Kinabatangan

Basin countries

Malaysia

Summary of basin characteristics

The Kinabatangan River is the largest and longest river in the Malaysian state of Sabah. It has a main channel length of about 560km, a catchment area of about 16,800km^2 and covers almost 23 per cent of the total land area of Sabah.

Mean annual rainfall in the catchment is between 2,500mm and 3,000mm. Flooding is common along the Kinabatangan, with major flood events causing serious damage to livelihoods and property in 1963, 1967, 1986 and 1996.

The Kinabatangan floodplain is the largest remaining forested floodplain in Sabah and the lower stretches of the Kinabatangan River contain some of the few surviving freshwater swamp rainforests and oxbow lakes in South-East Asia. These evergreen swamp rainforests are of global significance for biodiversity conservation (see below).

Socio-economic importance

The river, used for transport, trade and communication, has been the lifeblood of local people for centuries. Forest products such as edible birds' nests and bees' wax, elephant ivory and hornbill casques were once traded. Nowadays there are about 20 palm oil mills in the Kinabatangan basin, which process the produce from rapidly expanding oil palm plantations. The oil is used in the production of margarine, soap, livestock feed, lubricants, and many other industrial and household products.

Large-scale commercial logging and small-scale farming began along the Kinabatangan in the early 1950s. This provided the people of Sabah with income and employment. Several forest reserves were created in the 1970s, but these were quickly reallocated for agricultural use.

The lower Kinabatangan, with its unique biodiversity, is also increasingly recognized as a destination for ecotourism and local people are becoming involved in this activity.

The key stakeholder groups are:

- Orang Sungai – the local river people – who depend on the river ecosystem for fish, prawns, and forest products including rattan, beeswax, camphor, and edible-nest swiftlet *Aerodramus fuciphagus* nests. There are five main settlements along the lower reaches of the river.
- Oil palm industry – oil palm plantations require only three years to become productive after planting and reach peak productivity after 15 years.
- Ecotourism industry – there are currently five tourist lodges on the river, providing accommodation and wildlife cruises. It is clearly in the interests of the lodge operators to maintain and enhance habitat quality along the river.

Biodiversity values

Some 50 mammal species (including ten primates) and approximately 200 bird species have been recorded in the area. Among these are several distinctive animals that are internationally renowned, such as Asian elephant *Elephus maximus*, orang-utan

Kinabatangan River. WWF-Malaysia / Caroline Pang

Pongo pygmaeus, Sumatran rhinoceros *Dicerorhinus sumatrensis*, and proboscis monkey *Nasalis larvatus*. The forests of the lower Kinabatangan contain the largest concentration of orang-utans in Sabah and are therefore one of the more important populations in the world. Eight of Malaysia's threatened bird species are found in the area, including Storm's stork *Ciconia stormi* and a number of hornbills (family Bucerotidae).

Priority issues for river basin management

At the catchment scale, clearing for agriculture, logging and oil palm plantations has led to loss and fragmentation of forest habitat for wildlife. Water quality has also been declining since the 1960s, when commercial logging started in the upper catchment, and worsened in the 1980s when the oil palm plantations and mills began operations. The main pollution sources in the catchment are effluent from palm oil mills, pesticides, and fertilizers; sediment from plantations; sediment from logging activities; and sewage and refuse from villages along the river.

Logging and land clearance for plantations have also led to significant soil compaction. This, combined with loss of forest cover, increases runoff and exaggerates flooding in the catchment. Conversely, the faster runoff leaves less water available in the watershed to dilute pollution and support navigation.

Land-use conversion, especially clearance for oil palm plantations, has removed the natural forest cover of the lower Kinabatangan floodplain entirely in some places, and elsewhere reduced it to narrow strips. Many species, such as elephants, that previously ranged more widely are now restricted to these narrow riparian corridors, resulting in increased levels of conflict with local people, especially during flood episodes when wildlife moves to higher ground. Efforts are under way to secure legal protection for the remaining forest and to link remaining fragments of forest to provide corridors for wildlife. Due to the removal of natural vegetation cover and upstream development, the oil palm plantations are suffering from the impacts of higher and more frequent floods, with economic losses occurring as a result. Also of concern are the ongoing impacts of water-borne pollution arising upstream.

The Kinabatangan River corridor represents not only a threatened ecosystem in its own right, but provides crucial connectivity between upland forest areas to the south-west and lowland forest blocks to the north-east. However, the corridor is in a tenuous state and without a concerted effort now, the rehabilitation of a natural corridor will be all the more difficult in years to come. In particular, the long-term viability of the habitats and species occurring in the nearby Kulamba and Tabin Wildlife Reserves may be dependent on establishing and maintaining connectivity with the Kinabatangan area.

Role of WWF and its partners

Working in partnership, the Sabah Wildlife Department and WWF have established the 26,000ha Lower Kinabatangan Wildlife Sanctuary. This is intended to protect a floodplain corridor for the conservation of habitats and species, as well as to mitigate the impacts of erosion and flooding. The project has also involved the forging of alliances between conservation and development interests through demonstration of sustainable-use activities that can serve as models for others to follow.

Field actions are focused on conservation and restoration of the meandering lowland section of the river, which is affected by higher peak flows in times of flood due to upstream development. In early 2000, flood damage to young oil palms on one plantation alone was estimated at more than US$1 million. The increased frequency of flood events, and the substantial financial losses incurred, ensured that landowners were willing to discuss restoration of a riparian forest corridor in flood-prone areas.

Since the commencement of the project, a wide range of activities has been carried out. These include: seminars on specific topics related to the Kinabatangan floodplains; studies on pollution, hydrology, tourism, and wildlife management; discussions with plantation owners; and the collection and collation of socio-economic data.

Planned future activities in the lower part of the catchment include:

- Rehabilitating degraded riparian vegetation on the oil palm plantations. This is intended to prevent further riverbank erosion and improve the forest's filtering function, thus limiting sediment

and agricultural chemicals runoff and thereby improving water quality, in addition to boosting the connectivity of wildlife habitats.

- Promoting best practice in management of agricultural chemicals and effluent.
- Studying the economic cost of human-wildlife conflicts. This will focus on Asian elephants and be supplemented by research into patterns of movement and the carrying capacity of fragmented forest blocks.
- Developing an ecotourism 'code of conduct' for the Lower Kinabatangan with the aim of optimizing the economic and social benefits of tourism for local stakeholders.
- Encouraging the planting of traditional wild vegetables, fruits and medicinal plants as an alternative source of food supply and additional income to the villagers, and as incentive to conserve the forest as a source of these products.
- Establishing a Kinabatangan Visitor Centre to support tourism and to serve as a focal point for awareness and education activities.
- Developing Memoranda of Understanding with major oil palm plantations along the Kinabatangan River, aimed at identifying flood-prone areas, unsuitable for oil palm cultivation, to be set aside for natural regeneration and tree planting.

WWF and its partners are now looking to scale up conservation for the whole Kinabatangan catchment. This will include a catchment database, building up towards integrated management of the entire river basin. These plans complement WWF's work in the same area on sustainable forest management, certification and trade.

Conservation method demonstrated

WWF's approach to conservation of the Lower Kinabatangan embraces the entire landscape and river basin. While the Lower Kinabatangan Wildlife Sanctuary has been a focal point, it is also recognized that actions are needed at the level of the river basin so that upstream problems do not manifest themselves as major impacts on the floodplain.

Work with oil palm companies will foster an ethos of environmental protection and responsibility within the decision-making and planning processes carried out by estate managers. With funding already available, engaged and committed partners are identifying potential economic, social and environmental benefits of specific land-use options and practices, seeking 'win-win' options. Benefits to the palm oil companies may include income diversification, improved revenue, reduced costs from unproductive land, enhanced public image and possible expansion into the market for 'green' products. At the same time the project is demonstrating cost-effective and practical solutions to reduce environmental impacts, such as waste minimization, pollution prevention and recycling.

The Kinabatangan River corridor that connects the upland forests with those of north-east Sabah is irreplaceable and a prerequisite for the long-term viability of elephants and rhinos in the state. The current status of the riparian habitat is good to fair; numerous key species are surviving in the area, but there are doubts over long-term viability. The current situation provides grounds for optimism. A constructive working relationship has been established with the oil palm producers adjacent to the fragile, remnant corridor, and advantage has been taken of opportunities from WWF's project work to leverage conservation resources and cooperation from the local community, the government, and the oil palm industry. Conservation efforts are also being coordinated with other non-governmental organizations.

Resources devoted

WWF-Netherlands funds WWF's core work on Kinabatangan through its 'Partners for Wetlands' programme. Funding for supplementary activities has been provided by DANCED, WWF-UK, WWF-France and other sources. The budget for the period 2001-2004 is US$1.3 million, covering the employment of a Project Manager, Communications Officer, Ecology Officer, Socio-economic Officer, Land-use Officer, Project Administrator and field assistants.

Flooded oil palm plantation along the Kinabatangan River. WWF-Malaysia / Caroline Pang

Chronology

1998

- 'Partners for Wetlands – Kinabatangan, Malaysia' initiated in mid-year.

1999

- November: Kinabatangan Wildlife Sanctuary awarded a Gift To The Earth certificate at the WWF Annual Conference in Sabah.

2000-2003

- Activities proceeding on many fronts – see above under 'Role of WWF and its partners'.

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Lessons learnt

1. Stress the economic and social benefits of environmental protection and incorporate this principle into planning and decision-making

2. Base conservation efforts on the value derived by local people
For example, the readiness of oil palm plantation owners to consider floodplain rehabilitation along the lower Kinabatangan is based on the expected economic benefit of reduced losses from flood damage. Responsible, community-based ecotourism centred on wetlands can provide job opportunities while at the same time contributing towards the conservation of water resources and the wider environment. Villagers can become involved in ecotourism by setting up guest-houses, home-stays, restaurants, river transport and tours, and even souvenir shops near tourist areas.

3. Begin with small, feasible projects to create working examples that demonstrate the above principles
These examples can then be expanded and replicated, not only in the immediate project area, but also further afield.

4. Take a strategic and integrated approach, involving a range of stakeholders that are critical for the efficient expenditure of scarce conservation resources
When evaluating the trade-off between devoting resources to the protection of existing natural areas and the restoration of others, four primary factors should be considered: biological importance; the current status of the habitat (and how much effort is needed to achieve conservation objectives); future threat scenarios; and opportunity.

5. Identify and target major stakeholders, but only after gaining full understanding of the conflict patterns (see below) among the resource users so as to avoid alienating important groups
Along the lower Kinabatangan River the oil palm industry is the major player and all habitat protection or restoration activities will involve this sector. After initial hesitance, the industry is open to participating in conservation efforts, including tree planting with commercially viable and flood-resistant tree species.

6. Identify points of conflict
In the case of the lower Kinabatangan, these were between:

- the oil palm industry and local people – few local people are employed in the plantations and all could potentially suffer due to soil or chemical runoff into the river, and users of forest products have suffered when plantations replace natural vegetation
- the oil palm industry and wildlife – significant areas have been converted from forest to oil palm, destroying important wildlife habitat; elephants, attempting to maintain their traditional movements, damage the plantations, eating the shoots of young palms and destroying fences
- wildlife and local people – mainly crop trampling by elephants.

7. Seek local conservation partners
While oil palm does receive much of the conservation attention, there is also work under way with tourism interests and local communities. A non-governmental organization, HUTAN, is carrying out conservation work on orang-utans, with special emphasis on involvement of the local community, in line with WWF's Species Action Plan. The value of this relationship should not be underestimated, and progress under current initiatives would probably be very difficult if there were local opposition.