

Local knowledge of the Mekong giant catfish at the Sirikit Dam Reservoir, Northern Thailand

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ABSTRACT

Some 103,276 hatchery-reared Mekong giant catfish have been released into the Sirikit dam reservoir from 1984 to 2006. Local knowledge of the catfish was assessed from two fishermen at the reservoir in December 2006 and March 2007. Both fishermen used a gill net to capture the Mekong giant catfish. The experience of one fisherman suggests that the catfish might move around the old channel in the reservoir. The Mekong giant catfish captured in this reservoir by the other fisherman varied from 40 to more than 100 kg in weight. This suggests that the Mekong giant catfish might have grown greatly in the Sirikit dam reservoir and have been a fishery resource around the Sirikit dam reservoir basin.

KEYWORDS: MCTP, *Pangasianodon gigas*, hatchery-reared fish, Empirical knowledge

INTRODUCTION

The Mekong giant catfish is endemic to the Mekong River Basin (Akagi et al. 1996, Rainboth 1996, Hogan 2002). This catfish is one of the largest freshwater fishes in the world, measuring up to 3 m in length and weighing more than 300 kg (Rainboth 1996, Mattson et al. 2002, Hogan 2004). Historically, this species was distributed throughout the basin from China to Vietnam, but it now appears to be limited to the Mekong River and its tributaries in Thailand, Lao People's Democratic Republic (Lao PDR), and Cambodia (Meynell 2003, Hogan 2004). In Southeast Asia, this catfish has been a popular food for the local people, and is one of the most important and high-value fishery species (Akagi et al. 1996). However, the catch number of wild catfish in the Mekong River has declined due to development of the river and over-fishing (Poulsen & Viravong 2002, Hogan 2004). At present, the catfish is listed in the Convention on International Trade in Endangered Species (CITES) Appendix I and on the International Union for the Conservation of Nature and Natural Resources (IUCN) Red List of threatened species as a Critically Endangered Species.

In Thailand, catfish fry were produced using artificial insemination in 1983 (Mattson et al. 2002). The hatchery-reared juvenile and young immature catfish have been released by the government of Thailand (Meynell 2003) into lakes and reservoirs in Thailand as fishery resources for local people. The Sirikit dam reservoir in Uttaradit Province, northern Thailand (Figure 1) is one of these waters, and some 103,276 hatchery-reared fish have been released into this reservoir from 1984 to 2006. The released catfish have grown up in the reservoir and many catfish have been captured by local

fishermen (Figure 2).



Fig. 1. Location of the Sirikit dam reservoir, Uttaradit Province, Northern Thailand.

For effective fishery management, one of the most important studies is to assess the movement patterns of the Mekong giant catfish. The tracking study on the catfish using acoustic telemetry in the Sirikit dam reservoir was requested by the Department of Fisheries, Ministry of Agriculture and Cooperatives of the Government of Thailand. This study was performed within the context of the Mekong giant Catfish Tracking Project (MCTP) to conserve and manage its species (Arai et al. 2005). Prior to the tracking study, local knowledge of the catfish, especially the catfish fishery and its local price, were assessed in December 2006 and March 2007. The assessment of the local knowledge will contribute to the fish tracking using acoustic telemetry in the MCTP, such as to determine the locations of monitoring receivers. We report the local knowledge in this manuscript.



Fig. 2. The photo of the Mekong giant catfish captured at the Sirikit dam reservoir. The photo was on a wall of the restaurant at the reservoir side.

MATERIALS AND METHODS

The area of the Sirikit dam reservoir, Uttaradit Province, Northern Thailand is approximately 237 km². The maximum depth is approximately 80 m near the dam. The outlet of the reservoir is the Nan River, and this river flows through the Uttaradit Province and the Phitsanulok Province.

Local knowledge of the Mekong giant catfish, especially the catfish movement in the reservoir and the catch in weight, were assessed from two local fishermen at the Sirikit dam reservoir in December 2006 and in March 2007. We visited a fish market in Phitsanulok Province, which is next to Uttaradit Province, for the price survey of the catfish.

RESULTS AND DISCUSSION

Local knowledge of the catfish fishery

In the Sirikit dam reservoir, a fisherman used a gill net (mesh size: 30-40 cm) to capture the Mekong giant catfish (Figure 3). The fisherman installed the net across the old channel because he thought the catfish swam along the old channel. Using this method, the fisherman had captured many Mekong giant catfish in this reservoir. More catfish were captured during the rainy season than during the dry season. Our previous study demonstrated that the home range of the Mekong giant catfish was relatively small during the rainy season although little is known about the range during the dry season (Mitamura 2005). Furthermore, the previous study described that the catfish appeared to favor deep areas (Mitamura et al. 2004). The echo-sounder survey showed that the area around the old channel was deep in the reservoir. These suggest that the catfish might move around the old channel in the reservoir.



Fig. 3. A gill net to capture the Mekong giant catfish.

The other fisherman also used a gill net to capture the Mekong giant catfish. The gill net used was stretchy and the mesh size of the gill net varied 5 to 60 cm. The fishermen had captured Mekong giant catfish in this reservoir, and their body weight varied from 40 to more than 100 kg. The catfish were captured especially during May at the beginning of the rainy season. The Mekong giant catfish is considered to show a long-distance migration for spawning in the Mekong River during April to May, and the higher catch during May in the Sirikit dam might be related to their spawning migration.

Price survey of the catfish

One of two fishermen had bought the catfish from other fishermen at the Sirikit dam reservoir and had sold them to the market around the reservoir and at Uttaradit City. Approximately 20 catfish were sold by the fisherman every year, and the price of the fish was 120 Baht / kg. A Mekong giant fish was sold at a fish market in Phitsanulok Province for 150 Baht / kg on 17 March 2007 (Figure 4). This price is relatively expensive, which suggest that the catfish is a valuable fishery resource in northern Thailand. The seller said that this catfish was captured at Nan River, which is the outlet of the Sirikit dam reservoir. The Nan River is the outlet of the reservoir and the catfish might have escaped from the Sirikit dam reservoir.

CONCLUSION

We found that the Mekong giant catfish might have grown to more than 100 kg in weight in the Sirikit dam reservoir and had been a fishery resource around the Sirikit dam reservoir basin. This indicates that Sirikit dam might be suitable for the stock enhancement of the Mekong giant catfish. The Sirikit dam reservoir is quite large (area: approx. 237 km²) and has deep areas (up to approx. 80 m deep). For successful stock enhancement, a large and deep lake or reservoir is suitable similar to the Sirikit dam reservoir. For more effective stock enhancement, the post-release movements, survival rate and suitable release sites should be better understood (Mitamura

et al. 2007). This manuscript shows that the Mekong giant catfish might move around old channel in the reservoir. This will help us to monitor the catfish movement in further studies using acoustic telemetry, such as to determine locations of the monitoring receivers.



Fig. 4. The fish market in Phitsanulok Province, Northern Thailand a) and a Mekong giant catfish sold at the fish market on 17 March 2007 b).

REFERENCES

- Akagi, O., Akimichi, T., Fumihito, A., and Takai, Y. (1996). An ethnoichthyological study of *Pla buk* (*Pangasianodon gigas*) at Chiangkhong, Northern Thailand, *Bull. Nat. Muse. Ethno.* **21**, 293-344.
- Arai, N., Mitamura, H., Mitsunaga, Y., and Viputhanumas, T. (2005). Mekong giant catfish tracking project (MCTP): preliminary results in 2002. In: Spedicato M.T. Lembo G. Marmulla G. (Eds) *Aquatic telemetry; advances and applications*. Rome FAO/Coispa. 125-131.
- Hogan, Z. (2002). Mekong fisheries network newsletter, *Catch and Culture* **7(4)**, 1-19.
- Hogan, Z., S. (2004). Threatened fishes of the world: *Pangasianodon gigas* Chevey, 1931 (Pangasiidae), *Env. Biol. Fish.* **92**, 210.

Mattson, N., S., Buakhamvongsa, K., Sukumasavin, N., Tuan, N., and Vibol, O. (2002). Mekong giant fish species: on their management and biology, *MRC Technical Paper No. 3. Mekong River Commission*. 1-29.

Meynell, P., J. (2003). Scoping study for biodiversity assessment of the Mekong River in Northern Laos and Thailand. *IUCN Mekong water and nature initiative and Mekong wetlands biodiversity conservation and sustainable use program, Bangkok*.

Mitamura, H., Mitsunaga, Y., Arai, N., Tanaka, H., and Thavee, V. (2004). Pilot study on the movement of Mekong giant catfish in the reservoir, *Proc. 4th Int. Symp. SEASTAR2000 and Asian Bio-logging science*. 83-86.

Mitamura, H. (2005). Studies on the behavior of Mekong giant catfish using biotelemetry, *Kyoto University Doctor Thesis*, Kyoto University

Mitamura, H., Mitsunaga, Y., Arai, N., Yamagishi, Y., Khachaphichat, M., and Thavee, V. (2007). Vertical movements of a Mekong giant catfish *Pangasianodon gigas* in Mae peum reservoir, northern Thailand, monitored by a multi-sensor micro data logger, *Zool. Sci.* **24**, 643-647.

Poulsen, A., F., and Viravong, S. (2002). Fish migration and the maintenance of biodiversity in the Mekong River basin, *Catch and Culture* **8(1)**, 1-5.

Rainboth, W., J. (1996). Fishes of the Cambodian Mekong. *FAO*, 153.