Flooded Forests of the Cambodian Mekong

Scientists discover new species and globally important sites in an isolated region of the Mekong River

Heart of Cambodia - The Mekong River

Over 4,500 km long, the Mekong enters Cambodia in the northeast provinces of Stung Treng and Kratie, flowing south through the center of the nation and past the capital, Phnom Penh, before draining into the Mekong Delta. The wetlands of the Cambodian Mekong support a rich assemblage of fish, turtles, crocodiles, waterbirds and other fauna. The river also forms an integral part of Cambodia's culture: Khmer people have depended upon its resources for thousands of years and today, at least one-third of the population is involved in fish capture and sale - Cambodia's inland fisheries are among the largest in the world. Yet like other nations in the Mekong Basin, Cambodia faces a major challenge to balance biodiversity conservation with the needs of its growing human population. Settlement, cultivation, wildlife hunting and infrastructure development are threatening the Mekong's flora and fauna. The need for baseline surveys is urgent: government agencies are hindered in their efforts to identify management priorities, because in many areas little or no information is available on wetland biodiversity.

New biological surveys in Kratie and Stung Treng Provinces

Until as late as the 1990s, parts of this region (see Map) were off-limits to researchers, due to national security concerns over the lingering presence of the Khmer Rouge, who ruled Cambodia from 1975-1979 and later maintained strongholds in Kratie and Stung Treng Provinces. In an unusual twist, the very factors which kept people out also conserved the natural resources. While nearby sections of river were being settled, parts of the region remained almost uninhabited. With the easing of security restrictions in the past decade, new biological surveys were considered timely to identify conservation priorities for the region.

In 2006 and 2007, a team of international specialists together with the Cambodia Fishery and Forestry Administrations, conducted biological surveys over 130 km of the Mekong River in Kratie and Stung Treng Provinces. This was the first detailed survey of this river section, and focused on flora, birds, large mammals, amphibians, reptiles and fish. This section is a tiny fraction (3%) of the total length of the Mekong, yet brief visits by other researchers and available information for nearby areas in Cambodia and Lao PDR, had indicated it could contain some of the most important wetland biodiversity in Southeast Asia.
Populations of rare flora and fauna confirmed

Survey findings exceeded team expectations. The team documented a near-pristine region of tall riverine forest, waterways and island archipelagos, and remarkably, an almost uninhabited section of river, 56 km long, which the team called the "central section" due to its location mid-way between two provincial towns. Many of the team's most exciting discoveries were made in this "central section". The high values of this area arise from a rich and complex mosaic of channel habitats, including numerous waterways, deep pools, rapids, islands, rocky outcrops, and sandbars and beaches hundreds of metres long. Large stands of trees and shrubs grow in the river and each year are completely submerged by the floodwaters, forming unique "flooded forests".

"Corpse plant" discovered

One of the most exciting discoveries was a new species to science, an unusual plant belonging to the group Amorphophallus, known as "corpse plants" because the flowers of many species emit a scent of decaying flesh. The scientific name of these plants is derived from the Ancient Greek amorphous ("without form") + phallos ("phallus"), due to a large club-shaped organ which emerges during flowering. The new species, which has a thin, white stem, is one of the smallest members of the genus (only 10 cm) - a midget compared with its Indonesian relative A. titanum, famed for producing the largest flower in the world (up to 2.5 m long). Specimens were collected on islands in the Mekong River. Further surveys are urgently required to assess whether the species is restricted to these few islands - if so, it may soon become critically endangered by logging and habitat loss. Confirmation of the new species was made by a world expert at the Botanical Gardens of Wageningen University (Netherlands) and is currently being described from specimens collected by the team.

Giant turtles, waterbirds and flooded forests

A host of other exciting discoveries were made. The team captured a bizarre and little-known giant turtle, Cantor's Giant Softshell Turtle, and it appears the region may support the largest population of this species in the Mekong Basin. The largest populations in the world of two waterbirds were confirmed to occur, White-shouldered Ibis and Mekong Wagtail. For the ibis, the study area may support one-quarter (up to 125 individuals) of the world's estimated population of 500 birds. In all, a total of 36 fauna species which are globally threatened and listed under "IUCN Red Lists" were recorded, including breeding populations of endangered storks, herons, fish-eagles and primates. Twenty-three plant species, one fish and one reptile were also new records for Cambodia.

The flooded forests of the study area are some of the most intact and extensive in the Mekong Basin. These "forests" provide essential habitats for many species. In the dry season, animals forage or nest in them, and fish feed on fallen fruits or flowers. In the wet season, the submerged trees and shrubs are used by fish for foraging, breeding and refuge from predators. The lifecycles of many flora and fauna in the river channel are closely linked to the seasonal "flood pulse" of the Mekong, which may rise and fall up to 10 m in three months.

Prior to the surveys, some conservation values were already well-known: the study area supports most of the Mekong's 71 remaining Irrawaddy Dolphins, and in 2006 the threatened Hog Deer was rediscovered near Kratie Town - the only known population in Indochina.
These findings have international implications for conservation: for many species, the loss of populations and habitats from the study area would cause severe impacts to the regional or global status of these species.

**Wetland resources for local livelihoods**

Fish populations in the Mekong River and floodplains in the study area support the protein requirements of over 75,000 people in both provinces: the residents of Kratie and Stung Treng Towns, Sambor and Siemboak District Towns, and over 80 villages. Surveys confirmed that abundant populations remain of many fish species of economic importance, compared with other sections of the Mekong, where some fish populations are declining. These species provide important cash income for many local communities. Shellfish, turtles, frogs and other wetland fauna provide additional food sources. Fish are sold in urban markets and provide food for communities living away from the river and floodplains. The river is also a key transport route for people and wetland products between provinces.

"Central section": the highest priority for management

The "central section" is the most important river section in the study area for management. Surveys confirmed higher biodiversity values in this section than any other area and the most intact natural resources. It is unique compared to all nearby sections of the Mekong, because it supports the region's last remaining riverine forests and lowest human densities. Many kilometers of riverbanks are forested and uninhabited. Due to its abundant natural resources and large areas of unclaimed land, the "central section" provides benefits to many communities in northeast Cambodia. People from over 30 km away visit the area for fishing, logging, wildlife hunting and cultivation. Extensive wetland vegetation remains, and supports fish breeding and nursery habitats which contribute to the health of regional fish populations migrating from the Tonle Sap Lake. Residents report that fish and wildlife populations in the "central section" are higher than in other sections of the Mekong, where populations have declined due to over-hunting or habitat loss.

**Threats**

The "central section" is a small, disappearing pocket in a rapidly developing landscape. Cambodia's new era of peace is enabling communities to migrate to areas previously off-limits due to security concerns, and the human population of the "central section" has increased rapidly in the past 10 years. New immigrants arrive daily, drawn by its unclaimed forests and abundant fish stocks, while villages are expanding. Uncontrolled wildlife hunting, fishing, logging and burning of riverbank forest, and new settlement, are the greatest current threats to this area. Some sites visited by the team in 2006 supported lush forests, but seven months later in 2007 had been entirely burnt and converted to rice fields. Local communities also report that catches of fish, turtles, large mammals and lizards are declining. Commercial wildlife traders are located in the "central section" and sell wildlife to dealers in Kratie and Stung Treng Towns.

Future threats may arise from provincial economic development, such as dam and road construction, and plantations. One dam, Sambor, has been proposed in the study area, which would cause massive impacts to the biodiversity values of the region. With these developments, human populations will increase and add further pressures on the region's natural resources.
Management - urgently needed

Without immediate action, there is a high risk of severe biodiversity loss in the "central section", where the last intact riverine forests and many threatened species reside. **There is a unique opportunity to implement effective action:** impacts only began recently, the "central section" is small, and human densities are still low. In a consultation workshop in February 2008, Cambodian Government representatives and WWF identified the following actions as the most important to save these unique values:

- Designate the "central section" as a "special management site" and divide all lands and water in this site under two zones: a "protection zone", to protect the highest biodiversity values, and a "multiple use zone", to support the livelihoods of local communities.
- Immediately halt all immigration and new settlement until a management strategy is prepared. This is necessary because resources are being lost so quickly.
- Conduct an awareness campaign in villages within 30 km of the "central section" to inform residents that emigration to the "central section" is temporarily prohibited.
- Provide awareness to local communities on Cambodian wildlife laws and the provisional zoning system. Enforce national regulations to halt illegal wildlife trade.
- Support provincial agencies and local communities to manage the natural resources of the "central section", to protect biodiversity values and ensure that fish, timber, and other resources, are secured for local communities.
- Develop a wetland management strategy for the "central section" to address biodiversity conservation, and the livelihoods of local communities.

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