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GLOSSARY

Kg.; Kampung Village

MTED	Ministry of Tourism and Environmental Development
MOCET	Ministry of Culture, Environment and Tourism ¹
LSWCA	Lower Segama Wetland Conservation Area

For the sake of clarity, in this report *Tidung* (in italics) is used to refer to the *Tidung* community, which is the dominant ethnic group in all three of the lower Segama villages. It does not just refer to residents of Kg. Tidung.

¹ This is the new name of the Ministry of Tourism and Environmental Development which was adopted in 1998.

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Project activities carried out under this component have benefited from the cooperation and assistance of many government organisations, particularly the Sabah Wildlife Department, providing invaluable ground support to the study team. The hospitality and participation of the residents of Kg. Tidung, Kg. Dagat and Kg. Parit in field studies and dialogues has been important to the IPPA studies, and is gratefully acknowledged.

Finally, government representatives at the SBCP-IPPA Final Workshop held on 12 November 1998 are thanked for taking time to listen to and comment upon the Component's final recommendations.

EXECUTIVE SUMMARY

INTRODUCTION

1. The Identification of Potential Protected Areas (IPPA) component of the Sabah Biodiversity Conservation Project (SBCP) investigated geographical zones and habitats considered to be inadequately represented or not present within Sabah's Protected Area system.
2. This document represents the final report on lower Segama. The lower Segama refers in this report to the riverine and wetland forest area between two Wildlife Reserves: Kulamba Wildlife Reserve to the north and Tabin Wildlife Reserve to the south.
3. These two Wildlife Reserves are outstanding in that virtually all of Sabah's large mammal species occur here.
4. The lower Segama comprises mainly logged freshwater swamp forest.
5. As long as natural forest remains, lower Segama represents a corridor that allows the movement of wildlife between the two Reserves.
6. Tabin and Kulamba Wildlife Reserves and adjacent areas are regarded as having a potential for ecotourism, with wildlife as the major attraction.
7. The forest corridor at lower Segama is likely to be lost if proactive steps are not taken to identify and retain a portion of the land for conservation purposes.
8. In order to draw up a proposal for the establishment of a forest corridor, the main additional information necessary was consultation with local residents of lower Segama. Several visits were made to these villages between October 1997 and January 1998 to record the views and perceptions of local residents.

FINDINGS BIODIVERSITY

9. Maintenance of a natural forest corridor along the lower Segama and Tabin Rivers, linking the Tabin and Kulamba Wildlife Reserves, is important to maintain breeding populations of large wildlife species.

SOCIO-ECONOMIC PERSPECTIVE

10. Local residents living near to the proposed forest corridor are almost entirely Muslim Tidung people residing in three villages: Tidung (about 127 inhabitants), Dagat (about 118 inhabitants) and Parit (about 49 inhabitants). These communities rely mainly on fisheries resources for their livelihoods and are affected adversely by any decline in environmental quality.
11. Fishing is seen by residents of Kg. Parit and Kg. Tidung as providing an increasingly insecure future, while agriculture, incorporating both food production and oil palm, is viewed as a more promising basis for the future. Kg. Dagat which is more isolated has access to good fishing grounds at the mouth of the Segama River and Tabin River and fish and prawns are able to provide a reliable source of income.
12. The Tidung community is in favour of retaining forest along the Segama River to maintain the quality of the environment and as a source of forest products.
13. Security of tenure over land is one of the principle concerns of local residents. Education for children and road access to the villages are the two other key concerns of many villagers.

MAIN RECOMMENDATIONS

14. The IPPA component study supports the retention of a forest corridor in the lower Segama to (a) sustain the natural biodiversity of lower Segama, Tabin Wildlife Reserve and Kulamba Wildlife Reserve, and (b) maintain the potential for a diverse economic development of existing resident communities.
15. Benefits to biodiversity conservation from retention of this forest corridor are: (1) security for a large area of contiguous natural habitat to sustain large rare wildlife species and maintain ecosystem continuity; (2) facilitation of regeneration of logged and burned forest in Tabin and Kulamba, as well as within the corridor, by allowing natural seed dispersers to move between and within these Reserves; (3) protection of aquatic biodiversity in the lower Segama River, Tabin River, streams and wetlands.
16. Retention of the forest corridor may potentially benefit local villages by: (1) protecting freshwater fisheries; (2) allowing regeneration of logged forest and future harvest of forest produce by local residents for domestic and community use; and (3) maintaining the option to diversify the local economy (e.g. tourism) beyond oil palm as the sole land use outside the Reserves.

17. In recognition of these wider benefits, the name "Lower Segama Wetland Conservation Area" (LSWCA) is used to refer to the area proposed in this report for the conservation of natural forest.
18. The "Proposed Lower Segama Wetland Conservation Area" (about 3,640 hectares) is shown in Map 1.
19. The width of the corridor has been determined by the need for forest to be of sufficient width to encourage wildlife use; to contain sufficient food species and microhabitats and to include a wider area to compensate for logging impact that has left only a few scattered large trees important for food and refuge.
20. In view of the historical significance of the LSWCA in protecting fisheries and supplying forest products to the Tidung community, and the existence of two burial sites, it is proposed that this area be gazetted under Section 4 of the Cultural Heritage (Conservation) Enactment, 1997.
21. It is suggested that management of the LSWCA be delegated to the Sabah Wildlife Department as this Department is already involved in management of Tabin and Kulamba Wildlife Reserves and is familiar with the area in general.
22. The Wildlife Department should hold dialogues with village residents of Kg. Tidung, Kg. Dagat and Kg. Parit to discuss the LSWCA. A proposal based on this report and on feedback from the villages to be forwarded to the State Cultural Heritage Council.
23. The Wildlife Department should liaise and collaborate with the Tidung community in the lower Segama in order to: (a) develop a management plan for LSWCA; and (b) enable members of the community to play an active role in managing the LWSCA.
24. In order to provide security of land tenure, it is recommended that local residents be given priority to obtain land titles within a zone between the existing Tomanggong Estate and the proposed LSWCA (see Map 1).
25. Kg. Dagat is a suitable location for a station to house staff of the Wildlife Department and the Forestry Department to monitor illegal incursions into the LSWCA and Wildlife Reserves.
26. Kg. Dagat has good tourism potential being situated within one of very few areas in Sabah where it is possible to view large mammals with relative ease.

1. INTRODUCTION

The Identification of Potential Protected Areas (IPPA) component of the Sabah Biodiversity Conservation Project (SBCP) was initiated as follow up to the Sabah Conservation Strategy (SCS 1992) to investigate several geographical zones and habitats considered to be inadequately represented or not present within Sabah's Protected Area system. This document and its Background Papers represent the final report on lower Segama, an area investigated under the IPPA. It contains a review of previous wildlife surveys in this area, an account of IPPA activities carried out in lower Segama, the main findings of specialist studies and recommendations for biodiversity and habitat conservation.

2. BACKGROUND

Extensive conservation areas of natural forest habitat are normally superior to small conservation areas, because large areas can sustain breeding populations of more species. In particular, extensive areas of natural habitat are necessary to sustain populations of large animal species. In the case of Sabah, large rare wildlife species include Asian elephant, Sumatran rhinoceros, tembadau (wild cattle), orang-utan, clouded leopard and honey bear. All these species (and many others) occur in one or both of Tabin Wildlife Reserve and Kulamba Wildlife Reserve (Payne, 1985, 1986), which are situated on the south side and north side respectively of the lower part of Segama River (Map 1). Most of the land between Tabin and Kulamba Wildlife Reserves is currently State land under application for title, covered in logged freshwater swamp forest.

Based on results of surveys of elephant, rhinoceros, tembadau, proboscis monkeys and water birds, and on the endangered status of the orang-utan, recommendations have already been made (see Payne & Andau, 1997; Boonratana, 1996; Rajanathan, 1995, 1997) to retain a forest corridor through the swampy State land between the two Reserves.

An important point noted by Boonratana (1996) is that the natural waterways and the adjacent riverine forests of lower Segama are especially important to large mammals as areas of intensive activity and feeding. Important points recorded by Rajanathan (1995) include the high diversity of primates and bird life, and the finding of footprints of the Sumatran rhinoceros on the north side of lower Segama River (i.e. outside Tabin Wildlife Reserve, the main stronghold of this highly endangered species).

In recent years, several trends have emerged which are relevant to the establishment of a forest corridor through the State land between the two Reserves:

In general, all large wildlife species are coming under increasing pressures, nationwide, as a result of forest conversion to plantations, repeated logging of forest and hunting. For example, the population of proboscis monkeys along lower Segama River declined by roughly 50 percent between July 1995 and September 1996, following intensive logging throughout this area (Rajanathan, 1997).

The clearing of forest along rivers and in wetlands is commonly practised and has contributed to bank erosion and declines in fisheries. The details of this decline have not been documented but the scale can be judged from Peninsular Malaysia, where many fish species of economic value have totally disappeared from river systems where forest has been converted to other use, particularly oil palm plantations. In Sabah, Greer (1998) has shown that streams in the Crocker Range foothills where land use is predominantly forest (including heavily logged forest) maintain aquatic life, while streams in nearby oil palm plantations resemble urban drains and are biologically dead.

Applications have been received by the government to alienate almost all remaining State land throughout Sabah to private ownership for conversion of forest to alternative land use.

The price of palm oil has increased to the extent that swampy, flood-prone land previously regarded as unsuitable for oil palm cultivation (such as that between Tabin and Kulamba Wildlife Reserves) may be suitable and economically viable for this crop if a drainage and bund systems are constructed.

Tabin Wildlife Reserve is regarded as a potential area for ecotourism, with wildlife as the major attraction.

At the Sabah Biodiversity Conservation Project Steering Committee Meeting held on 12 May 1997, the issue of a "forest corridor" between Tabin and Kulamba Wildlife Reserves was raised. It was resolved that the potential of this part of the lower Segama River as a conservation area should be investigated under the Identification of Potential Protected Areas (IPPA) component.

Based on discussions (a) within the IPPA team, (b) with the Director of Wildlife Department and (c) at the Project Coordination Unit meeting held in Ministry of Tourism and Environmental Development (MTED) on 20 October 1997, the following points were noted:

- i) The forest land along the lower Segama River, between Tabin and Kulamba Wildlife Reserves, represents an important "corridor" allowing wildlife to move and genetic exchange between these two Reserves.

- ii) This forest corridor is likely to be lost if proactive steps are not taken to identify and retain a portion of the land for conservation purposes.
- iii) A proposal should be prepared under the Sabah Biodiversity Conservation Project (Identification of Potential Protected Areas (IPPA) component) and submitted to government to recommend that a selected part of the forest land should be reserved.
- iv) There is no specific need to conduct biological fieldwork in lower Segama for purposes of submitting a proposal to government because the argument is for habitat and ecosystem continuity, rather than for preservation of any particular species. Also, some information on wildlife in this area is already available.
- v) In order to draw up the argument for establishment of a Sanctuary/Reserve, the main information now required which is not yet available is the views and perceptions of local native residents (i.e. the residents of Kg. Tidung, Kg. Dagat and Kg. Parit).
- vi) The IPPA anthropologist will conduct a preliminary site visit and, based on that, determine what further work is necessary. After fieldwork is complete, the IPPA anthropologist will submit a report.
- vii) If required, the IPPA team can prepare an outline draft proposal for a sanctuary/reserve, based on a combination of available biological information, the anthropologist's report and available information on current land status in that area.

The above points were recorded in a letter (24 October 1997) from the IPPA chief technical adviser to MTED.

3. OBJECTIVES

The objective of this report is to make recommendations concerning retention of a natural forest corridor between Tabin Wildlife Reserve and Kulamba Wildlife Reserve, Kinabatangan District.

The objectives of the forest corridor are to (a) sustain the natural biodiversity of lower Segama, Tabin Wildlife Reserve and Kulamba Wildlife Reserve, and (b) maintain the potential for a diverse economic development of existing resident communities.

4. METHODS

Available biological studies (Boonratana, 1996; Payne, 1985, 1986; Rajanathan, 1995, 1997) relating to the biodiversity of lower Segama were reviewed.

IPPA field investigation was confined to seeking the views and perceptions of local native residents (i.e. the residents of Kampung Tidung, Kampung Dagat and Kampung Parit).

A preliminary visit to introduce representatives of SBCP (IPPA component biologist and anthropologist, with the sociologist of the Tabin component of SBCP and Wildlife Department staff) was made (21 - 27 October 1997). Further data collection for this report was carried out on a second visit by the same advisers (biologist, 6 - 14 November; anthropologist, 7 - 27 November 1997), with assistance from Wildlife Department. A third visit was made by the IPPA biologist and tourism specialists of MTED (8-11 January 1998).

5. FINDINGS

Based on the existing wildlife studies (Boonratana, 1996; Payne, 1985, 1986; Rajanathan, 1995, 1997) it is concluded that maintenance of a natural forest corridor along the lower Segama and Tabin Rivers, linking the Tabin and Kulamba Wildlife Reserves, is important to maintain breeding populations of large wildlife species occurring in this region.

At least 18 species of birds, including six hornbills, and at least 10 species of mammals which are known to be dispersers of tree and liana seeds have been recorded in the forests along lower Segama River (Rajanathan, 1995).

Results of the investigation of local village communities are presented in a report by the IPPA anthropologist (Lye, 1998).

Some significant results of this investigation are:

- ◆ Local residents living near to the proposed forest corridor are almost entirely Muslim *Tidung* people residing in three villages: Kg. Tidung (about 127 inhabitants), Kg. Dagat (about 118 inhabitants) and Kg. Parit (about 49 inhabitants).
- ◆ The economy of these three villages is traditionally based largely on fishing, with some subsistence farming. However, fishing is seen locally as providing an increasingly insecure future, while agriculture, incorporating both food production

and oil palm, is viewed as a more promising basis for the future. This is less true of Kg. Dagat which is too isolated to market oil palm fruits and does not have large areas of land suitable for agricultural cultivation. This village is close enough to good fishing grounds at the mouth of the Segama River and the Tabin River such that fish and prawns are able to provide a reliable source of income.

- ◆ Traditionally, nearby forests were important sources of materials for boat building, freshwater prawn traps and housing. Due to repeated commercial logging, the remaining forests near to the villages are now barely able to supply these products. The Tidung community is in favour of the retention of forest along the Segama River to maintain the quality of the environment and as a source of forest products.
- ◆ Security of tenure over land is a principle concern of local residents. This is in part because local people know of instances where non-residents have had land applications approved while several households have not been given title to land.
- ◆ Much of the land between Tabin and Kulamba Wildlife Reserves has been applied for, and some applications apparently approved, primarily to people who are not residents of the villages in the area.
- ◆ Education for children and road access to the villages are the two other key concerns of many villagers. The absence of schools and roads at Kg. Tidung and Kg. Dagat exert very major influences on these villages in terms of economic activities and whether families stay or move away.

Recommendations made by the IPPA anthropologist (Lye, 1998, Background Paper 1) include: (1) the resolution of land tenure with priority given to land applications of the existing *Tidung* communities; (2) assistance to these communities in planning for environmental and economic sustainability (alternative economic activities such as agroforestry could be investigated as part of planning); and (3) the establishment of a forest buffer zone between the three villages and Tabin Wildlife Reserve to maintain environmental health and a source of forest resources.

Most significant of the recommendations of the anthropologist's study (Background Paper 1) is that the *Tidung* community should be given an opportunity to play a role in the effective management of a wildlife conservation area. Their involvement could enhance the potential of the lower Segama forest corridor and the adjacent Tabin and Kulamba Wildlife Reserves to better meet their biodiversity conservation objectives.

Local community involvement should be approached as a formalised collaboration between the local community and the government managers of forest conservation areas, within the context of a participatory process of land use planning. In short, the establishment of a wildlife conservation area and the objectives of the community should be jointly- addressed.

6. DISCUSSION

6.1 JUSTIFICATION FOR THE PRINCIPLE OF A FOREST CORRIDOR

There are at least three kinds of biodiversity conservation benefits from retention of a forest corridor between Tabin and Kulamba Wildlife Reserves :

- ◆ Security for a large area of contiguous natural habitat to sustain large rare wildlife species.
- ◆ Facilitation of regeneration of logged and burned forest in Tabin and Kulamba, as well as within the corridor, by allowing natural seed dispersers (e.g. hornbills, fruit bats, pigeons, primates) to move between and within these Reserves.
- ◆ Protection of aquatic biodiversity in the lower Segama River, Tabin River, streams and wetlands.

Retention of a forest corridor between Tabin and Kulamba Wildlife Reserves need not have any adverse impact on local village communities, and may help to support the local economy by:

- ◆ Protecting freshwater fisheries.
- ◆ Allowing regeneration of existing logged forest and future harvesting of forest produce by local residents for domestic and community use.
- ◆ Maintaining the option for a diverse local economy (e.g. tourism) rather than having oil palm as the sole land use outside the Reserves.

The only negative impact of retaining a forest corridor would be to forego development of oil palm in the area retained.

6.2 DETERMINATION OF THE LOCATION AND WIDTH OF THE FOREST CORRIDOR

A forest corridor should be retained to link Tabin and Kulamba Wildlife Reserves in order to achieve the benefits summarised above. The corridor should extend upstream along the length of the lower Segama River in order to help maintain water quality, aquatic life and boat-based tourism potential. How wide should the forest corridor be? Factors influencing choice of an appropriate width for the corridor are outlined below:

6.2.1 Wildlife use

Large mammals such as rhinoceros and orang-utan normally travel and feed only in extensive forest cover. These species may not even use a forest corridor if the width is too narrow.

In addition, forests adjacent to rivers are structurally simple and have a limited array of tree species, which will not provide food, especially fruits, throughout the year. Thus, a riverine corridor which is too narrow is unattractive to wildlife species, particularly species that require specific “microhabitats”. (For example, among the birds, trogons favour deep shade with lianas, while pigeons specialise in fruits).

Furthermore, the lower Segama forests have been greatly disrupted by logging, so that remaining large trees (suitable as main food sources and refuges for birds and primates) are few and scattered. The traditional guideline of 2 chains (about 40 metres) for riverine reserves is certainly much too narrow for such species.

Only a few wildlife species are riverine specialists, but even these species require a broad strip of forest. Proboscis monkeys, for example, are known to range and feed up to about 500 metres from riversides (Bennett, 1986; Boonratana, 1993).

6.2.2 Avoiding edge effects

Studies in South American tropical lowland rainforest have shown that forests less than 100 metres wide are susceptible to dramatic natural degradation due to wind damage and desiccation of sensitive plant species (Laurance, *et.al*, 1997).

6.2.3 Width along the Manalunan river

The upper Manalunan River forms the southern boundary of Kulamba Wildlife Reserve. Some forest cover should be maintained along the southern bank (outside the Wildlife Reserve) but, since this is a narrow river with overhanging trees, and bounded by extensive forest to the north, the Manalunan riverine reserve may be narrower in comparison to the corridor along the Segama and Tabin Rivers.

6.2.4 Local community considerations

A forest corridor should in general not include land with legitimate claims under native customary rights, and should not act to isolate existing village communities from the possibility of road access. Kg. Dagat would be an exception in this case. It is inevitably isolated due to its location east of Tabin River, between Tabin Wildlife Reserve and the Kuala Segama & Kuala Maruap Mangrove Forest Reserve. Even without a forest corridor, this village would remain isolated with boat travel being the most economic means of communication.

Based on the above points, the forest corridor should be as shown in Map 1 ("Proposed Lower Segama Wetland Conservation Area"). The corridor includes a broad "riverine reserve", extending 500 metres from the nearest river bank along both sides of the lower Segama River between Tomanggong Estate and the Kuala Segama & Kuala Maruap Mangrove Forest Reserve and along both sides of the Tabin River outside Tabin Wildlife Reserve. This area is estimated to cover about 3,640 hectares.

6.3 APPROPRIATE NAME, LEGISLATION AND MANAGEMENT AUTHORITY

Although the forest corridor was originally envisaged primarily as a means of supporting wildlife conservation, the retention of forest in the zone shown on Map 1 helps protect a wetland area that supports fisheries and serves as a source of forest produce for local use. In recognition of these wider benefits, the name "Lower Segama Wetland Conservation Area" (LSWCA) is used to refer to the area proposed in this paper for the conservation of natural forest.

Based on information available to IPPA personnel, the proposed LSWCA includes land where land applications have been approved and surveyed. The process of acquiring such land would be complex and have financial implications. In view of the historical significance of the LSWCA in protecting fisheries and supplying forest products to the *Tidung* community, it is proposed that this area be gazetted under Section 4 of the Cultural Heritage (Conservation) Enactment, 1997 (Appendix I).

This Enactment allows management authority to be granted to officers of an appropriate governmental agency. It is suggested that management of the LSWCA be delegated to the Sabah Wildlife Department as this Department is already involved in management of Tabin and Kulamba Wildlife Reserves and is familiar with the area in general. However, the Wildlife Department should liaise and collaborate with the *Tidung* community in the lower Segama in order to: (a) develop a management plan for LSWCA; and (b) enable members of the community to play an active role in the monitoring and management of the LSWCA. This second point is of particular significance because the *Tidung* villages occupy sections of the Segama River which are wildlife use areas but are infrequently patrolled by the Wildlife Department.

6.4 IMPLICATIONS AND MEASURES FOR LOCAL VILLAGE COMMUNITIES

6.4.1 Security of land tenure for Tidung community

The need for security of land tenure is one of the prime concerns of the *Tidung* community. Although detailed information on land status in the study area was not available to IPPA personnel, it is understood that many land applicants from outside the

area have approved land applications while at least some native *Tidung* residents do not own land.

Based on information available to the IPPA team and statements made by local residents, it would seem most appropriate to give priority to local residents to obtain land titles within a zone incorporating Kg. Tidung and Kg. Parit, between the existing Tomanggong Estate and the proposed LSWCA. This area is described in Map 1 as “the approximate area within which priority for land alienation may be given to local residents of Kg. Tidung, Kg. Dagat and Kg. Parit”. The recommended alignment of the proposed Lower Segama Wetland Conservation Area (LSWCA) specifically allows Kg. Tidung and Kg. Parit to maintain and expand their current locations.

Since Kg. Dagat is likely to remain isolated from Sabah's long-term road network, it is proposed that residents of this village are given the opportunity to move to the zone highlighted on Map 1 and acquire title to smallholder lots within that zone.

Assistance should be given to *Tidung* residents to secure land tenure, in parallel with the process of establishing the LSWCA, in order to enhance support for this forest corridor. In addition, local residents could be given exclusive rights of use to the area for harvesting forest products.

The collective benefits of this scheme to the resident *Tidung* community of the lower Segama area include:

- ◆ Option to remain in situ and maintain traditional economic activities if they desire.
- ◆ Option to secure land tenure in a zone where oil palm could be grown and fruits readily harvested, sold and transported via an extension to the existing plantation road network.
- ◆ Development and extension of the villages within this zone would allow the *Tidung* community of lower Segama to enjoy improved access to educational and health facilities, and to market their produce more easily.
- ◆ Option to concentrate crops away from extensive forest cover, thereby tending to reduce damage by wildlife.
- ◆ Option to collaborate with the Wildlife Department in managing and using forest products from the LSWCA.

At least two burial sites exist within the proposed LSWCA (see Map 1). It is suggested that these sites are considered part of the LSWCA, but they might, as a separate process, be demarcated, surveyed and gazetted as cemetery reserves under the Land Ordinance.

6.4.2 Special considerations related to Kg. Dagat

Long-term development prospects

Being isolated, this village is problematic in terms of identifying ways in which the government might enhance its socio-economic welfare. Historically, most Dagat residents originally relocated from Kg. Tidung to avoid recurrent floods. However, the remoteness of Kg. Dagat from buyers of produce, and relatively small size of the land and population makes cash crop agriculture (including oil palm) a doubtful basis for the village's future economy. Due to its proximity to a large Wildlife Reserve, Kg. Dagat will always experience animal pests on crops. From discussions with residents of Kg. Dagat, it appears that ease of access to good fishing grounds is the main advantage to settling in this remote area. Catches are sold in Sandakan and residents of Dagat are able to get good incomes from this activity, so much so that many Dagat households have little need to farm as they are able to buy rice and provisions with their earnings. Fishing may be the only sound basis for the future economy of this community if it remains isolated.

Dagat could remain as a fishing base for individuals who have invested their skills and money into this activity, but there should be no hindrance to the same families obtaining land title for planting oil palm in the Kg. Tidung/Kg. Parit area.

Nevertheless, the opportunity to settle close to Kg. Parit may appeal to only a segment of the Dagat community.

Opportunity to play an active role in conservation

Kg. Dagat is located on the northern boundary of Tabin Wildlife. If the residents of this village are given conservation roles in Tabin and the LSWCA, the strategic location of the village may be made an advantage. Kg. Dagat would be the ideal location for a station to house both officers of the Wildlife Department and the Forestry Department to handle any illegal incursions to the area. Residents of Dagat have said that they would welcome such a station as assistance from Wildlife Department is needed from time to time to handle incidents of human-wildlife conflict.

Tourism potential

Despite the high cost of reaching this area and the lack of previous exposure of the residents to service industries, Kg. Dagat and its environs do have high tourism potential because it is possible to view large mammals with relative ease. The riverside area is scenic and there are opportunities for boat cruises and fishing. This potential should be investigated as part of a strategy of encouraging economic activities that support conservation and enable the distribution of benefits to local communities.

6.4.3 Road link to Kg. Dagat

Villagers of Kg. Dagat are reported to have requested that a road be rebuilt to link Kg. Dagat to Tomanggong Estate. However, this would be difficult to justify both in terms of economics (given the small village population) and of the potential adverse impacts of such a road on bisecting Tabin Wildlife Reserve and the proposed forest corridor.

7. RECOMMENDATIONS

7.1 SECURITY OF LAND TENURE FOR LOCAL RESIDENTS

A zone of land between the existing Tomanggong Estate oil palm plantation and the proposed LSWCA (as suggested on Map 1) to be specifically allocated by government, in which priority is given to local residents of the *Tidung* community of lower Segama (i.e. residents of Kg. Tidung, Kg. Dagat and Kg. Parit) for settlement and grant of land title.

To ensure equitable allocation of land titles, it is recommended that existing land applications be rejected. Instead, the relevant government authorities should decide on the size and configuration of individual family lots, following consultation with the main stakeholders. These consultations might involve leaders of the *Tidung* ethnic community who have no immediate connections with lower Segama, as well as managers of Tomanggong Estate. The latter have relevance in terms of planning and construction of drains and bunds.

ACTION 1

MOCET to write to Lands and Surveys Department and District Office Kinabatangan to: (a) suggest that in general, native residents living in Kg. Tidung, Kg. Dagat and Kg. Parit be given priority over other land applicants in allocation of land and issuance of titles in lower Segama, (b) suggest that the area shown on the map in this report to be allocated preferentially to native residents, living in Kg. Tidung, Kg. Dagat and Kg. Parit, who do not already own land, and (c) draw attention to the points made in the Recommendation above.

Lead agency: MOCET

Supporting agencies: Department of Lands and Surveys, Kinabatangan District Office

Timing: January 1999

**MAP 1: PROPOSED LOWER SEGAMA WETLAND
CONSERVATION AREA**

7.2 CONSULTATION WITH RESIDENTS OF LOWER SEGAMA VILLAGES

The Lower Segama Wetland Conservation Area proposal to be discussed with the residents of Kg. Tidung, Kg. Dagat and Kg. Parit for feedback.

ACTION 2

Wildlife Department to hold dialogues with village residents. The purposes of the "forest corridor", the opportunity for joint management (by villages and Wildlife Department) and the legislation proposed to establish the corridor should be clarified and discussed. Wildlife Department should record views expressed, along with an assessment of the overall response of the villages.

Lead agency: Sabah Wildlife Department

Timing: March 1999

7.3 THE LOWER SEGAMA WETLAND CONSERVATION AREA TO BE PROPOSED AND GAZETTED

A proposal to be forwarded to the State Cultural Heritage Council, based on this report and on feedback from the villages, for establishment of the Lower Segama Wetland Conservation Area (LSWCA).

ACTION 3

Following consultation with residents of Kg. Parit, Kg. Tidung and Kg. Dagat a proposal to be prepared for the establishment of the Lower Segama Wetland Conservation Area.

Lead agency: State Cultural Heritage Council

Supporting agency: Sabah Wildlife Department

ACTION 4

The proposed Lower Segama Wetland Conservation Area (LSWCA; about 3,640 hectares) to be gazetted under section 4(1) of the Cultural Heritage (Conservation) Enactment, 1997. Management of the LSWCA to be delegated to the Sabah Wildlife Department.

Lead agency: State Cultural Heritage Council

Timing: April – August 1999

7.4 DEVELOPMENT OF A JOINT-MANAGEMENT PLAN

The effective use and management of the Lower Segama Wetland Conservation Area will benefit from the participation and involvement of the villages in that area. In addition, opportunities for local communities to derive economic benefits from the establishment of a conservation area, such as through ecotourism, should be investigated and developed.

ACTION 6

Sabah Wildlife Department to liaise and collaborate with the Tidung community in the lower Segama in order to (a) develop a management plan for LSWCA and (b) allow members of the community to play an active role in the use and management of the LSWCA.

Lead agency: Sabah Wildlife Department

Timing: August 1999 onwards

7.5 MONITORING STATION TO BE ESTABLISHED AT KG. DAGAT

Kg. Dagat is situated at the northern boundary of Tabin Wildlife Reserve, which is seldom patrolled. It is recommended that a station to house staff of the Sabah Wildlife Department and the Forestry Department be established at Kg. Dagat for the following purposes:

- (1) to maintain a presence in this area to monitor illegal hunting and logging activities;
- (2) to provide assistance in the event of human-wildlife conflicts;
- (3) to facilitate or carry out wildlife and ecology research;
- (4) to promote community support for wildlife and habitat conservation.

Furthermore, the existence of a settlement in the area would support the running of a station. It is suggested that the station be manned by Wildlife and Forestry staff on a rotational basis (weekly or fortnightly intervals).

ACTION 5

A monitoring station to be established in Kg. Dagat and Wildlife Department staff assigned to serve at the station on a rotational basis for one to two-week periods. The Forestry Department should also assign staff to the station.

Lead agency: Sabah Wildlife Department

Supporting agency: Sabah Forestry Department

Timing: any time

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- 1 Lye, T.P (1998) *Between Reserves and Estates - Report on the land and livelihood concerns of the Tidung people, lower Segama*. Sabah Biodiversity Conservation Project, Identification of Potential Protected Areas component, Technical Adviser Report.

APPENDIX I EXCERPTS FROM THE CULTURAL HERITAGE (CONSERVATION) ENACTMENT 1996

2. “conservation” means the process of looking after a cultural heritage or a conservation area so as to retain its significance, and includes maintenance, preservation, restoration, reconstruction, restoration, reconstruction, adaptation or a combination of two or more of these;

“conservation area” means an area declared as a conservation area under section 4(1);

“cultural heritage” includes any antiquity, historical object, historical site, site, area (whether on land or in the sea), fabric, building, structure, ethnographic matter, work of art, manuscript, coin, currency note, medal, badge, insignia, crest, flag, armour, vehicle, ship and tree, which has a significant and special architectural, aesthetic, historical. Cultural, scientific. Economic, environment or any other interest or value and has been declared to be subject to preservation or conservation under section 4(1).

4. (1) The Yang di-Pertua Negeri may on the recommendation of the Council, but notification in the Gazette, declare –
any cultural heritage the character or appearance of which it is desirable to preserve or conserve, to enhance or to be subject to preservation or conservation; and
any area as conservation area to be preserved or conserved as cultural heritage.

5. The jurisdiction for the control, enforcement, development, preservation or conservation of every cultural heritage and conservation area shall be vested in the State Government.

APPENDIX II LIST OF PLATES

Plate 1. The *Tidung* residents of Kampung Dagat and Kampung Tidung in the lower Segama River area traditionally depend on fisheries to supply the bulk of their livelihood and income. Sustainability of fisheries is supported by the existence of natural vegetation along most of the waterways. This vegetation provides food input (fruits, leaves, insects) for fish and prawn populations. Prawn catches are sold for the Sandakan market.

Plate 2. A woman of Kampung Tidung is making the bottom end of a trap (bubu) for freshwater prawns. The making of these traps takes a significant amount of time and is an activity which is carried out all year round. Note the number of trap parts, made from rattan, in the background.

Plate 3. A view of Kampung Dagat and the surrounding forest. Lower Segama is rich in wildlife, some species of which cause damage to crops. Due to the proximity of Tabin and Kulamba Wildlife Reserves, incursions by wildlife are inevitable. There are good opportunities for viewing rare species such as elephants and tembadau (wild cattle). Tourism, with an emphasis on viewing these species, represents a latent potential worth investigating.

Plate 4. A skillful carpenter at work building a boat under his house at Kampung Dagat, sheltering himself and the unfinished boat from heat and rain. Materials for constructions of boats, prawn traps and houses are obtained from the neighbouring forests. Retaining a forest corridor between Tabin and Kulamba Wildlife Reserves can benefit local residents by protecting nearby forest from commercial logging and loss to plantations, ensuring that future sources of timber are sufficient to meet with their domestic demands.

Plate 5. Healthy and intact riverine forest along the banks on both sides of the Tabin River, outside and north of Tabin Wildlife Reserve. This report recommends retention of a forest corridor along the Tabin and lower Segama Rivers, to a distance of 500 metres from each river bank. Retention of such a forest corridor can benefit not only endangered wildlife, but also the local economy through protection of fisheries and leaving the potential for future tourism and recreational development.

Plate 6. Tenegang Besar River, a tributary of Kinabatangan River, during development of oil palm plantations. Prior to 1994, Tenegang Besar resembled the Tabin River, scenically and in terms of forest plants, and was favourite fishing area for local residents. Now, there are very few fish apart from those often seen floating dead on this river. A 20-metre "riverine reserve" is shown on the maps of Tenegang Besar River, but this has not prevented the damage seen in this picture. Extensive areas of the oil palm planted in 1995 near to this river died during the February 1996 flood and has been abandoned.