Framework for BMP Development and Documentation and BMP on Mitigation of Human - Elephant Conflict (Phase 1)

Prepared for
WWF Malaysia/ WWF Forest Conversion Initiative

by

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WWF Malaysia/ Forest Conversion Initiative BMP Module

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Summary

In line with its objective on the development and adoption of Better Management Practices (BMPs) by the oil palm industry and relevant stakeholders, the WWF Forest Conversion Initiative (FCI) commissioned a study to develop a framework for BMP development and documentation. Based on this generic framework, a scoping exercise was undertaken to assess if there is adequate knowledge and information to produce a pilot BMP guide on mitigating human-elephant conflict in plantations in Indonesia and Malaysia.

A 13-step participatory approach has been developed for the preparation of BMP guides on issues that are relevant to WWF's Target Driven Programmes (TDPs) particularly in respect of conservation of biodiversity and High Value Conservation forests. The BMP process involves the participation and contribution from various stakeholders in the oil palm supply chain. The process is built on the principle of continuous improvement and implementation of the BMP guide would be monitored and reviewed periodically, by the oil palm industry and its stakeholders. Improvements to the BMP practice would be incorporated in revisions of the BMP guide.

The review of literature and experience on human-elephant conflict (HEC) indicates that there is sufficient information to proceed with the development of the pilot BMP guide on mitigation of HEC in Indonesia and Malaysia. The main gaps in formation are in practical experience and advice on effective implementation of various mitigation measures. Additional information required would have to be obtained from a follow-up questionnaire survey, field visits and interviews with those with direct experience in HEC mitigation.

Introduction

Background

Development and promotion of the better management practices (BMPs) by the oil palm industry is one of the three components of the Asia Best Practices module of WWF's Forest Conversion Initiative (FCI). BMPs provide a non-controversial and mutually beneficial platform to leverage industry players towards better environmental performance, while simultaneously increasing the competitive edge for individual companies as well as the industry as a whole. While the industry has over the years developed many sound agronomic and management practices that contribute towards sustainable development, it was recognized that there is scope for improvement in managing conservation-related issues such as conservation and enhancement of biodiversity and protection of high conservation value forests. As these are major concerns for WWF, development and implementation of BMPs has been identified as a priority area for engagement with the industry and accordingly, FCI has commissioned a

project to develop a standard framework for development for BMPs and to apply it in a pilot BMP on mitigating human-elephant conflict.

Objectives

The objectives of the BMP project are:

1. Develop a framework for identifying, housing and monitoring application of better management practices for palm oil production.
2. Compile and review existing information relating to managing and mitigating conflict between humans and elephants in and around plantations, with particular reference to Indonesia and Malaysia.
3. Design a project, in consultation with staff from WWF Malaysia, WWF Indonesia, FCI, and the Asian Rhino and Elephant Action Strategy (AREAS), to quickly and efficiently develop a better management practice for oil palm plantations on mitigation o conflict between humans and elephants.

Outputs

The expected outputs are:

1. A draft framework for oil palm BMP development, dissemination and monitoring.
2. An assessment of information available and any gaps that need to be filled to enable development of a BMP for the oil palm industry on mitigation of conflict between humans and elephants.
3. A proposed project design (including schedule, responsibilities, other organizations interested in collaborating, resources needed and budget) for the rapid development of a BMP for the oil palm industry on the mitigation of conflict between humans and elephants.

Approach

The assignment was undertaken in three modules, in line with the objectives of the project and the outputs are presented under the following headings:

Part A: Framework for development of BMP guide

Part B: Review of literature for the development of the BMP guide on mitigation of human - elephant conflict (HEC).

Part C: Project design for development of the BMP guide on mitigation of human - elephant conflict (HEC) in Phase 2.

During the course of assignment, close liaison had been maintained with Mr Andrew Ng, Senior Scientific Officer, WWF Malaysia to ensure proper alignment of the work to the project objectives. Key personnel from WWF Malaysia (Dr Geoffery Davidson, Dr John Payne), WWF Indonesia (Mr Fitrian Ardiansyah) and WWF FCI (Mr Rod Taylor) were consulted on specific aspects and, in particular, potential sources of information on elephants and HEC. The draft report had also been sent to them for review.

Part A: Framework for Development of BMP Guide

This part consists of two sections, the first being a description of the proposed process for the development of BMP guides. The second section provides information on the physical format and layout for the presentation of the BMP guides and integrating them into a WWF manual on better management practices for the oil palm industry.

A.1 Process for the development of BMP guide

As WWF FCI intends to produce a series of BMPs and publish them as guidance documents for practitioners in the oil palm industry and related stakeholders, it is necessary to establish a process that will involve as many stakeholders as possible and to document and publish the BMP guide in a uniform format. A 13-step process is proposed for a multi-stakeholder approach to develop BMP guides which is shown in Figure 1. The process is based on a Plan-Do-Check-Act cycle that will provide opportunities to improve the BMP practice and guide as WWF and the industry gain experience with time. Brief descriptions of the process steps are as follows:

1. Identification of BMPs

As mentioned earlier, the BMPs shall relate to conservation issues that are relevant to support WWF's Target-Driven Programmes (TDPs), particularly in respect of *Forests for Life, Living Waters and Species* which should be accorded priority. The BMPs should also support the criteria for defining sustainable palm oil by the Roundtable (RT) on Sustainable Palm Oil. Subjects that could considered for the development of BMP guides are given in Table 1 which also indicates the linkage of the BMPs to the proposed criteria for sustainable palm oil (Jennings and Nussbaum, 2004).

The selection of the BMP guides to be developed would be made by WWF FCI, mainly on the basis of the degree of urgency and impact of the practice in supporting specific TDP targets.

2. Preparatory phase – scoping

After selection of the BMP subject, reports, papers, documents and other materials on the subject from relevant WWF projects and other organizations, particularly from the plantation industry should be reviewed and gaps in knowledge information should be identified. The development of the BMP guide could proceed if it is confirmed that the available information can provide the basis for a BMP.

3. Identification of stakeholders and partners

While the development of the BMP guide would be undertaken primarily by WWF FCI personnel and/or consultants appointed by WWF FCI, it may be necessary to enlist the support/assistance of partners who could contribute towards the development of the BMP guide and/or influence producers and other stakeholders in the implementation of the BMP. Potential partners include:

- Those with considerable experience in the BMP topic and can be considered for benchmarks
- Industry associations , representing plantations and small holders

Figure 1: Flow chart for the development and implementation of BMPs

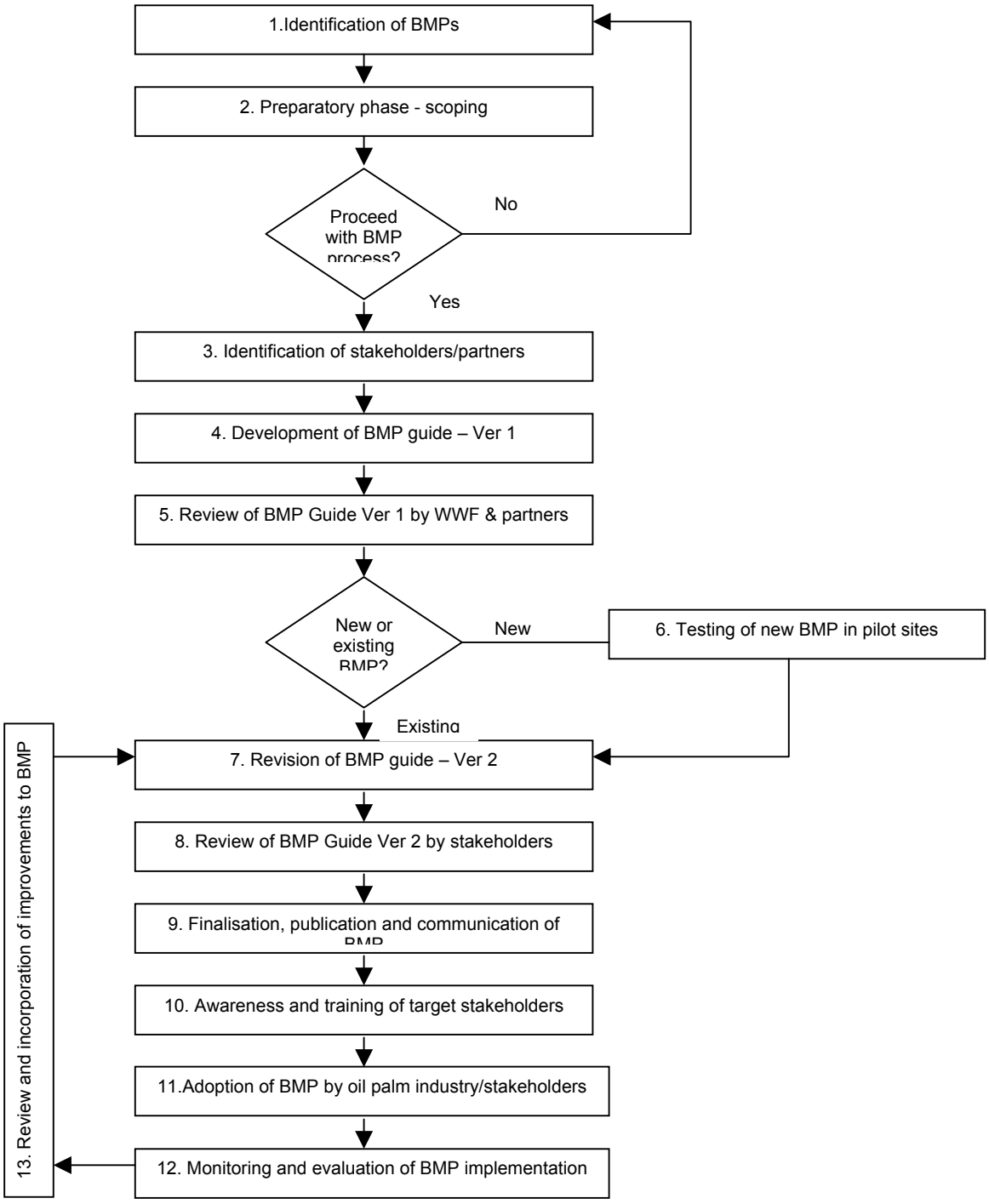


Table 1: Identification of BMP subjects

TDP	BMP Subject	Linkage to RT Criteria
Forests for Life	Conduct of environmental appraisal or Environment Impact Assessment prior to development of new plantations or change of type of crops. Priority to be given to conservation of biodiversity and High Conservation Value forests.	Criterion 6.1. Managing environmental impacts. Criteria 15.1, 15.2, 15.3. Environmental assessment and planning.
	Protection of High Conservation Value Forests (HCVF).	Criterion 15.1. Environmental assessment and planning.
	'Forests-in-Plantations'	Criteria 7.1 and 7.2 Biodiversity and conservation
	Retention of riparian reserves and buffer zones	Criterion 14.1. Site selection and planning. Criterion 15.1. Environmental assessment and planning.
Species	Mitigating human-wildlife conflicts with flagship species – elephant, orang utan, tiger.	Criteria 7.1 and 7.2 Biodiversity and conservation
	Maintaining and enhancing natural biodiversity in plantations..	Criteria 7.1 and 7.2. Biodiversity and conservation
Living Waters	Effective treatment of palm oil mill effluent (POME)	Criterion 8.1 Waste management and energy use
	Soil conservation measures to minimize erosion and contamination by fertilizers .	Criteria 3.2 and 3.3 Soil and Water
	Effective water management in lowland and peat soils	Criteria 3.3. Soil and Water
Climate Change	Zero burning during land preparation	Criterion 8.3 Waste management and energy use. Criterion 17.1. Burning
	Reduction in smoke and particulate emissions from oil mills	Criterion 11.2 Energy and emissions
	Reduction of GHG, especially methane from effluent treatment plants	Criterion 8.2. Waste management and energy use.
	Co-generation of from oil palm biomass and biogas	Criterion 8.2. Waste management and energy use.
Toxics	Integrated pest management practices with minimal intervention with pesticides and minimize health and environmental risks,	Criteria 4.1 and 4.2. Pest control

- Those who may have problems relating to the BMP topic and may be able to offer a site for testing of the new BMP guide.
- NGOs representing key stakeholder groups who have a direct interest or stake in the BMP topic..

Development of the BMP guide is a participatory process that requires the inputs and participation of various stakeholders along the supply chain in the production of oil palm and processing of palm oil. Stakeholders can be grouped according to their functional interests under economic, social, environmental and regulatory aspects. A stakeholder analysis should be undertaken to ensure that all relevant stakeholders are included in the process for developing a specific BMP guide.

4. Development of BMP guide- Version 1

This step requires considerable time and effort. Sources of materials for the content of the BMP guide include:

- Publications, reports and other materials on the BMP topic
- Questionnaire surveys
- Field visits
- Interviews with stakeholders with experience in the BMP or those who have a direct interest or stake in the BMP topic.

All BMP guides should follow the recommended format and layout as shown in Attachment II and the following standard content headings.

- Introduction
- Objectives/Concept
- Definitions
- Relevance of the BMP to WWF TDPs and the definition of sustainable palm oil
- Legal requirements
- Indicators/Standards
- Materials/Equipment
- BMP Procedure
- Examples of effective BMP application
- Implementation of BMP
- Monitoring of BMP implementation
- References

5. Review of BMP guide Version 1 by WWF FCI and partners

This is an internal review step and key questions to be considered include:

- Does the draft BMP guide (Version 1) meet the objectives and expectations of WWF FCI and its partners?
- Does the procedure contain clear and practical guidelines for effective implementation by the target stakeholders?
- Are recommended indicators specific, objective and measurable?
- What are the opportunities for improvement?

6. Testing of new BMP in pilot sites

Guidelines for implementing new BMPs have to been tested and verified before they are released to stakeholders. The method and duration would depend on the complexity of the BMP procedure. Types of tests to determine the effectiveness of the recommended practice include:

- A 'dry run' or simulation of implementation of the BMP guide
- A pilot test on selected key steps in the BMP guide

7. Revision of BMP guide as Version 2

Recommendations for improvement by WWF FCI, its partners and any relevant stakeholders should be incorporated in Version 2 of the BMP guide. In the case of new BMPs, results and experience gained for the tests in pilot sites should also be incorporated.

8. Review of BMP guide Version 2 by stakeholders

The objectives of this step are to get feedback/critique as well as buy-in by various stakeholders along the palm oil supply chain. Activities to be undertaken are:

- Send Version 2 of the BMP guide to all stakeholders identified in Step 3, by e-mail and or fax/post.
- Version 2 should also be posted in the WWF FCI website (as well as a hot link to website of the Roundtable on Sustainable Palm Oil?) to enable any interested party or stakeholder to submit comments or suggestions.
- Stakeholders should send their comments and suggestions electronically or by post by a predetermined deadline.
- Collate all comments and post them on the WWF FCI website.
- Organize an e-conference with stakeholders who had responded to discuss the issues raised by them with the view of trying to resolve differences or opinions or positions as well as to identify opportunities for improving the BMP guide.
- Organize a physical meeting with stakeholders to resolve any contentious issues identified at the e-conference and to strive for common agreement on the contents of the BMP guide.
- Post the proceedings of the e-conference and the physical meeting on the WWF FCI website.

9. Finalization, publication and communication of BMP guide

Recommendations for improvement arising from the e-conference and the physical meeting should be incorporated in the final version of the BMP guide. After confirmation by WWF FCI and its partners, the BMP guide should be published in two formats- hard copy print version and a CD ROM version.

Communication of the BMP guide to stakeholders could include the following activities:

- Official launch at a special function, together with a press conference or press release.

- Announcement in the WWF FCI website.
- Send electronic copies to all stakeholders who participated in the review process; hard copies to be sent to those without e-mail contacts.
- Post the BMP guide permanently on the WWF FCI website , with a hot link to the website of the Roundtable on Sustainable Palm Oil.

10. Awareness and training of target stakeholders

WWF FCI, in collaboration with partners should formulate and implement a programme to raise the awareness of the need for the BMP among various stakeholders, including top management in the oil palm industry and policy makers. Activities could include:

- Publication and distribution of posters and leaflets.
- Briefing sessions.
- Filed visits to pilot sites that have implemented the new BMP procedure or to benchmark organizations that have a good track record in the implementation of specific existing BMPs.

Training should be 'hands-on' sessions for supervisors and those who are responsible for the implementation or BMP procedure. Trainees should be given a thorough understanding on how to implement every step in the BMP procedure in workshop sessions as well as field visits to pilot study sites and/or benchmark organizations. For large companies, it may be useful to train a core of trainers initially.

11. Adoption of BMP guide by oil palm industry and stakeholders

A strategy should be developed to encourage plantations to adopt and implement the recommended BMP practices. To ensure effective implementation, WWF FCI could work in partnership with plantation industry organizations and the Roundtable on Sustainable Palm Oil to incorporate the BMP guides in industry codes of practice or criteria for production of sustainable palm oil. Companies which have been certified to ISO 14001 environment management standards should also be encouraged to include the BMP guides or procedures from these guides into their Standard Operating Procedures or manuals.

12. Monitoring and evaluation of BMP implementation

Two approaches could be considered - self-evaluation and independent assessments by WWF FCI or third parties appointed by WWF FCI.

Self-evaluation would be particularly relevant to members of the Roundtable on Sustainable Palm Oil and signatories to the Roundtable's Statement of Intent (SOI) who have made a commitment to implement sustainable best practices. Initially, a baseline assessment should be undertaken by a company to determine its current performance with respect to the standards established for specific indicators and set targets and action plans to close any identified gaps between the present performance and the desired BMP levels. Progress as well as problems encountered in implementation of the BMPs should be reviewed regularly by senior management. In the case of IS0 14001 certified companies, this should be assessed during the Management Review meetings. Results of the self-evaluation could be published in company annual reports or

environmental reports and websites, particularly among members of the Roundtable on Sustainable Palm Oil.

Periodically, independent assessments should be undertaken to evaluate progress made the plantation industry and other relevant stakeholders in the implementation of specific BMP guides. This evaluation is not intended to be an audit of an individual company's performance. Instead, it should assess the collective effort made the industry and relevant stakeholders to improve their performance in specific BMPs. The assessment could be done by WWF FCI, in collaboration with its partners and/or consultants appointed by WWF FCI.

13. Review and incorporation of improvements to the BMP

Results of monitoring and evaluation undertaken in the previous step should be reviewed periodically (6 months intervals?) by WWF FCI and its partners. Besides the level of implementation of a specific BMP, problems encountered and efforts made to overcome them should also be examined. Underlying reasons or root causes for slow adoption of specific BMPs should be ascertained and appropriate remedial actions should be taken. Improvements made by the plantation industry and relevant stakeholders to any steps in BMP guide should be appropriately recognized and communicated through the WWF FCI website and other media. These improvements should be incorporated into the next revision of the BMP guide; the process for which commences in Step 7.

A.2 Format and layout for BMP guide

Among various approaches considered, WWF Malaysia has agreed that BMP guides be compiled as an A4 size loose leaf manual contained in a 2-ring hard cover file. The manual would consist of two sections; the general introductory section includes:

- A message from WWF FCI
- A forward explaining the rationale and purpose of the BMP guides
- How to use the BMP guides
- Framework for the development of BMP guides.

The second section will consist of individual BMP guides, each guide would be a stand alone publication with a specific reference number (eg BMP Guide No xx/yy/2004). Every page will be identified by:

- Issue No
- Issue Date
- Page No (x of total pages)

BMP guides would be reviewed periodically but only revised or updated pages would be reproduced and sent to stakeholders.

The proposed format and layout for both sections are shown in Attachments 1 and 2.

Part B: Review of Literature for the Development of the BMP Guide on Mitigation of Human – Elephant Conflict (HEC)

Introduction

The primary object of the review of literature is to determine if there is sufficient information for the development of a BMP guide as well as to identify significant information gaps in any aspect of HEC mitigation where further work may be necessary. In line with the scope of the project, the review was focused on experiences on HEC in Malaysia and Malaysia.

Sources of Information

The review process started with a search for documents and publications relating to managing HEC of the Asian elephant in Malaysia and Indonesia. Principal sources of information were:

- WWF Malaysia and WWF Indonesia (Forest Conversion Initiative)
- Asian Rhino and Elephant action Strategy (AREAS) Project 9S0737
- Partners for Wetlands Project MYS 406/98
- Plantation industry publications (*The Planter* and proceedings of national and international seminars and conferences)
- Internet search
- Questionnaire survey
- Personal contacts

As experience on handling HEC in plantations is often not published and is found mainly in the domain of internal company or organizational reports. In order to encourage companies to share their experiences, a simple questionnaire survey was conducted among major companies and organizations in Malaysia and Indonesia, as listed in Table 2, along with their responses. The survey letter and reply form are given in Appendix 1.

Response to the survey had been quite encouraging; overall 61% of those approached replied. Better response was received from companies in Malaysia; 47% (8 companies) stated that they are willing to share their experiences through a questionnaire while 24% (4 companies) reported that have not had problems with elephant intrusions and therefore would not be able to assist in the study. Among the respondents from Indonesia, one company (PT Asian Agri) and the Indonesian Oil Palm Research Institute (IOPRI) expressed their willingness to participate in the follow-up questionnaire survey while four companies stated that they do not have problems with elephant incursions.

Two companies in Malaysia had provided additional information. Kuala Lumpur Kepong Berhad (KLK) gave statistics on elephant damage on two estates in the vicinity of the Labis forest areas in Johore where 2 to 3 elephants have been reported to cause damage to young oil palms. United Plantations Berhad stated their policy on the translocation of encroaching elephants in the 1970s and early 1980s and had offered the availability of their present and former General Managers who had personal experience in implementing their policy.

Table 2: Respondents to the questionnaire survey on development of BMP guideline.

Malaysia			Indonesia		
Company	Replied?	Response	Company	Replied?	Response
1. Asiatic Development Bhd	No		1. PT Astra Agro Lestari	No	
2. Austral Enterprise Bhd	No		2. PT Asian Agri Plantation	Yes	B
3. Boustead Estate Agency	No		3. PT Bakrie Sumatra Pln	Yes	C
4. Consolidated Plantations	Yes	C	4. PT Indo Food Sukses	No	
5. Felda Agricultural Services	Verbal		5. IOPRI	Yes	B
6. Golden Hope Plantations	Yes	B	6. PT Lonsum	No	
7. Hap Seng Consolidated Bhd	Yes	B	7. PT Minanmas Plantations	No	
8. IJM Plantations Bhd	Yes	C	8. Pacific Rim Palm Oil	Yes	C
9. IOI Corporation Bhd	No		9. PT Raja Garuda Mas	No	
10. Kumpulan Guthrie Bhd	Yes	B	10 PT Sawit Mas Group	Yes	C
11. KLK Bhd	Yes	B/E	11. PT SIPEF	No	
12. Kulim Bhd (EPA Mgt S/B)	Yes	B	12. PT Sinar Mas	No	
13. J.A. Russell Sdn Bhd	Yes	B	13. PT SMART	No	
14. Sawit Kinabalu Bhd	Yes	A/B	14. PT Socfin- Indonesia	Yes	C
15. Sarawak Oil Palm Bhd	Yes	C			
16.Tradewinds Bhd	Yes	C			
17 United Plantations Bhd	Yes	B/E			

Key to response:

A We are pleased to enclose the following papers/reports for your reference.
B. We are willing to share our experiences on managing elephant intrusions by participating in your questionnaire survey in the next phase of the development of the BMP.
C. We have never had any problems in any of our estates and thus, we will not be able to assist in the study
D. We regret we will not be able to assist in the study
E. Others

As J.A. Russell & Co Sdn Bhd (owners of Boh Plantations) have been known to support efforts on conservation of elephant, follow-up telephone contact was made with its Executive Director, Ms Caroline Russell on 16th February, 2004 for information on a project on translocation of wild elephants to Taman Negara national park in the late 1990s. The project on satellite tracking of elephants to evaluate the effectiveness of translocation as a management pool was undertaken by the Wildlife and Natural Parks Dept (PERHILITIAN), the Conservation and Research Center of Smithsonian Institute with Boh Plantations as the major sponsor. Unfortunately, Ms Russell does not have any formal reports or publications on the project and suggested that contact be made with Mr Michael Stuewe who was then the researcher from the Smithsonian Institute for the project.

Several members of the WWF network have been contacted for information relatiing to HEC; they included Dr Geoffrey Davidson, Dr John Payne, Ms Lee Shan Kee, Mr Raymond Alfred from WWF Malaysia, Mr Fitran Ardiansyah, WWF Indonesia, Mr Christy Williams, WWF Nepal and MR Michael Stuewe, AREAS. Mr Ajay Desai who was a consultant to WWF Indonesia in August 2002 was also approached for information relating to his report.

Information from Plantation Industry Publications

Publications by members of the plantation industry in industry journals, books and proceedings from planters' conference would be a potential source of information on HEC mitigation. As many of these references are unlikely to be found in the databases of Internet search engines, a physical search was made in proceedings of conferences, books and *The Planter* covering the period from November, 1969 to December, 2003. *The Planter* is the monthly publication of the Incorporated Society of Planters (a professional society of planters with more than 4300 members in 37 countries), containing papers on management and technical aspects of the plantation industry. The list of plantation industry publications examined is given in Appendix 2.

Overall, there were very few publications that dealt specifically with the problems with elephants in plantations; it was usually discussed under the subject of pest management and coverage ranged from a cursory mention to a few pages. Coverage of the industry publications include:

- Biology, population and behaviour of elephants
- Causes of HEC
- Nature of damage and estimates of physical and economic losses
- Mitigation measures, including
  - Barriers (Trenches and electric fencing)
  - Scaring devices
  - Translocation

Publications that are of particular relevance to the preparation of the BMP guide on HEC mitigation include:

- Blair, J.A.S. and Nache M, Noor. (Editors)1979. Incompatible Neighbours: Proceedings of the Workshop on elephant damage held at INPUT January, 1979 .FELDA Institute for Land Development. 249pp.
- Blair, J.A.S. and Nache M, Noor. 1981. Elephant barriers for crop defence in Penisular Malaysia: the FELDA experience. The *Planter,* Kuala Lumpur, 57, 289-312
- Hoh, K.Y. Elephant fence-Lahad Datu Region. Unpublished report. 4pp
- Lu, L.L. 1997. Translocation of the wild jumbos in Sabah. The *Planter,* Kuala Lumpur, 73 (857), 445-448.
- Wood, B.J. 1982. The present status of pests on oil palm estates in South-East Asia. In *The Oil Palm in Agriculture in the Eighties.* Vol II (Pushparajah, E. and Chew, P.S. eds). The Incorporated Society of Planters, Kuala Lumpur. 449-498.

Among the above selected references, the proceedings of FELDA's workshop gave a comprehensive and first hand account of experiences in human-elephant conflicts arising from large scale land development. FELDA (Federal Land Development Agency) is the Malaysian government agency with the socio-economic mandate of developing new land for the rural and landless poor. It started development of oil palm schemes from forest areas in the early 1960s. The workshop was held from 22nd to 26th January, 1979 to discuss the growing concern over elephant incursions and damage to agricultural crops and to design an effective elephant management policy in Peninsular Malaysia. Although the workshop covered various aspects of HEC, much of the time was

spent on presentations and discussions on prevention measures, particularly trenching and electric fencing.

The paper by Blair and Nache (1981) is also comprehensive and provided useful practical advice on erection of elephant barriers based on Felda's experience. The paper gave detailed information, including costing, measurements and illustrations on the construction of trenching and electric fencing which would be useful for the BMP HEC guide.

Lu (1997) gave a pictorial account of the translocation of a wild elephant from Tamaco Estate in Lahad Datu in Sabah to the Tabin Wildlife Reserve in June, 1996. As this was reported to be the first successful translocation of a captive elephant in Sabah by the Sabah Wildlife Dept, it may be useful to contact the author or Tamaco Plantations for more information on the experience.

With regard to novel mitigation measures, a simple device using a fire cracker developed by Jacob(1993) for scaring away wild boar could be adapted for driving away encroaching elephants.

On the underlying causes for HEC, it is of interest to note that the industry had recognised that the conflict had arisen from disruption or fragmentation of the natural habitat of elephants, as reflected in the following quotes:

Such large-scale developments have severely reduced and fragmented traditional elephant ranges (Turner and Gillbanks, 2003).

Elephant damage is very serious. In the last decade, several thousand hectares have been destroyed in jungle edges, where new plantings extend into the traditional territory of herds. (Wood, 1982)

Due to rapid land development and deforestation, the planter and the elephant have come into conflict. (Hoong and Hoh, 1992)

They (elephants) lived along the Kinabatangan, along Sungei Pin Valley, Subak and Sukau, but even here, their feeding ground was being taken over by cocoa, oil palm and rattan plantations. (Mahbob, 2000)

The fate of the elephant dramatises the question of whether our concentration should be entirely on pushing back the frontiers, to the point where natural resource falls below sustainable limits, whilst at the same time it is becoming an increasing problem to efficiently exploit what is already developed. (Wood, 1982)

Information from WWF Projects in Malaysia

WWF work on conservation of the Asian elephant in Malaysia is undertaken mainly by the Asian Rhino and Elephant Strategy (AREAS) Project 9S0737 in collaboration with the Sabah Wildlife Department (SWD). The project in Sabah is part of the AREAS programme in 13 priority landscapes in South Asia and South-East Asia to secure the future of the two flagship species through protecting their habitat and preventing poaching. Conservation of the Asian elephant is also included in the Partners for

Wetlands project (MYS 406/98) with the vision of creating a 'corridor of life' in the Lower Kinabatangan Floodplains. Among other goals, this forest corridor would ensure the survival of the local elephant in the Kinabatangan. Their effort on conservation of elephants and mitigation of HEC is usually done in collaboration with the AREAS project and pother partners such as SWD and HUTAN, a NGO working on research on orang utan and elephant in Sukau in the Lower Kinabatangan. An overview of HEC in the Lower Kinabatangan was presented by Indran (2003) in his paper "Plantation impacts on biodiversity at the MPOA Seminar 2003. Information on elephant population and movements and conflicts with plantations were based on studies by Lee (2002) which are discussed under the AREAS project.

Information from activities of the AREAS project that may be of relevance to the development of the BMP guide are summarised in Figure 2.
AREAS activities in Sabah can be arbitrarily grouped into four categories and brief comments on information available from each group is as follows:

Surveys on HEC

Two questionnaire surveys were conducted during 2001 to assess the HEC situation in selected villages which had HEC experience and among oil palm plantations in the vicinity of the Tabin Wildlife Reserve. Results of these surveys are presented in the following reports:

- Alfred, R.J. 2001a. Socio-economy and elephant conflict study in Lower Kinabatangan river region. AREAS Programme Report. 52 pp
- Alfred, R.J. 2001b. Report on the human-elephant conflict in Tabin Wildlife Reserves. AREAS Programme Report. 11 pp

In the village level survey, questionnaire-based interviews were conducted on 109 local farmers in four villages (Kg Abai, Kg Bilit, Kg. Batu Putih and Kg.Sukau) covering issues pertaining to :

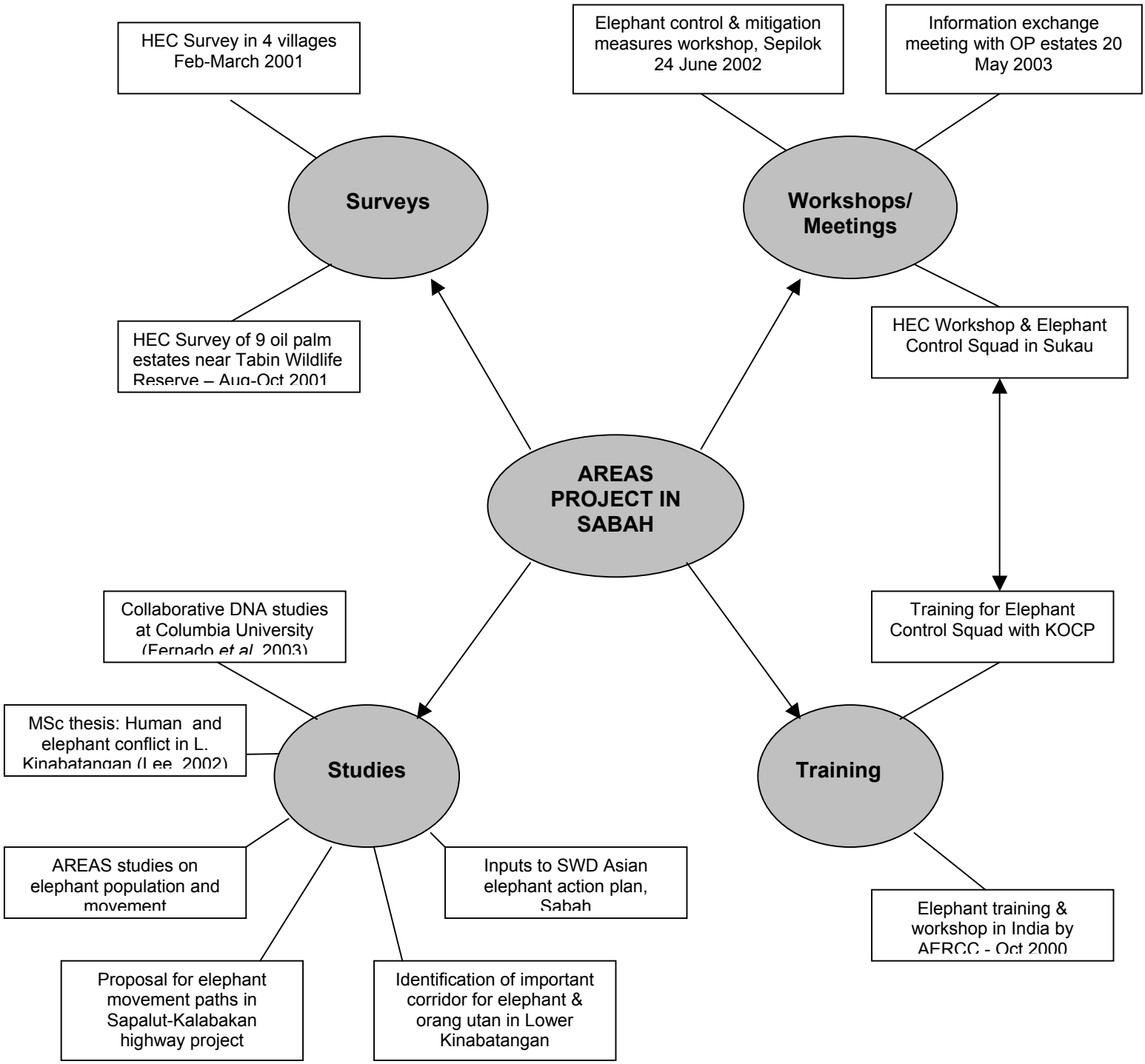
- Crop and property damage
- Attitudes and expectations towards HEC
- Mitigation measures adopted
- Compensation schemes
- Level of participation of villages and oil palm growers towards solving HEC problems

While the survey had yielded useful grass root level experiences and information on the HEC problem among local farmers, Alfred (2001a) states that there were some limitations to the study and had advised caution over interpretation of the survey results. The principal concern was over the accuracy of the results as the sample size was rather limited.

In the survey of HEC in estates around the Tabin Wildlife Reserve, nine oil palm estates with a total planted area of about 30,000 ha provided useful information pertaining to:

- Damage caused by elephants (frequency and duration of raids, time of raids, age of palms damaged)

Figure 2: Information from the AREAS project in Sabah



- Mitigation measures (Types, effectiveness, cost of protection)
- Effectiveness of action taken by SWD towards control of encroaching elephants

It is of interest to note that while reporting of incidences of elephant intrusions to SWD was one of the common measures taken by estates, 50% of those attended to by SWD had stated that the interventions had not been 'really effective' in reducing the elephant conflict problem.

Studies

Among the studies undertaken, those that would be of particular relevance towards preparation of the BMP guide are:

- Fernando, P.,Vidya, T.N.C, Payne,J., Stuewe, M., Davidson, G., Alfred, R.J., Andau, P., Bosi, E., Kilbourn, A and Melnick, D.J. 2003. DNA analysis indicates that Asian elephants are native to Borneo and are therefore a high priority for conservation. PloS Biology, Volume 1, Issue 1, 110-115.
- Lee, S.K. 2002. Human and elephant conflict in the Lower Kinabatangan, Sabah.Thesis submitted for the MSc (Wildlife Management), University Malaysia of Sabah, Sabah. 111pp.

The collaborative DNA study by Fernando *et al* (2003) is of great significance for the conservation of the Asian elephant; it has put to rest the controversy over the origin of the elephant in Borneo. DNA analyses at the Center for Environmental & Conservation, Columbia University confirmed that the Borneo elephant is genetically distinct and should be treated as "a separate evolutionary significant unit."

The post-graduate study by Lee (2002) which was supported by WWF Partners for Wetlands and AREAS is the most comprehensive todate on understanding HEC in Sabah. The study focused on the seasonal movements of elephants and the socio-economic impacts of HEC to cultivated crops in the Lower Kinabatangan. Chapter 5 provided a good discussion on:

- Distribution and patterns of crop raiding
- Distribution and movement of elephants
- Effectiveness of mitigation measures
- Feeding ecology
- Short-term and long-term solutions

Short-term solutions are essentially mitigation measures to prevent intrusions by elephants into crop areas and physical barriers such as electric fencing have been recommended. However, in the long term, the win-win solution would be *in situ* conservation of elephants in the Lower Kinabatangan.

The literature review in Chapter 2 covering the biology and ecology of elephants and conservation status would be useful inputs for preparation of the introductory sections of the BMP guide.

The proposal by Payne and Alfred (2002) on identification of important ecological corridor for elephant and orang utan in the Lower Kinabatangan is also noteworthy as it would contribute towards long term HEC mitigation through restoration of habitats for the elephant.

Workshops and Meetings

The outputs of two stakeholder events are documented in the following reports:

- Alfred, R. 2002. Report on Elephant Control and Mitigation Measures Workshop, Sepilok Resort Centre, Sandakan. 7pp
- AREAS, 2003. Information Exchange Meeting on Oil Palm-Elephant Conflict in Lower Kinabatangan, Sabah, 20th May. 2003.

The workshop in Sepilok presented the findings of AREAS 2-year study on elephants to 35 residents from four villages in the Lower Kinabatangan. The workshop was also designed to obtain participants' views and feedback on managing HEC problems in villages. The main recommendations arising from the workshop were:

- Establishment of Elephant Control Squads
- Translocation of problem elephants
- Erection of electric fencing
- Restoration of habitats or corridors that are critical for elephant movement

The Elephant Control Squad (ECS) is a community-based approach towards minimsing the conflict between elephants and the local community. Through collection of fast and accurate information on elephant movements by the ECS, villagers will be able to take preventive measures before elephant encroachments into the village area as well as crop areas. This proactive HEC mitigation approach is the collective effort among the Kinabatangan Orang Utan Conservation Project (KOCP), Sabah Wildlife Dept and the AREAS project. It should be included as one of the recommended HEC measures in the BMP guide. Information of the establishment of ECS is provided in the report, "Elephant conflict mitigation measures workshop and the elephant control squad in Sukau" by R.J. Alfred (May, 2002).

The Information Exchange Meeting on 20th May, 2003 brought together 16 participants from WWF Malaysia (AREAS and Partners for Wetlands), Sabah Wildlife Dept and management representatives from nine plantation companies to share experiences and views on minimizing the HEC problem in oil palm plantations in the Lower Kinabatangan. The aim is to promote better communications and networking among the affected stakeholders in the region. HEC experiences presented by Asiatic Development Berhad would be a useful input for the preparation of the BMP guide as it provided practical information on construction of preventive measures on electric fencing and trenching, and cost of the preventative measures. It also gave estimates of economic losses suffered through intrusions by elephants. Unfortunately, the full paper was not available as the presentation was on PowerPoint format. It is recommended the follow-up contact be made with Mr Yap Heng Lee, Manager of Asiatic Layang Estate who delivered the paper.

Training

In October, 2000, members of the AREAS project in Sabah attended the Elephant Conflict Workshop (*Elephant-Human Conflict: Its Reasons, Solutions and Costs)* in Bangalore, India organized by the Asian Elephant Research and Conservation Centre. Lessons learned from the Indian experience on HEC mitigation were covered in the AREAS Elephant Conflict Workshop Report dated 30th November, 2000. This included useful practical information on electric fencing in a paper by Krishna Narain, entitled, "Problems and perspectives of electric fencing in Southern India- A decade of field experience" which would be relevant to the proposed BMP guide. Another reference to note is the experience on an insurance scheme as a HEC mitigation measure is" Insurance Scheme for Mitigating Elephant-Human Conflict – A case study in the Gourumara National Park, West Bengal"(Anon). Insurance schemes of this nature might also be applicable towards reducing the economic impact caused by elephants among farmers and the local community in the Lower Kinabatangan.

As mentioned earlier, the establishment Elephant Control Squads (ECS) is a proactive approach towards minimizing encroachment of elephants into village areas and crop land. To be effective, ECS members have to be adequately trained and equipped. Advice on establishment and training of ECS is given in the report," Elephant conflict mitigation measures workshop and the elephant control squad in Sukau" by R.J. Alfred (May, 2002) while training had been undertaken jointly by KOCP and AREAS. Experience from the ECS initiative should be considered for the Training and Awareness segment of the proposed BMP guide.

Information from WWF Projects in Indonesia

HEC effort in Indonesia is focused in the Tesso Nilo lowland forest complex which has been identified as a priority landscape by AREAS. The area has been estimated to have about 700 elephants, possibility the largest population in Sumatra (WWF, 2002). However, in recent times, increasing conversion of forests for development of pulp tree plantations and oil palm plantations as well as illegal logging have put tremendous pressure on the elephant population and it has been seen as the basic cause for HEC in the area, as elucidated by Desai (2002) and Glastra (2003).

Information on HEC in Indonesia is found in the following reports provided by Mr Fitrain Ardiansyah of WWF Indonesia:

- Desai, A. A. 2002. Design of human-elephant conflict mitigation strategy for the proposed Tesso Nil Protected Area, and possible expansion of such strategy into the Tesso Nilo conservation landscape and the Province of Riau. WWF Indonesia Foundation. 43 pp
- WWF Indonesia. 2001. Loss analysis and the perception on human-elephant conflict in companies and community of the Tesso Nilo area. Unpublished report - Project ID 0176.01 report. 14 pp
- Stuewe, M. 2003. WWF AREAS Riau proposed Tesso Nilo National Park, Tesso East-Air Hitam model site: Boundary identification , buffer zone land use and human-elephant conflict mitigation strategy. WWF AREAS draft report. 8pp

- WWF Indonesia. Undated. Human elephant conflict mitigation module. Unpublished report. 10 pp.

The report by Desai (2002) examined the HEC situation in the southern and north-western parts of Tesso Nilo and the underlying factors for conflict and assessed the effectiveness of current mitigation measures. At the onset, he stressed that the HEC problems in Sumatra was the result of large fragmentation and loss the habitat for elephants and this has to be addressed to ensure long term security of the elephant population. The discussion on mitigation measures is of particular relevance for the preparation of the BMP guide. Crop protection measures are grouped as passive or active as follows:

Passive protection:

- Elephant proof trench (EPT)
- Electric fence (EF)
- Oil lamps
- Fire
- Alternate crops

Active protection:

- Guarding crops and patrolling on foot
- Patrolling using vehicles
- Carbide guns
- Driving/chasing away elephants
- Capture and domestication of problem elephants
- Translocation of problem elephants

Overall, HEC mitigation among the local communities had been ineffective as villagers and farmers did not appreciate that crop protection is “an integral part of agricultural practice in an elephant inhabited landscape” and furthermore they do not have the capacity to take appropriate action. Instead, they are dependent on the Government to resolve the HEC problem. The effectiveness of HEC mitigation adopted by plantations (mainly elephant proof trenching, electric fencing or a combination of both) depends on how well they are implemented and maintained. Shortcomings identified for each of the mitigation measures would serve as guides of pitfalls to be avoided in the BMP guide.

On the management of ‘problem elephants’, Desai (2002) stressed the importance of proper identification of such individuals and has provided advice on how to do so. He has also given general guidelines for translocation of elephants which could be considered for the BMP guide.

Desai (2002) has also suggested some new HEC mitigation techniques such as burning of chillies as a deterrent, using pulp wood plantations as buffers between natural forests and plantations and the use of alternate crops to replace oil palm or rubber. However, their effectiveness would have to be proven before they are recommended in the BMP guide.

Establishment of buffer zones between agricultural and forest areas have also been proposed by Stuewe (2003) for the Tesso East - Air Hitam model site of the proposed

Tesso Nilo National Park. He has proposed a phased HEC mitigation strategy for implementation with plantation companies adjoining Tesso Nilo, comprising:

- Short-term programme to "establish, train, equip an elephant chase team that would keep elephants out of community crops".
- Mid-term action to establish electric fence and possibly trenches along boundaries.
- Long term land use plan to "keep acacia next to the forests and oil palm and village fields away from the forests as much as possible".

Information from other sources in Malaysia

Studies and experience pertaining to the Asian elephant by the Wildlife and National Park Dept (PERHILITAN), Sabah Wildlife Dept and other organizations are documentation in local journals such as the Malayan Nature Journal and the Sabah Society Journal as well as conference proceedings. The earlier work on elephant in Peninsular Malaysia had been documented in the Malayan Nature Journal by Mohd. Khan bin Momin Khan who was the Chief Game Warden for Peninsular Malaysia. His papers appeared in Volume 19 (Sept 1965), Volume 20 (March 1967) and Volume 31(1) 1977, covering a wide range of topics on the biology (reproduction, productivity, aging and mortality), population, distribution and movements, particularly in the Upper Perak area, feeding habits and other aspects. In Sabah, De Silva (1968) provided an account of the biology, habits, distribution migration of the elephant in Sabah in the Sabah Society Journal. While the work by Mohd Khan and de Silva had contributed towards a better of the elephant and its behaviour, they of less relevance towards the preparation of the BMP guide, particularly with regard to developing HEC mitigation measures and strategies.

Samarasinghe (2002) had proposed an action plan for the mitigation of HEC in the Lower Kinabatangan. His suggestions were based largely on secondary data and the general action plan appears somewhat theoretical. A more realistic approach for long term survival of the elephant population in Sabah is the Asian elephant action plan formulated by SWD, with inputs from AREAS (Ambu *et al,* 2003?). The plan recommends *in situ* conservation in four Managed Elephant Ranges which would cover more than 90% of the wild elephant population in Sabah. In HEC situations that occur in fragmented populations outside the Managed Elephant Ranges, the preferred and practical solution is translocation of the problem elephants to one of these managed ranges.

Information from the Internet

Results of a Google search for Asian elephants gave a large number of references as shown on the next page.

Key words/Phrases	No. of references
'Asian elephant'	260,000
'Asian elephant' + 'human elephant conflict'	29,100
'Asian elephant' + 'human elephant conflict' +India	18,600
'Asian elephant' + 'human elephant conflict' + Indonesia	11,600
'Asian elephant' + 'human elephant conflict' + Malaysia	9,780
'Asian elephant' + 'human elephant conflict' + Malaysia + 'mitigation measures'	443

As it would be impractical and time consuming to go through all the references, sample pages on mitigation measures were examined for relevant information. While many references from WWF programmes and projects (including AREAS, Partners for Wetlands) and other sources such as PERHILITAN, Sabah Wildlife Dept have been identified in the search, most of the references are unlikely to contribute to towards the preparation of the BMP guide, particularly with regard to specific information on HEC mitigation measures for Malaysia and Indonesia. However, the following publications could be of use.

- Hoare, R. 2003. Fencing and other barriers against problem elephants. AfESG Website HEC Section. Technical Brief Series. 10 pp (PDF). (www.iucn.org/afesg)
- Hoare, R.. 1998. Training package for enumerators of elephant damage. IUCN and Species Survival Commission. 19pp(PDF).
- WWF.2002. Asian elephant. WWF Factsheet. 4pp(PDF) (www.panda.org/species)
- Malaysian elephant satellite tracking project. (www.hrw.com/science/si-science/biology/animals/elephant/eleintro.html)
- Elephants-human conflict: Its reasons, solutions and cost. (Pre-workshop document 2000) (www.yomari.com/areas/resources/pdf/eleph.pdf)

Although the publications by Hoare (1998 and 2003) were based on experience for the African elephant, the practical advice could provide valuable insights for the proposed BMP guide.

Gaps in Information on HEC

Information and papers obtained for this assignment were reviewed within the context of the generic framework for BMP guides that is described in Part A.1 of this report. The aim is to identify any information gaps for which additional inputs must be obtained to allow the completion of the proposed guide on BMP for mitigating human-elephant conflict in oil palm plantations. Comments under each BMP guide content heading are as follows:

Introduction

This section of the guide would provide the rationale and need for a BMP guide on HEC mitigation; it could include an overview of the Asian elephant (status, population, threats etc) and the HEC situation in Malaysia and Indonesia as well as the underlying causes for the conflict. Appropriate print and on-line information would be available from WWF (www.panda.org/species/asian-elephant/) and its projects particularly the AREAS project

(www.worldwildlife.org/areas). Useful references include AREAS booklet, *Securing a future for Asia's wild rhinos and elephants* (WWF, 2002), Fact Sheet on Asian Elephants (WWF, 2003a) and WWF Feature Advisory on Human-Wildlife Conflict (WWF, 2003b). Information on the HEC situation and underlying causes in Malaysia can be obtained from Lee (2002) and Alfred (2001a and 2001b) and in Indonesia from WWF Indonesia (2001), Desai (2002) and Glastra (2003).

Objectives/Concept

There is also sufficient information for this section. The objectives are two-fold to address the human-elephant conflict at the landscape level and at the plantation and community level. Several writers have stressed the importance of a holistic approach at the landscape level for habitat conservation or restoration to ensure the security of the elephant population in the long term. (Desai, 2002, Glastra, 2003 , Samarsinghe, 2002, Lee, 2002) and appropriate mitigation strategies have been developed to achieve this goal (Ambu *et al*, 2003?, Stuewe, 2003, Payne and Alfred, 2002). However, in the short and medium term, for plantations and the local community located in areas where are endemic problems with incursions from elephants, there is a need to put in place effective HEC mitigation measures. This is where the proposed BMP should provide appropriate guidance to the affected stakeholders.

Definitions

This section would provide explanations of technical or unique terms used in this guide. Terms relating to conservation such as High Conservation Value (HCV) and High Conservation Value Forests (HCVF) are readily available eg from the Forest Stewardship Council (www.fsc.org) and the WWF network while definitions for terms relating the HEC (eg 'problem elephant') would have to be developed by the BMP guide consultant/team.

Relevance of the BMP to WWF TDPs and definition of sustainable palm oil

This section provides stakeholders, particularly from plantations, the broader perspective on the need for conservation of flagship species and HCVF. With varying experiences, policies and practices amongst companies who have contact with elephants, this BMP guide could provide a scientific and systematic approach towards ensuring elephant protection with minimum damage to plantations.

Adequate information on relevance to WWF Target Driven Programmes is readily available from print and on-line materials from WWF, particularly from (www.panda.org/about_wwf/how_we_work/tdp.cfm). The definition of sustainable would be based on the criteria being developed by the Roundtable on Sustainable Palm Oil (www.sustainable-palmoil.org).

Legal requirements

Legislation on the status of elephants in Malaysia have been given by Ambu *et al* 2003?, Lee, 2002 and more detailed information would be available from the websites of relevant government agencies, particularly (PERHILITAN,JKAS, NREB, SWD).

With regard to the legal status of elephants in Indonesia, WWF Indonesia's assistance should be sought to obtain the relevant statutes.

Indicators/Standards

Indicators that are commonly used in surveys and studies to gauge the extent and intensity of HEC situations include frequency of wild elephant incursions, extent of damage to crop and property, cost of damage (Alfred, 2001a and 2001b, Desai, 2002, Lee, 2002). These indicators are also appropriate for assessing the effectiveness of HEC mitigation measures

Materials/Equipment

This would be a list of materials and equipment required for implementing various mitigation measures and information would be obtained from the section on BMP procedure.

BMP Procedure

This section is the most important part of the BMP guide as it should provide practical guidance on HEC mitigation measures for plantation staff and the local community. Besides a description of the mitigation measure, the BMP guide should give detailed step-by-step advice, with appropriate diagrams/plans and illustrations on how to apply the measure effectively. Among the mitigation approaches, elephant proof trenches and electric fencing are described in greater detail in publications, particularly by Blair and Nache (1979 and 1981) on FELDA's experience on handling HEC in the 1960s and 1970s. In his survey of mitigation measures adopted in the Riau province in Sumatra, Desai (2002) had given reasons for ineffective application of specific measures and these should be valuable lessons for development of the BMP procedure. Experiences on mitigation measures discussed in the MSc thesis by Lee (2002) should also be considered.

Overall, the publications reviewed do not provide sufficient information for the development of practical guidelines for each mitigation measure. This will be a major challenge for the BMP guide consultant/team who would have to gather additional information through a follow-up questionnaire survey, field visits and interviews with those with direct experience with HEC mitigation measures.

Examples of effective BMP application

It would be useful to include examples, with appropriate illustrations/photos, where HEC mitigation measures have been effectively implemented. Case studies could be identified during field visits by the BMP guide writer/team. A possible candidate for an good example on elephant trenching is Asian Agri Group – Indo Sawit Company which, according to Desai (2002) has the best design for elephant trenches among companies in Sumatra.

Implementation of BMP

The process for implementation would have to be determined by the BMP guide consultant /team. Reference could be made to the process suggested by Desai (2002).

Monitoring of BMP implementation

The process for monitoring of the implementation of the BMP should also be determined by the BMP guide consultant/team, following the general guidelines in Step 12 for the BMP framework (Figure 1).

Part C: Project Design for Development of the BMP Guide on Mitigation of Human – Elephant Conflict (HEC) in Phase 2.

Introduction

Following confirmation in preparatory phase that there is adequate information available for the process on development of the BMP guide to proceed, Phase 2 of the project would cover Steps 3 to 9 of the BMP development flow chart (Figure 1). The major activities to be undertaken are described in the following sections. At the onset, WWF would have to appoint a writer to develop the BMP guide; the appointee could be a staff member or a consultant with experience and /or knowledge in human - wildlife conflict, preferably with respect to elephants.

Identification of stakeholders and partners (Step 3)

As this is the first BMP guide to be developed, it is essential to get the inputs and participation of appropriate partners, particularly for testing the proposed guide in pilot sites in Malaysia and Indonesia. Partners can play either direct roles or through provision of support, sharing and interpretation of data, as well as acid testing of guidelines for practicality or applicability. Potential direct partners in Malaysia are Asiatic Development Berhad and Sawit Kinabalu Berhad, both of whom have on-going working relationship with WWF Malaysia (through MOUs on the Partner for Wetlands project). In Indonesia, it would be desirable to work with partners in the Riau Province where HEC is a major problem. Potential partners should be identified with WWF Indonesia, a potential candidate is the Asian Agri Group (Indo Sawit) which has already its willingness to share its experiences on HEC in response to the questionnaire survey (Table1). It is also a signatory to the Statement of Intent (SOI) of the Roundtable on sustainable Palm Oil.

A stakeholder analysis should be done to identify all those who can contribute towards the preparation and review of the BMP guide; key stakeholder groups to be considered include oil palm plantations, pulp paper plantations, smallholders and the local communities affected by HEC, relevant government agencies (forestry, wildlife) and NGOs.

Development of BMP guide –Version 1 (Step 4)

Activities in this step include:

- Development and conduct of a follow-up questionnaire survey to obtain information on practical experience on HEC mitigation measures.
- Further literature search, particularly from industry sources in Indonesia.
- Interviews with individuals with personal experience in handling HEC problems in Malaysia and Indonesia. Potential candidates are given in Table 3.
- Field visits to gather practical experience on HEC
- Pictorial documentation of good mitigation practices
- Writing of the BMP guide on HEC mitigation.

Field visits are for gathering first-hand information on the HEC problem and observations and documentation on various mitigation measures; priority areas being plantations and

smallholdings/farms in the Lower Kinabatangan in Sabah and around the Tesso Nilo area in Riau Province, Sumatra.

Table 3: Potential candidates to be interviewed

Country	Interviewee	Organization
Indonesia	1. Mr Purwo Susanto 2. Mr Nazir Foead	WWF AREAS Riau
	3. Mr Max Ramajaya 4. Mr Balan Nair	Asian Agri Plantations
	5. Dr Z. Poeleongan	IOPRI
	6. Other candidates to be nominated by WWF Indonesia	
Malaysia	1. Mr Raymond Alfred	WWF AREAS Malaysia
	2. Ms Lee Shan Kee	WWF AREAS Malaysia
	3. Dr Isabelle Lackman -Ancrenaz	HUTAN/KOCP Sabah
	4. Dr Marc Ancrenaz	HUTAN/KOCP Sabah
	5. Mr Laurentius Ambu	Sabah Wildlife Dept
	6. Mr Patrick Andau	Sabah Wildlife Dept
	7. Dr Edwin J. Bosi	Sabah Wildlife Dept
	8. Mr Christopher Hoh	CH Plantation Management
	9. Mr Hoong Hak Wan	Sawit Kinabalu Berhad
	10. Mr Yap Heng Lee	Asiatic Layang Estate
	11. Mr Lu Lip Lai	Ex- Tamaco Planataions Sdn Bhd
	12. Mr Harold Spelwinde	United Plantations Behad
	13. Mr Norman Sta Maria	United Plantations Behad
India	1. Mr Ajay A. Desai	Ajaydesai@hotmail.com

Review of BMP guide Version 1 by WWF and partners (Step 5)

The draft BMP guide should be reviewed by a panel comprising from the WWF network and the representatives of partner organizations. Potential members for the panel could include:

- Dr John Payne, WWF Malaysia/AREAS
- Dr Michael Stuewe, AREAS USA
- Dr Christy Williams , WWF Nepal
- Mr Andrew Ng, WWF Malaysia/FCI Co-ordinator
- Mr Fitran Ardiansyah, WWF Indonesia/FCI Co-ordinator
- One representative from each partner organization in Indonesia and Malaysia

The role of the panel is to ensure that the draft BMP guide (Version 1) meets the objectives and requirements of WWF and its partners and where appropriate, suggest areas for improvement.

Testing of BMP guide Version 1 in pilot sites (Step 6)

Being the inaugural BMP guide, it is necessary to test and verify the advice given in the draft Version 1 in pilot sites in collaboration with the partner organizations. As it would be too time consuming to test the entire range of HEC mitigation measures in the BMP guide, it is recommended that pilot test runs be undertaken for selected key steps or practices in the BMP guide.

Revision of BMP guide –Version 2 (Step 7)

Observations for the pilot tests and recommendations provided by the review panel should be incorporated in the second draft of the BMP guide.

Review of BMP guide Version 2 by stakeholders (Step 8)

Proposed activities in connection with the multi-stakeholder review of the BMP guide on Mitigation of HEC (Version 2) include:

- Despatch to BMP guide Version 2 (electronic and print formats) to all selected stakeholders.
- Compilation of comments and suggestions from respondents, as input for stakeholder meetings.
- Conduct of stakeholder meetings in Indonesia (Riau) and Malaysia (Sabah).
- Prepare and post report/proceedings of stakeholder in WWF website.

Finalization, publication and communication of BMP guide on Mitigation of HEC (Step9)

Recommendations for improvements arising from the stakeholder meetings should be incorporated in the final version of the BMP guide for the approval of the review panel. The BMP guide should be printed according to the agreed format as detailed in Appendix 1.

Schedule for implementation

An action plan for the development of the BMP guide on Mitigation of Human-Elephant Conflict is presented in the Gantt chart in Table 4.

Table 4: Action plan for development of BMP guide on mitigation of human -elephant conflict

ACTIVITY	Month 1				Month 2				Month 3				Month 4				Month 5				Month 6			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1. Appoint BMP guide consultant/team																								
2. Identification of partners and stakeholders																								
3. Develop BMP guide on HEC mitigation																								
3.1 Develop and conduct questionnaire survey																								
3.2 Additional literature search (espec Indonesia)																								
3.3 Interview with selected consultees in Malaysia and Indonesia																								
3.4 Visits to problem and benchmark sites in Sabah and Indonesia																								
3.5 Pictorial documentation of examples of good mitigation measures																								
3.6Writing of BMP guide																								
3.7 Review of BMP guide (Version1) by WWF and partners																								
4.Testing of BMP guide in pilot sites																								
5 Revision of BMP guide (Version 2)																								
6. Review of BMP guide by stakeholders																								
6.1 Despatch of BMP guide (Version 2) to all stakeholders (Electronic format and printed copy)																								
6.2 Compile feedback from stakeholders																								
6.3 Conduct stakeholder meetings in Malaysia and Indonesia																								
7.Finalise BMP guide on HEC mitigation																								
8. Review of final version of BMP guide by WWF and partners																								
9. Publish BMP guide (including editing and proof reading)																								

Budget

It is estimated that the development of the BMP guide would take about 5.5 months , of which about two months would be required to test and verify the guidelines in pilot sites. The estimated cost for running the project, excluding cost of staff time or consultancy fees is about RM 34,300.00, details of which are given in Table 5.

Table 5: Budget for development and production of BMP guide on Mitigation of HEC

Item	Estimated RM
1. Management – Proportionate cost of WWF staff time or cost of consultancy (About xx man-days for the whole project)	To be decided by WWF
2. Travelling and Accommodation	
2.1 Cost of air fares (2 trips each KK-Sandakan and KK-Medan	3600.00
2.2. Ground transportation	1200.00
2.3 Hotel accommodation and meals	3000.00
	7800.00
3. Conduct of stakeholder meetings (Indonesia and Malaysia)	
3.1 Rental of meeting room	1000.00
3.2 Refreshments (50 pax per meeting x 2x RM30.00)	3000.00
3.3 Miscellaneous expenses	500.00
	4500.00
3. Materials and Services	
3.1 Cost of Photostatting	600.00
3.2 Telephone, faxes	500.00
3.2 Postage	200.00
3.3 Cost of printing BMP guides	20000.00
3.4 Miscellaneous expenses	200.00
	21500.00
4. Contingencies	500.00
Total	**34,300.00**

Conclusion

The review of literature and experience on human-elephant conflict (HEC)indicate that there is sufficient information to proceed with the development of the pilot BMP guide on mitigation of HEC in Indonesia and Malaysia. The main gaps in formation are in practical experience and advice on effective implementation of various mitigation measures. Additional information required would have to be obtained from a follow-up questionnaire survey, field visits and interviews with those with direct experience in HEC mitigation.

The preparation of the BMP guide on HEC would follow the 13-step process developed in this study. Based on the project design, the first draft of the BMP guide could be available within 1 ½ months while the final version may take about 5 ½ months as sufficient time must be allocated to test the BMP guide in pilot sites.

Acknowledgement

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