

## Distribution of Lyle's Flying Fox (*Pteropus lylei*) Camps in Central Thailand

Lyle's Flying Fox (*Pteropus lylei* Anderson, 1908) is found in Thailand, Cambodia and Vietnam (LEKAGUL & MCNEELY, 1977; CORBET & HILL, 1992). In Thailand, it is restricted to the central plains, the south-eastern region and parts of the peninsula. Typically for the genus, it roosts in permanent "camps", which often contain thousands of individuals. I present here some details on *P. lylei* camps in central Thailand and some notes on the importance of temples to this species.

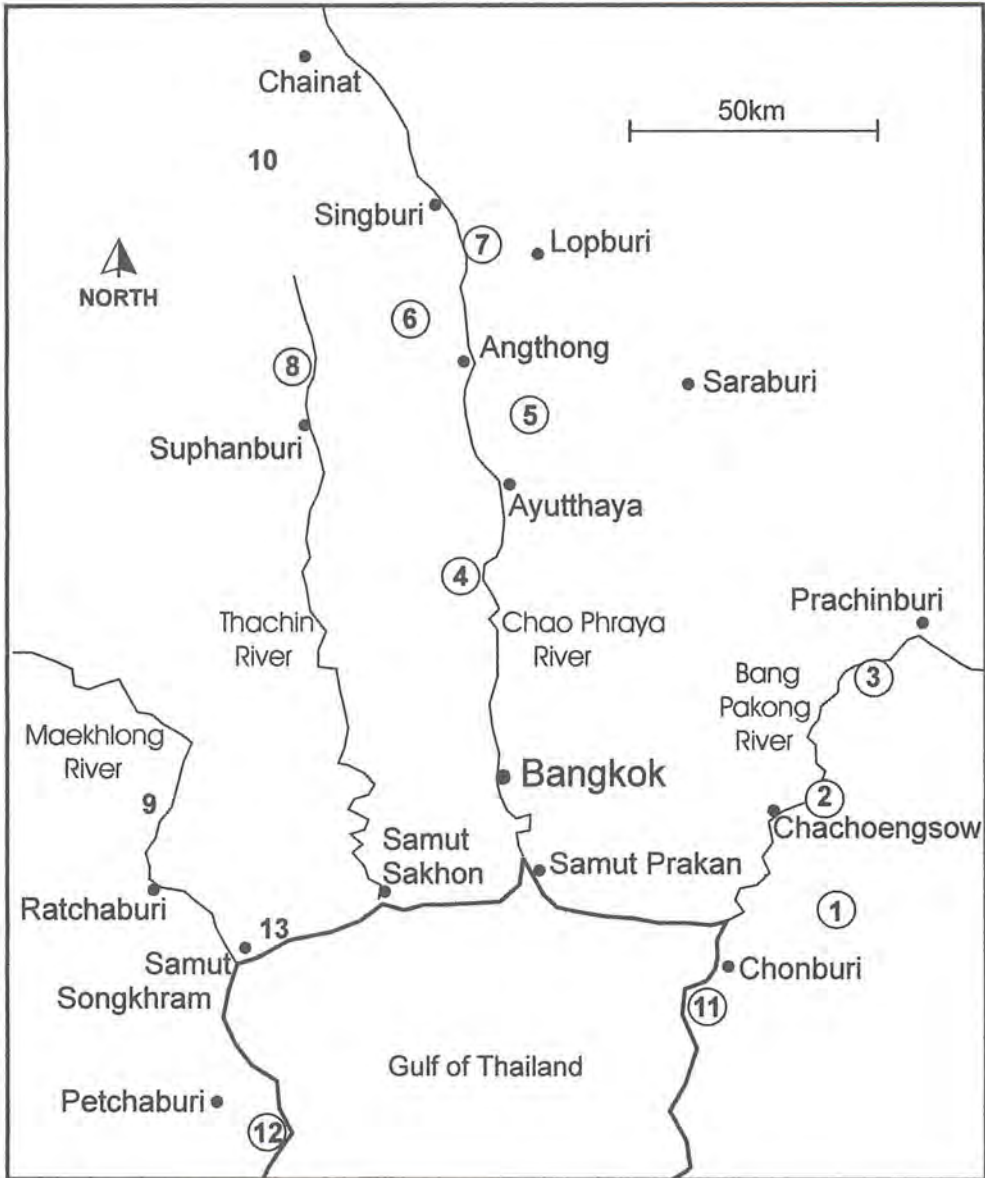
I have confirmed 10 existing *P. lylei* camps, and found 3 sites where flying foxes roosted until relatively recently (Figure 1). Unconfirmed reports were also received of a camp in Saraburi Province and another "near the Cambodian border", plus 2 sites around Bangkok that may be used temporarily by small groups of bats.

The only camp accurately counted was at Wat Chantaram in Angthong Province, which contained 1,450 bats in November 1998. The largest camp was at Wat Pho in Chachoengsao Province with an estimated 7,000–8,000 individuals. This is also the most famous site with many tourists visiting to see the bats.

Of the existing camps, 2 were in coastal mangrove forests (both of which may also have the larger *P. vampyrus*), while the other 8 were in the grounds of Buddhist temples. Camps may exist elsewhere but the importance of temples to this species in Thailand is clear. In many areas of the intensively-farmed plains region, temples are the only remaining sites with suitable stands of sizeable trees. However, a more important reason may be that despite their existing legal protection, flying foxes are often killed by people for food, crop defence, or sport, and temples provide widely available, relatively safe day-roosts. There is some additional legal protection against killing in temple grounds but more significant is the cultural perception that comes through reverence of religious sites. At 2 camps about half of the bats were roosting outside of the temples' grounds but they came under the temples' influence and local residents commented that nobody would harm them mainly out of respect for the abbot. The camp at Wat Tan Aen is within a non-hunting area, but with no permanent official presence on-site, the temple represents a more powerful deterrent to hunters than legal sanction.

Whether the temples or the bats arrived first, the relative security of these roosts must now be an important factor in the continuing presence of *P. lylei*. The role of Thai temples in wildlife protection has been noted elsewhere, for example, for cave bats (ROBINSON & SMITH, 1977), macaques (AGGIMARANGSEE, 1992) and open-billed storks (MCCLURE & KWANYUEN, 1973).

The bats at these temples can cope with some disturbance, for example, I witnessed the colony at Wat Pho remaining in their roosting trees as loud ordination processions passed within 4 m of the lowest roosting bats. However, protecting wildlife is not the main role of a Buddhist temple and flying foxes cannot cope with loss of roosting trees. Of all the permanent camps located, Wat Krabao in Prachinburi Province had the fewest bats (about 800), but until the recent removal of several large trees to accommodate temple

**Temple sites**

- ① Wat Luang Promawaht, Chonburi
- ② Wat Pho, Chachoengsow
- ③ Wat Bang Grabow, Prachinburi
- ④ Wat Ta Song, Ayutthaya
- ⑤ Wat Tan Aen, Ayutthaya
- ⑥ Wat Chantaram, Angthong
- ⑦ Wat Gow Chang, Singburi
- ⑧ Wat Phrao, Suphanburi

**No longer used by flying foxes:**

- 9 Wat Tha Chumphon?, Ratchaburi
- 10 Wat Kangkhao, Chainat

**Mangrove sites**

- ⑪ Ang Sila, Chonburi
- ⑫ Ban Laem Pakbia, Petchaburi

**No longer used by flying foxes:**

- 13 Don Hoi Lawd, Samut Songkhram

Figure 1. Map of *Pteropus lylei* Sites in Central Thailand

expansion there were apparently many more bats using the site. This camp is now split between only 2 trees over 500 m apart, and those bats roosting closest to the main temple buildings are readily disturbed into flight by human activity below. In contrast to the decline of the camp at Wat Krabao, tree-planting at Wat Pho and Wat Chantaram has, at least partly, been aimed at providing additional roosting space for the bats.

Tourism will probably grow at many of these temple sites, which are easily accessible and offer a relatively comfortable wildlife experience. This should be compatible with continued use by *P. lylei* because the bats are already habituated to some level of human activity and, as shown at Wat Pho, they can be tolerant of human movement and noise provided that their roosting space remains undisturbed. The biggest threat from tourism may be frequent deliberate disturbance to display the bats in flight, which already occurs but is a minor problem compared to significant loss of roosting trees through temple expansion.

The mangrove trees that previously harbored flying foxes in Samut Songkram Province were cleared for resort development. Reasons for the disappearance of the bats at the 2 temple sites, both of which retain seemingly suitable trees, are unclear. Some local residents have suggested that it was due to hunting.

The distribution of these camps indicates a possible association with major rivers for the inland sites. Camps also tend to be spaced 25–35 km apart. This information may help any search for other existing sites, and I suggest that the most promising areas for finding further *P. lylei* camps would be along the Thachin River, in Saraburi, and south-east of the Bang Pakong River.

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