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Biodiversity of the Kampar Peninsula

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INTRODUCTION

The Kampar Peninsula is a 673,000 ha landscape that includes 344,000 ha of peatswamp forest, approximately 181,000 ha of fibre plantations, and a mixture of other multiple land use areas. This kaleidoscope of multiple land use areas comprises of industrial-sized oil palm, rubber plantations as well as small-holder plantations, farmlands and human settlements. The Kampar Peninsula is possibly the largest contiguous area of peatswamp forest remaining on Sumatra. Distributed across much of South East Asia, tropical peatland forests possess a characteristic assemblage of flora and fauna borne out of humid and acidic waterlogged conditions. The Kampar Peninsula is also of global significance being designated as a Class II Tiger Conservation Landscape, Important Bird Area (IBA) as well as a Key Biodiversity Area (KBA) as the site contains significant number of globally threatened species as well as biome-restricted species.

Furthermore a total of around 130,000 ha of this are licensed under four concessions and managed under the Riau Ecosystem Restoration (RER) Programme (Fig. 1). The RER Programme brings together private and civil society groups, as well as government regulatory agencies, in a landscape level approach to protect, assess, restore and manage previously degraded peatland. Detailed inventories have been conducted since 2010 of these wetlands, recording a total of 299 bird, 152 plant, 74 mammal, 107 amphibian and reptile and 89 fish species. Around 49 species are listed in the IUCN Redlist as threatened (Critically Endangered [CR], Endangered [EN], Vulnerable [VU]). These inventories represent the first documentation of the biodiversity of the Kampar Peninsula, and are especially important in light of the current conservation status of peatlands on Sumatra.

Figure 1. Map of the Kampar Peninsula

METHODS

The biodiversity baseline results are largely a collation of two major biodiversity surveys completed by Tropenbos in 2010 and Fauna Flora International (FFI) in 2015. However the result also takes into account anecdotal and personal observation from 2004, 2007, up to June 2017 collected while out in the field.

The 2010 Tropenbos survey consisted of 29 biodiversity survey sites distributed mostly across the periphery of the Kampar Peninsula but also on the peat dome core areas. The surveys lasted for a few months and were carried out in the morning and afternoon by teams depending on the targeted taxa. The survey focused on collecting information on mammals, birds, plants, reptiles and amphibians. The survey also incorporated local knowledge and information on species sightings through interviews with locals.

The 2015 FFI survey was conducted primarily on RER concessions, dividing three concessions (PT. GCN, PT SMN, PT. TBOT) into grids and sampling along defined transects. Survey times were also divided into daytime and nighttime surveys with the addition of single and paired camera trap stations set up to be active for 24h. Additionally fish diversity of the Kampar Peninsula was sampled along the Serkap, Sanggar and Turip rivers. The entire list of survey methods employed for each taxon summarized in a table (Fig. 2)

Figure 2. Table of survey methods used for each Taxon

Activities	Bird	Mammal	Amphibian / Reptile	Plant	Fish
Interview	✓	✓	✓		✓
Camera Trap	✓	✓	✓		
Point Count	✓				
Visual Encounter Survey (VES)	✓	✓	✓		
Sound Call Back	✓				
Trapping		✓			
Sample Collection			✓	✓	✓
Plots				✓	
Point Sample					✓

RESULTS

Records indicate high avian diversity in the Kampar Peninsula, with 299 species from 66 families, 241 are resident, 49 migratory and 9 have both migratory and resident populations. Fourteen bird species are considered globally threatened as classified by the IUCN Redlist with 1 CR, 3 EN and 10 VU species. The Kampar Peninsula hosted 8 out of the 9 possible hornbills found in Sumatra including the Helmeted Hornbill (*Rhinoplax vigil*) which was the only critically endangered species. The survey also revealed new distributional records for the Black Partridge (*Melanoperdix niger*) and Bonaparte's Nightjar (*Caprimulgus concretus*). Peatland associated species found include the Hook-billed Bulbul (*Setornis criniger*), Storm's Stork (*Ciconia stormi*) and White-winged Duck (*Asarcornis scutulata*)

which has an estimated population of less than 150 individuals in Sumatra.

Eight of the 152 vascular plant species recorded are globally threatened, with the critically endangered peatswamp endemics *Shorea platycarpa* and *Vatica teysmanniana* recorded. The dominant plant families were Myrtaceae and Dipterocarpaceae, with the high abundance of *Shorea teysmanniana* and *Shorea uliginosa*. Dipterocarpaceae are the most abundant tree family with six species that are all listed as threatened. Of the 152 species recorded, 112 were woody plants (trees) that possessed widespread buttressed roots which were well adapted to areas with high water fluctuation and waterlogged conditions. The remaining 40 plant species were comprised of various orchid species as well as two species of pitcher plants; *Nepenthes ampullaria* and *Nepenthes rafflesiana*.

Seventeen of the 74 mammal species recorded are globally threatened, with 2 CR, 3 EN and 12 VU. Six primate species were recorded including the Agile Gibbon (*Hylobates agilis*) and the nocturnal Sunda Slow Loris (*Nycticebus coucang*). The critically endangered species include the heavily threatened Sunda Pangolin (*Manis javanica*) and the Sumatran Tiger (*Panthera tigris sumatrae*). Six cat species are found through out the entire island of Sumatra, five of them can be found in the Kampar Peninsula, only the Asiatic Golden Cat (*Catopuma temminckii*) is absent. Camera trap photos from five separate camera traps during the FFI survey revealed the presence of the elusive Flat-headed Cat (*Prionailurus planiceps*), a species strongly associated with wetland habitat.

From the 22 amphibian and 85 reptile species, 10 are globally threatened, with 1 CR, 4EN and 5 VU. The numbers of amphibians are low due to the acidic conditions however survey revealed new distributional records for the recently described cryptic frog species *Hylana rawa* and *Hylarana parvacola*, both of which are endemic to Sumatra. Two crocodile species the Estuarine Crocodile (*Crocodylus porosus*) and the vulnerable False Gharial (*Tomistoma schlegelii*) was confirmed present. Ten species of turtles were documented, this includes the critically endangered Painted Terrapin (*Batagur borneoensis*).

Preliminary fish surveys documented 89 species that are dependent upon narrow and extreme abiotic conditions. Low pH, low dissolved oxygen levels, as well as high tannin levels are conditions that require specific adaptations from the fish species. Cyprinids are the most represented family with 35 species (39%) out of the 89 total. Fish species are important for the community as around 39 species are found in the aquarium trade as well as 15 species sold for food. A new species *Pectenocypris nigra* and the world's smallest fish *Paedocypris progenetica* were notable discoveries from the survey.

DISCUSSION

With the wide ranging variety of species found in the Kampar Peninsula come inevitable conservation issues when dealing with threats to their populations. Birds are a popular commodity, as keeping them as pets or for songbird competitions connected to Javanese culture and is considered common practice. Blue-crowned Hanging Parrot (*Loriculus galgalus*), shama, sunbirds and leafbirds represent popularly traded species. Plants and trees face direct threats from illegal logging and fires that are used for clearing land. Mammals face a wide variety of threats, with macaques often captures and sold as pets, chevrotain and deer hunted for food and the Sumatran Tiger and Sunda Pangolin targeted for the illegal wildlife trade. Reptiles face hunting threats with Reticulated Pythons (*Malayopython reticulatus*) and Estuarine Crocodile (*C. porosus*) being hunted for their skin. Turtles represent the most endangered reptile group as they are often caught as bycatch and sold for meat. Seven out of ten turtle species found are considered globally threatened.

RER's management of 19% of the Kampar Peninsula serves an important role in protecting globally threatened species and in supporting Indonesia's commitment to climate change mitigation. In order to more comprehensive understanding of the biodiversity within the Kampar Peninsula more research and collaboration should take place. Furthermore a survey of RER"s fourth and last concession on the Kampar Peninsula; PT. GAN is scheduled for the near future.

Status of White Winged Duck in Kampar Peninsula

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Introduction

The White-winged Duck (Asarcornis scutulata) is a tree-nesting duck. Historically the species was distributed from the Northeastern India states bordering Brahmaputra river and its major tributaries to Greater Sunda Islands of Sumatra and Java in Indonesia. Now the birds survive in scattered area of its former range. It is locally extinct in Java and no recent confirmed records in Malay Peninsula.

The Sumatran population is distinctive in appearance from the Northern mainland population with more white coloration on the head and wings. Some authors suggest the Sumatran population should become a separate subspecies. Its range on Sumatra has been drastically reduced over the last 30 years. Based on 2016 assessment, IUCN classifies White-winged Duck (WWD) as Endangered. It is a protected species in Indonesia.

Prefers low laying water body adjacent to natural forest and have been recorded visiting rice fields. Unlike other duck species which form flock, white-winged ducks are commonly observed in pairs.

White-winged duck in Kampar Peninsula

The Kampar Peninsula is one of the most important areas of peatland on Sumatra, covering some 673,000 ha of peat swamp forest, fiber plantations, oil palm, rubber and sago farms. It is possibly the largest contiguous area of peat swamp forest remaining on Sumatra. 311,000 ha area of these wetlands is managed by the APRIL Group, where 181.000 is fiber plantation and 130,000 ha of natural forest is managed under the Riau Ecosystem Restoration (RER) Program.

Initiated by APRIL in 2013, the RER Program brings together private and civil society groups, as well as government regulatory agencies, in a landscape level approach to protect, assess, restore and manage previously degraded peatland. This ecosystem restoration license is granted for 60 years. The forest is home to critically endangered sumatran tiger, sunda pangolin and some other unique wetland species such as flat headed cat, storm stork, white winged duck and false gharial. The presence of suitable habitat in Kampar Peninsula with better management and protection would contribute to secure future survival those taxa.

In 1990, Asia Wetland Bureau (AWB) organized island-wide surveys in all suitable habitats and visited historical sites of White-winged Duck sightings. Two years later, BirdLife conducted an assessment of Important Bird Area (IBA) on Siak-Kampar peat swamp forest in Sumatra including the Kampar Peninsula.

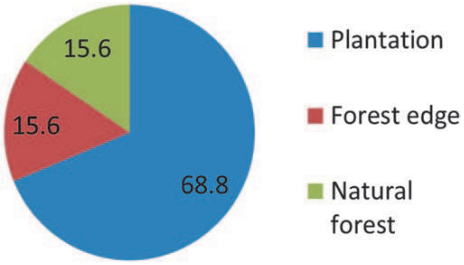
The survey focused on the northern part of the Kampar Landscape. Both surveys failed to find WWD in Kampar peatland. These findings raised questions about the presence of WWD in this landscape since they were recorded on Giam-Siak kecil Landscape on the north and Kerumutan Game Reserve on the south.

WWD was first sighted in Kampar Peninsula peatland landscape on April 2007. Since then duck sightings have been reported every year. In 2013 WWD recorded for the first time inside Riau Ecosystem Restoration. In total there are 30 confirmed sightings in last ten years.

Habitat preference

Encounters occurred mainly on artificial canals, either in plantation or forested areas (e.g. canals constructed for illegal logging prior to ER concession). The rest of sightings were birds flying over plantation, or over natural water ways. Aged canals in the plantation seems to match WWD required habitat, this ducks are more likely to be found on 4 years or older stands where tree canopy creates shade over the canal. Long straight canal gives the duck space needs for take off. They are quite frequently observed on perimeter canals bordering plantation and natural forest. When feel threatened the ducks left the water and fly, quite frequently perch on main branch of large native trees (please refer to fig. 1).

Figure 1. Percentage of sighting location/habitat usage



Before 2013 there was limited time spent traveling on the natural forest and riverine area which meant there was a bias towards finding birds in the plantation canals. When ER stated to operate within the landscape, travel on the rivers increases, as they are the main access routes to reach the ecosystem restoration area. However, this did not increase the number of duck observation on the river and natural forest away from plantation. There is a single observation or 3.3 % from total of bird sighted flew over one of the river.

In natural forest, they may avoid open rivers and prefer small lakes that are scattered on the flood plain (interview with local fishermen). These lakes only connected to the main river during rainy seasons floods. WWD was observed to visit water holes created during the construction of access path through peat swamp forest about a year after the establishment of the access.

Breeding record

Ducklings were observed in April. An adult duck along with five ducklings was photographed on plantation canal in 2015. Other records were from ducklings collected by fishermen in April 2016, presumably after killing and consuming the mother. The first report of breeding in Acacia plantation was from August 2014. The clutch size observed were five ducklings in 2015 and 2016 observations. Number of clutch of 2014 observations cannot be confirmed. These records raise the possibility that white-winged ducks nest in plantation.

Threat

Thread occurs in the form of opportunistic hunting and has been recorded. One of the incident involve molting birds and the other on breeding female (see above). Molting birds shed

part of their feathers and lose their ability to fly, temporarily making them vulnerable. Apart from hunting the adults, collecting ducklings was also documented. Fishermen and workers are educated and requested not to take the birds. A Standard Operation Procedure was created to provide guidance on how to handle birds that are temporarily unable to fly. Other threats include natural predators such as water monitor lizards prey on duckling and birds of prey kill adult birds.

Activity Pattern

The majority of observations occur before 10 o'clock. It is suggested that peak activity of WWD in Kampar is around that time. Since most observation occurred on plantation the activities within plantation may have some impact on WWD activity pattern. Long term observation in Way Kambas in Southern Sumatra suggests double peak on WWD daily activity. Its highest activity is between 7 to 8 o'clock in the morning and 4 to 5 before sunset (Figure 2).

Population Estimation

In the past population estimation of WWD was conducted by direct count of animals sighted during the survey. There is no standardized method applied on this subject. Hence no estimation number of WWDs available for the Kampar Peninsula. However given the current observation records, breeding records, the extend of the landscape, better controlled access, it might assume that the population could be small but stable.

Activity in the future:

Conduct intensive search during suspected breeding period (March to April) to document breeding in the plantation.

Increase awareness to fishermen and workers about status of the bird, especially during breeding season. No hunting sign for white-winged duck and other protected animal will be put on places easy to look at by passer byes.

Trial of better methods to estimate population will be conducted.

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Figure 2. Cumulative sightings of white-winged duck during day light.

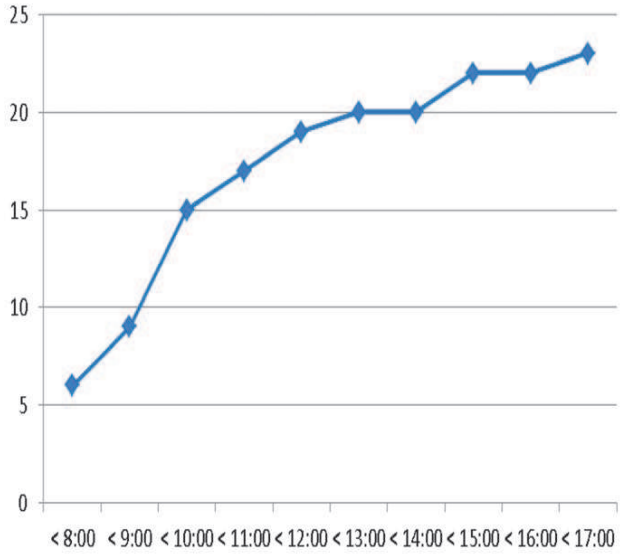

Figure 3. Pair of white-winged ducks on man made canal