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Clear and present danger: Clearing of riverine vegetation at Kuala Selangor for banana and oil palm plantation has destroyed the habitat of the synchronous flashing firefly *Pteroptyx tener* that is the source of a thriving eco-tourism activity in the otherwise sleepy hollow. In the background is a thin line of berembang trees left standing. - ONG SOON HIN/The Star

HILARY CHIEW

SEVERAL nibong stems straddle the creek that drains the intertidal zone at Kampung Beluntas into Sungai Selangor. Valued as a sturdy material for make-shift bridges in rural areas, nibong trees are among the floodplain vegetation cleared recently to make way for oil palm cultivation.

The land clearing detected in Kuala Selangor is situated opposite the jetty where tourists board a fleet of 31 wooden boats to view the spectacular light show – the famous synchronised flashing of fireflies on berembang trees along the riverbank at Kampung Kuantan.

It is learnt that 52ha of the riverine area belonging to an unknown number of private landowners are being developed for the cash crop by a local from nearby Kampung Belimbing. So far, 32ha have been stripped of riparian vegetation consisting of nibong, rumbia, nipah and fig trees, leaving only a narrow strip of berembang trees lining the bank. In some parts, the clearing is right up to the river edges.

"The clearing work started last May and is scheduled to be completed by June. Work is slow because the soil is very soggy especially after a rainy spell and this can sink the excavator," says a source at the site.

"Some parts of this land has been left idle for the last 80 years and this is a good source of income for landowners. It costs the developer RM1,500 to clear one acre (0.4ha). This is not an illegal activity," he says. He claims that the developer has obtained the agreement of 24 landowners for a 15-year lease.

It is unclear if the berembang trees were spared in keeping with the guideline of 50m river buffer or as a convenient screen for the destruction.

Drastic changes

News of the destruction at Kampung Beluntas follow a spate of clearing along the riverbank highlighted by various media in March. In fact, periodic clearing has been occurring since 2007, according to researchers at the Forest Research Institute of Malaysia (FRIM).

Funded by the Department of Irrigation and Drainage, a team from FRIM was given RM200,000 to monitor the habitat for a two-year period from 2006 under the Integrated River Basin Management project to develop a systematic monitoring method for the firefly population.

The firefly colony of Kuala Selangor faces constant threats – from the construction of the Sungai Selangor Dam to waste pollution and now, destruction of its breeding habitat.

Although fireflies aggregate along a 10km stretch downstream of the 110km Sungai Selangor, nine sites along a 1.6m stretch of riverbank was surveyed on a monthly basis. Tree lines on the opposite banks were photographed for comparison over the months.

"As we observed more and more clearing at the monitoring sites between Kampung Kuantan and Bukit Belimbing last November, we wrote to the Kuala Selangor District Council," says the team leader Dr Laurence Kirton.

However, the entomologist from FRIM acknowledges that human modification of the riverine habitat along Sungai Selangor is not a recent development. In 2005, he analysed satellite images of a 5sqkm area around Kampung Kuantan and found that almost 70% of the land has been modified or developed.

Drastic changes to vegetation along the river can result in decline of firefly and snail populations because the firefly larvae and their prey snails depend on natural riverine vegetation for survival.

"A lot of people think the berembang tree is enough (for the fireflies) but that's not true as they need the natural habitat to survive," says Kirton.

Female fireflies lay eggs in inland moist soil. Firefly larvae spend a substantial period of their seven-month life cycle in the floodplain before morphing into adults. The common mangrove snail is their main source of sustenance.

Besides habitat loss, Kirton warns that increased utilisation of land for agriculture also poses a threat to the firefly population as pesticide usage in plantations and orchards can harm the fireflies. He points to a survey between 2002 and 2003 that recorded downstream pesticide levels in Sungai Selangor to have exceeded the US Environmental Protection Agency limits for freshwater aquatic organisms.

Paper sanctuary

At the height of the opposition against the construction of the Sungai Selangor Dam (completed in 2002), the survival of the firefly colony at the river mouth was one of the major

concerns. It was feared that extraction of water would reduce freshwater flow downstream and cause salt water intrusion into the estuarine, thus adversely affecting the downstream ecosystem.

The Selangor Government provided a RM1mil grant to the Malaysian Nature Society to assess the environmental impacts of the dam and draft recommendations to mitigate the adverse impacts.

The 16-month study suggested continuous monitoring of the water level downstream, release of sufficient water from the dam during dry periods, establishment of a buffer zone along the river and continuous environmental monitoring. While the impact from the dam has yet to be fully ascertained, it appears that indiscriminate land clearing is threatening the firefly colony of Kuala Selangor.

The socio-economic importance of the fireflies' touristic value had prompted the state to designate the site as a sanctuary and to undergo rehabilitation. The Kuala Selangor Local Plan (2007-2015) notes the need for a 50m river buffer and controlled development within a 400m radius from the river edge.

Securing private land has been highlighted as a vital step towards ensuring the wellbeing of the fireflies but until today, this critical aspect has yet to be resolved. Kirton says the state could acquire the land or provide incentives to land owners to prevent conversion of the land to other uses.

"Currently, land owners who are not direct beneficiaries of the firefly ecotourism do not bother about the effect of leasing or selling their land to oil palm or banana growers. The Government has to channel revenue from firefly watching activities into conservation of the habitat and there must be recognition of the importance of the firefly colony at the community level," he adds.

Bukit Gasing state assemblyman Edward Lee says the district council and land office are currently determining the land status. He agrees that a comprehensive land management scheme is needed to resolve the problem. He says the state is looking into legal provisions for issuing stop-work orders as the affected areas are private land.