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# Orang-utan Bridges in Lower Kinabatangan

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Field surveys between  
Abai and Batu Puteh

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## BACKGROUND INFORMATION

Unlike monkeys, none of the great ape species can swim. In Kinabatangan (eastern Sabah, Malaysian Borneo), our recent genetic and eco-ethological studies have revealed that rivers created barriers that were impassable to the orang-utans and that these natural frontiers were fragmenting wild populations. We also showed that the genetic allelic structure of orang-utan sub-populations living on both sides of the Kinabatangan River was different (Goossens *et al.*, 2005).

However, with the recent removal of large trees that provided natural bridges over small waterbodies through canopy connection, many tributaries that used to be crossed by wildlife become impassable to the orang-utans and to other arboreal species. **This fragmentation process is further worsened by the creation of drains that are set up by oil palm estates through the forest.**



*Drain illegally established by an oil palm estate through the Lower Kinabatangan Wildlife Sanctuary: this drain is cutting off orang-utan sub-populations living on both sides of the drain.*

As a result, the Kinabatangan orang-utan population is fragmented in more than 20 different sub-populations that are completely isolated from one another. **Our recent “Population Habitat Viability Analysis” showed that most of these sub-populations will go extinct in a foreseeable future unless they are reconnected together** (Bruford *et al.*, 2010).

The Kinabatangan Orang-utan Conservation Project (KOCPP) erected a first experimental “orang-utan bridge” in 2003 above the Rasang River. We were aiming at reconnecting the two isolated sub-populations living both sides of this small tributary in Lot 1 of the LKWS. The first bridge was just made up with a single rope tied up around two trees both sides of the river. Over the years, we tested several designs such as double ropes, double chain links, two to three fire hoses intertwined together in order to determine what bridge would be the most likely used by orang-utan to cross water bodies. With the support of various partners (Cleveland Zoo, Columbus Zoo, Houston Zoo, Borneo Conservation Trust Japan – to name a few) we erected a total of 6 bridges above two small tributaries close to the village of Sukau: Rasang and Meningol.

Although local people reported that orang-utans were using these bridges several times, the first documented evidence became only available in February 2010 when Ajiran Osman, a member of the local community with a marked interest on wildlife succeeded to take the following pictures (see below).

This positive result indicates that by establishing bridges over small tributaries and artificially created drains we will be able to reconnect orang-utan sub-populations that are isolated by these water bodies.



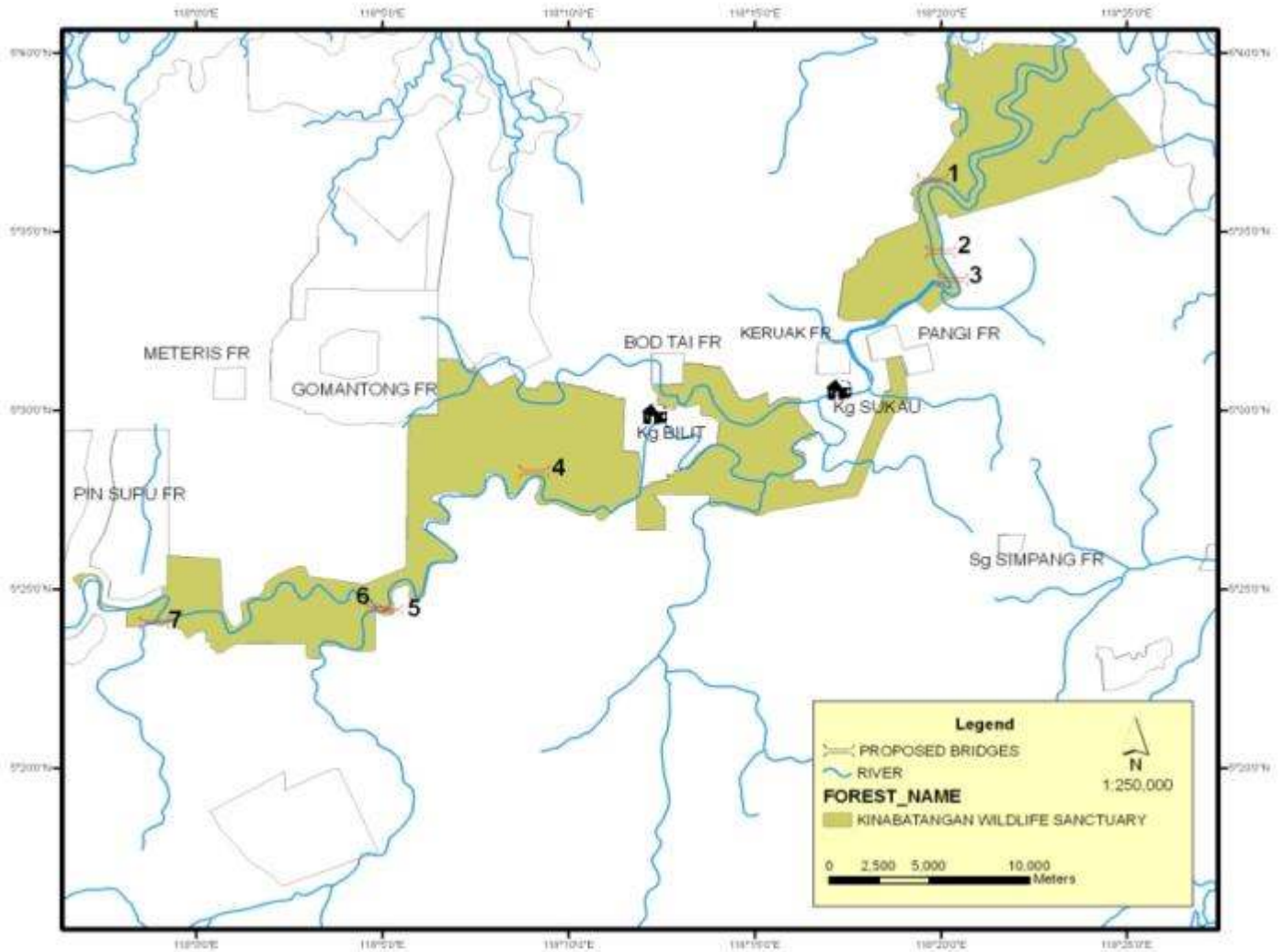
*Unflanged orang-utan crossing the Rasang River by using the single rope bridge established in 2005 above this tributary of the Kinabatangan River.*

The goals of this survey were (1) to identify the bottlenecks that are possible isolating orang-utan sub-populations in the Lower Kinabatangan and (2) to identify sites suitable for bridge construction to alleviate the issues of orang-utan population fragmentation. This report presents the results of surveys that were conducted between the villages of Abai and Batu Puteh early 2010 (lower parts of the LKWS, Lots 1 to 5).



## RESULTS OF THE BRIDGE SURVEYS BETWEEN ABAI AND BATU PUTEH

During our survey, we identified a minimum of seven bottlenecks between Abai and B.Puteh (see Map below).



We collected the precise location and collected information about each bottleneck that was identified during our surveys. We also assessed the feasibility of erecting bridges and we finally ranked all these bottlenecks in order to determine the most urgent actions to be undertaken.

So far, we have identified a minimum of seven bottlenecks:

- three bridges need to be erected between Abai and Sukau
- no bridge is needed between Sukau and Bilit
- four bridges need to be erected between Bilit and Batu Puteh

**BOTTLENECK NUMBER 1: Drain located between Abai and Sukau**

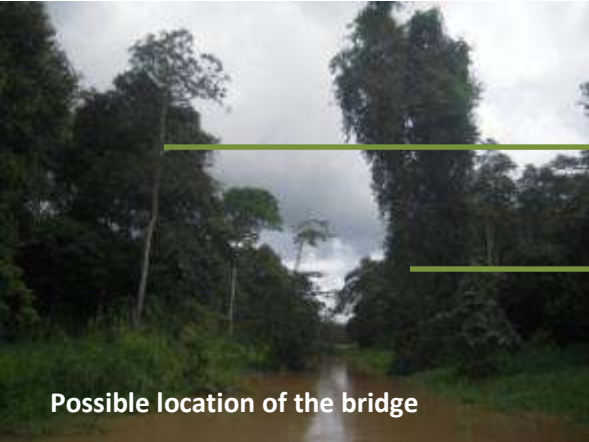
Location of the drain: N 05 36 25.0 – E 118 19 41.8  
Close to Malbumi plantation – Lot 2 of the LKWS  
Length of the drain: About 400 m  
Width: Between 30 and 35 m

**Comments:**

A bridge made up with culverts is available on the far end of this drain. The bridge is used by elephants and may be used by orang-utans walking on the ground.

Two trees located on both sides of the drain are relatively large enough for erecting a bridge (*Dracontomelon dao* and *Planchonia valida*): N 05 36 29.7 – E 118 19 37.9.

**Priority: LOW since orang-utans have the possibility to use the culvert bridge already available.**



**BOTTLENECK NUMBER 2: Drain located between Abai and Sukau**

Location of the drain: N 05 34 29.7 – E 118 19 45.8  
Lot 1 of the LKWS  
Length of the drain: About 250 m  
Width: Between 30 and 35 m

**Comments:**

No elephant bridge has been built on the drain and the orang-utans cannot move between the two forest patches.

We failed to identify trees of suitable size to set up a bridge. Consequently, we will have to erect a belian tower. A simple tower will consist of a single belian post of about 15-20 feet tall footed in the ground on both sides of the drain. Ropes will be connected from the closest trees to the belian post(s) and between the two posts above the drain.

**Priority: HIGH**



**BOTTLENECK NUMBER 3: Drain located between Abai and Sukau**

Location of the drain: N 05 33 42.0 – E 118 20 11.8  
Lot 1 of the LKWS  
Length of the drain: About 260 m  
Width: Around 50 m

**Comments:**

No elephant bridge is available along the drain and the orang-utans cannot go through.

We failed to identify trees of suitable size to set up a bridge. Consequently, we will have to erect a belian tower in order to set up the bridge.

**Priority: HIGH**



*Mouth of the drain reaching the Kinabatangan River*



**BOTTLENECK NUMBER 4: Drain located between Bilit and Batu Puteh**

Location of the drain: N 05 26 34.2 – E 118 06 16.6  
Lot 5 of the LKWS  
Length of the drain: About 100 m  
Width: Around 30 m

**Comments:**

The riparian forest is very narrow but might be used by orang-utans for dispersal. As such, the animals cannot cross this drain and a belian tower needs to be established.

**Priority: HIGH**



*View of the drain from the Kinabatangan River*



**BOTTLENECK NUMBER 5: Drain located between Bilit and Batu Puteh**

Location of the drain: N 05 24 29.2 – E 118 05 06.5  
Between Danau Girang Field Center and Koya River (Lot 5)  
Length of the drain: More than 100 m  
Width: Between 20 and 40 m

**Comments:**

This drain is established in a very narrow corridor of forest left standing in the riparian reserve along the Kinabatangan River. The forest corridor is less than 30 meter wide in most places. This drain is a major impediment disrupting the orang-utan sub- population that is living in Lot 5 of the LKWS.

Given the large width and the absence of trees that may support a bridge, a belian tower will have to be erected to establish the bridge.

**Priority: VERY HIGH**



*Confluence between the drain and the Kinabatangan River*

**BOTTLENECK NUMBER 6: River Koya located between Bilit and Batu Puteh**

Location of the River: N 05 24 31.8 – E 118 04 44.2  
River Koya – lower Danau Girang Field Center (Lot 6)  
Length of the river: Several hundred meters  
Width: Around 40 m in the lower parts

**Comments:**

It was impossible to reach the upper parts of this River because of the low water levels. However we identified several large trees along the River that could be used by the orang-utans as natural bridges to cross this tributary.

**Priority: LOW, because of the existence of natural bridges in the upper parts of this tributary**



*Lower parts of the Koya River:*

*-no natural bridge  
-the distance between the two banks requires the erection of a belian tower to establish a bridge*



*Medium parts of the Koya River:*

*-several trees could be used for erecting bridges*



*Upper parts of the Koya River:*

*-presence of natural bridges*

**BOTTLENECK NUMBER 7:****River Takala, located between Bilit and Batu Puteh**

Location of the River: N 05 24 29.2 – E 118 05 06.5  
River Takala – upper Danau Girang Field Center (Lot 6)  
Length of the river: Several hundred meters  
Width: Around 30-35 m

**Comments:**

Due to the low water level, it was impossible to explore this tributary entirely. No natural bridge was identified during the survey and we recognized that orang-utans cannot cross this River. Further survey needs to be done to decide whether a bridge can be established between trees both sides of the river or if there is a need to erect belian towers.

**Priority:****VERY HIGH**

*View of the Takala River showing the absence of natural bridge*



## LITERATURE CITED

- Goossens, B., Chikhi, L., Jalil, F., Ancrenaz, M., Lackman-Ancrenaz, I., Mohammed, M., Andau, P., and M.W. Bruford. 2005. Patterns of genetic diversity and migration in increasingly fragmented and declining orang-utan (*Pongo pygmaeus*) populations from Sabah, Malaysia. *Molecular Ecology*, 14: 441-456.
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