To constrain the Lower Peirce wild pigs we would need to fully fence off the Lower Peirce Reservoir Park, water pumping station, the boardwalk area and the reservoir itself - such that access will be denied to urban areas. This would not solve the problem of forest regeneration and nor is it practical. Barriers may however be considered post-cull for denying access to sought after sub-sections of habitat by roaming wild pigs that are expected to enter the area.

Q: Couldn't we just remove the oil palm and avoid the need to cull?
A: No, the disturbance and denial of food to such a large population of wild pigs would likely result in their dispersal into urban areas, substantially increasing risks to humans.

Q: Are wild pigs seed dispersers?
A: Wild pigs are not effective seed dispersers for our native forest species because the seeds are generally destroyed in the gut; only small seeds pass through the gut unscathed.

Q: Are wild pigs dangerous?
A: Wild pigs are potentially dangerous due to their unpredictable behaviour. While wild pigs generally flee when approached by humans, there are circumstances in which they will attack. Usually when an attack occurs the humans are neither aware of the pig's presence nor conscious of any act of anatomization. There have been accidents in Malaysia and Singapore in recent times with the Malaysian cases involving deaths as well as serious injuries. To date there have been no serious injuries in Singapore. The best practice is to give wild pigs a wide berth and to be cautious in areas where they are known to roam.