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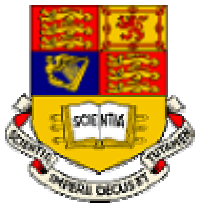

Department of Environmental Science & Technology

Feasibility study for defining an adaptive methodology to assess the poaching threat to tigers in Protected Areas

By

Alison Wadmore

A report submitted in partial fulfilment of the requirements for the MSc and/or the DIC.

November 2002

DECLARATION OF OWN WORK

I declare that this thesis

Feasibility study for defining an adaptive methodology to assess the poaching threat to tigers in Protected Areas

is entirely my own work and that where any material could be construed as the work of others, it is fully cited and referenced, and/or with appropriate acknowledgement given.

Signature: _____

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Name of supervisors: Mr William Sheate
Dr Jaboury Ghazoul

“Whatever you do will be insignificant, but it is very important that you do it.”

- *Mahatma Ghandi*

Courtesy of EIA Website, Updated: 22 March 2000

Khaga Cat Skin Seizure

January 2000, Khaga in the North Indian State of Uttar Pradesh

The largest ever seizure of big cat skins in India and implications for the fight against organised wildlife crime.

In January 2000, police seized 4 tiger skins, 70 leopard skins, 221 blackbuck skins, 18,000 leopard claws, 150 kgs of leopard and tiger bone, 132 tiger claws, 2 leopard teeth and one dried leopard penis from private properties in Khaga in the North Indian State of Uttar Pradesh.

This seizure is one the largest hauls of illegal wildlife products ever recorded in India, indicating a scale and level of organisation within the illegal trade that has shocked Indian authorities and conservation NGO's.

ABSTRACT

The purpose of this research was to undertake a feasibility study determining the possibility of defining an adaptive and predictive methodology for assessing the poaching threat to tigers in Protected Areas. The concept was borne out of a perceived need for a holistic view of the tiger poaching threat worldwide, in order to make better informed choices for targeting investment for maximum benefit. At the core of that vision was the need for a management tool to enable identification and comparison of risk.

The research approach was to use literature research and expert opinion to define a rapid risk assessment framework. The risk factors were then evaluated using standardised questionnaires for data collection across target groups of stakeholders. Having tested the model through fieldwork, the resulting 'scorecards' could be analysed, compared and contrasted. The technique of sensitivity analysis was outlined, for applying weighting to examine the impact of contributing factors.

The results of the research showed that the methodology generally worked and the framework provided a good structure for the risk assessment, though some factors needed refinement with respect to clarity and relation to risk. The conclusion was therefore that this type of rapid risk assessment is feasible and there is value in pursuing the concept.

With regard to future use, the results of this research can be used as a basis for refining and developing the risk assessment framework for application in other Protected Areas. Some preliminary conclusions and recommendations were drawn for Thailand, and the scorecards can now be used as a baseline for ongoing monitoring, where the initial risk factors become success indicators when repeating the assessment over time. The main benefit comes once information is available across many locations; a holistic view can then be taken to identify and address high-risk threats of tiger poaching appropriately, wherever they occur across all Tiger Range States.

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CHAPTER 1. INTRODUCTION

1.1 Background

There are estimated to be less than 5000 tigers remaining in the wild today, down 95% in the last 100 years (EIA website, 2002). Tigers are believed to have evolved from southern China, spreading across Asia as far north as Siberia, as far south as Bali and as far west as eastern Turkey. They have now been reduced to small pockets of their former ranges, often in populations too small and scattered to be viable (Dinerstein *et al.*, 1997). Wild tigers currently inhabit 14 countries, though around half live in India.

There are five remaining subspecies (Amur, Bengal, Indochinese, South China and Sumatran), already reduced from eight (extinct: Bali, Caspian and Javan) with the last extinction as recent as the early 1980s (IUCN/SSC Cat Specialist Group, 2002).

Tigers are solitary, territorial animals, and need space - their territories vary from around 20 to 1000 sq km depending on prey and water availability. Their habitat ranges from the tropical forests of Thailand to the mangrove swamps of Bangladesh to the sparse snow covered landscape of Siberia. They need only water, food (the larger the better to conserve valuable energy between meals) and cover to survive, preferably without disturbance. Yet despite their adaptability, their numbers have plummeted.

The tiger is considered to be an umbrella species because it is the top predator across its numerous types of habitat. It is also considered a flagship species, as its presence indicates a healthy ecosystem. Yet in many of its homelands there is little being done to either research or protect tigers in the wild.

Although revered in many of the cultures of their host countries for centuries – symbols of royalty and divine power in India, in China they represent good against evil, and elsewhere symbols of divine retribution - this has still not afforded them any protection, in fact often the reverse as it seems to inspire a challenge to prove that humans can dominate even the lord of the jungle.

There are huge numbers of tigers in captivity. Despite speculation that it is possible, there have been no successful reintroductions of captive tigers into the wild to date. The instinct to hunt appears to be innate, but the habitat knowledge, where to look for prey, water, shelter from other tigers, is learnt over a two-year period from their mother and is vital for survival. Other notions for use of a captive population include maintaining a gene pool for future use in the wild, but many of the captive tigers are hybrids through poor husbandry practices, and artificial insemination has almost invariably failed to date (Nichols and Ward, 1998), so their only real contribution thus far is through education. The numbers of tigers in the wild are therefore totally dependent upon our whims to save or destroy them, as there are no 'top-ups' available from the captive population.

Many of the countries with wild tigers, often referred to as Tiger Range States (TRSs), are developing countries without a wealth of resources available to conserve tigers. They also have to face incidents of people-tiger conflict, as growing human populations move further into tiger habitat and begin to settle there. A lot of 'tiger money' comes from international donations, but how should and how do projects get selected, when there is such a vast complex web of issues and so many fundamental problems such as poverty, inequality, greed, apathy and indifference to contend with. A number of the factors are now interrelated, such as tiger habitat shared with humans and traditional hunting mixed with consumption by an insatiable wildlife trade, and it seems daunting to take a holistic view to try to invest money for maximum benefit to conservation.

Previous serious threats to wild tigers included years of hunting for sport by the British in India, and a 'vermin extermination' programme by the Chinese under Mao Zedong (Nichols and Ward, 1998), whereby farmers and hunters were paid by the Chinese government on production of a dead tiger. The latter nearly succeeded in eliminating the South China subspecies, which is now the rarest and estimated to be less than 30 individuals in the wild (WWF-UK, 2002). A huge stockpile of bones was created from the eradication programme, and this was used to supply the Traditional Chinese Medicine (TCM) market until it all but ran out in the mid 1980s. Combining a loss of supply with an increased demand, due to rapid growth in per capita wealth in China, caused a boom in the market for wild tigers destined for the TCM trade.

From extensive reading of literature on the subject, the common themes that emerge as key threats for wild tigers at present are:

- Commercial poaching for trading skins, bones and other body parts
- Habitat loss and degradation
- Prey depletion through over-hunting

Looking more closely it is observed that of these three key threats, commercial poaching stands out as being the most serious from the simple perspective of potential rate of decimation (Kenney *et al.*, 1994 and Nowell, 2000). Looking at supply and demand, the presence of multiple consumer groups, primarily the skin trade and TCM market, can only exacerbate the problem as there is a wider range of end users to dissuade. Nearly every part of the tiger's body is traded, meaning large profit and little waste. Different conservation organisations are focussed on various links in the commercial 'chain of custody' to investigate and educate. Progress has been made, from involving local communities in conservation programmes (MacKinnon *et al.*, 1999; Dinerstein *et al.*, 1999 and WWF-Thailand, 2002) through to improvement in trade controls for the TCM market (Hemley and Mills, 1999; Mainka, 1997 and Sellar *et al.*, 1999), but with such a broad consumer base and the significant sums of money involved, it will take a long time to make a

dent in the sheer volume of multiple demand. That demand may have wiped out wild tigers before a solution to poaching, habitat loss or prey depletion can be implemented. Examples of the range of products, shown in **Table 1**, provide an overview of the breadth of the consumer problem.

Table 1. Examples of the range of products from tiger parts, with their uses

Sources: Nowell, 2000; Banks and Doherty, 2002; Project Tiger Website, 2002

Product	Use
Skin	Used as wall displays and rugs; used for accessories and clothing e.g. purses, jackets; small pieces used for relief of fever and as magic amulets and charms
Skulls/Head	Mounted on walls as trophies
Bones	Used in raw form as a powder, also used in making tiger bone pills, adhesive plasters, poultices, massage oils, tonics, wine and whisky; boiled down to gelatin and dissolved in medicinal wine – for a combination of treating illnesses and tonics to improve health and vigour, and reduce stress
Claws	Used as charms, often made into jewellery and ornaments; also used as sedatives
Whiskers	Used as charms, also for toothache
Teeth	Used as charms, often made into jewellery; used in powder to help relieve fever
Penis	Used in making tiger penis pills, wine, soup and tonics to promote sexual virility
Clavicles	Used as neck jewellery as a symbol of power
Gall bladder	Used in mix to treat diabetes
Urine	Used to treat rheumatism
Faeces	Used to treat alcoholism
Fat	Used for treatment of leprosy and rheumatism
Meat	Wild tiger meat considered a powerful health tonic, also for malaria, nausea and stomach toning
Liver	Eaten to impart courage
Stomach	Used to cure an upset stomach
Testis	Used to cure tuberculosis of lymph nodes
Tail	Used for skin diseases
Eye balls	Used for epilepsy, fever in children, and convulsions
Nose	Used to heal dog bites
Brain	Used to heal laziness and pimples

Tigers are protected under the Convention on International Trade in Endangered Species (CITES), with four out of five subspecies listed on Appendix I since 1975 and the Amur being added in 1987 (Nowell, 2000), thereby banning all international trade in live animals or their body parts, yet this has not helped to the reverse the decline in numbers. It has recently been suggested that tigers are being lost from India at a rate of one a day (confidential source, pers. comm., 2002).

There is now a race against time, to try to save the remaining wild tigers from extinction. They are clinging on, but the battle is certainly not won, and at this stage could go either way.

1.2 Project context and positioning

This project was borne out of a sense that whilst there was important work underway to address habitat loss, to study prey depletion and to challenge consumer demand, unless something was proactively focussed on the actual act of poaching then tigers would potentially disappear before the other excellent work had time to deliver.

Whilst there is certainly tiger loss through human-tiger conflict in villages in India, there are also organised bands of tiger traders across Southeast Asia who pay for information on tiger presence, then target particular Protected Areas (PAs) and potentially devastate the tiger populations within weeks. It is the latter case that will have the most dramatic effect upon the tiger's previously gradual downfall. It is also the misunderstanding that the bulk of tiger poaching is through the former rather than the latter case that causes significant risk, as a misleading scenario is dominating communication and may be wrongly prioritised for investment.

It is very important that the full picture be understood, so that the best conservation management strategies are chosen for maximising return on investment. This project aimed to contribute to that by attempting to draw together all factors that are deemed to have a direct effect on the threat of tiger poaching and to populate a 'scorecard' by applying measures to each of these factors. This grid technique is used in identifying and assessing impacts in Environmental Impact Assessments, and a similar approach applied to tiger poaching seemed to provide a logical framework for the serious threat in question.

Having identified this approach, further literature research showed the extent of work in other areas of tiger conservation, but nothing that seemed to address poaching at source across all Tiger Range States. A number of groups such as the Environmental Investigation Agency and TRAFFIC

International were examining on the consumer end of trade and others had gathered some poacher and trader information such as methods and routes, e.g. WildAid in Thailand and Wildlife Protection Society of India, but there was nothing to pull the information together into a holistic view that could be used to prioritise the tiger conservation effort worldwide. Identification of Tiger Conservation Units (TCUs) to protect potential tiger habitat is a very sound strategy, as long as there are still some tigers to live in them.

Tiger products and the trophy trade are indiscriminate of tigers coming from the wild or captivity, therefore even breeding tigers in captivity to supply the market will never stamp out poaching of wild tigers as it will always be cheaper to kill a wild tiger than to raise one in captivity (Banks and Doherty, 2001). Reviewing an example of legalising and regulating trade in an endangered species - this was done with crocodiles: the result brought the trade into the open and reduced the black market, but has not extinguished it as wild populations are desperately sought by traders to reinforce their captive gene pool. In fact, legalisation appears to be more likely to extinguish crocodiles in the wild than the illegal trade, so downlisting tigers from CITES Appendix I to II does not appear to be the answer.

This is a hugely complex area with many issues and no easy answers. Yet large amounts of money are currently being invested in tiger conservation without any obvious form of monitoring success on a worldwide scale. Many companies use the tiger in their corporate image e.g. Esso and Kellogg's Frosties, and even popstars have been using the big cats in PR stunts, e.g. Britney Spears seeking four cheetahs for her stage show (BBC website, 2001) and Victoria Beckham insisting on photographs with a black panther having chosen it as her solo logo (Spice Girls Asia website, 2001). Some corporations have been persuaded to invest money in tiger conservation as a form of Corporate Social Responsibility. It is only right that they should manage this investment with the same rigour as all their other business projects: setting objectives, monitoring progress, and managing spend. To do

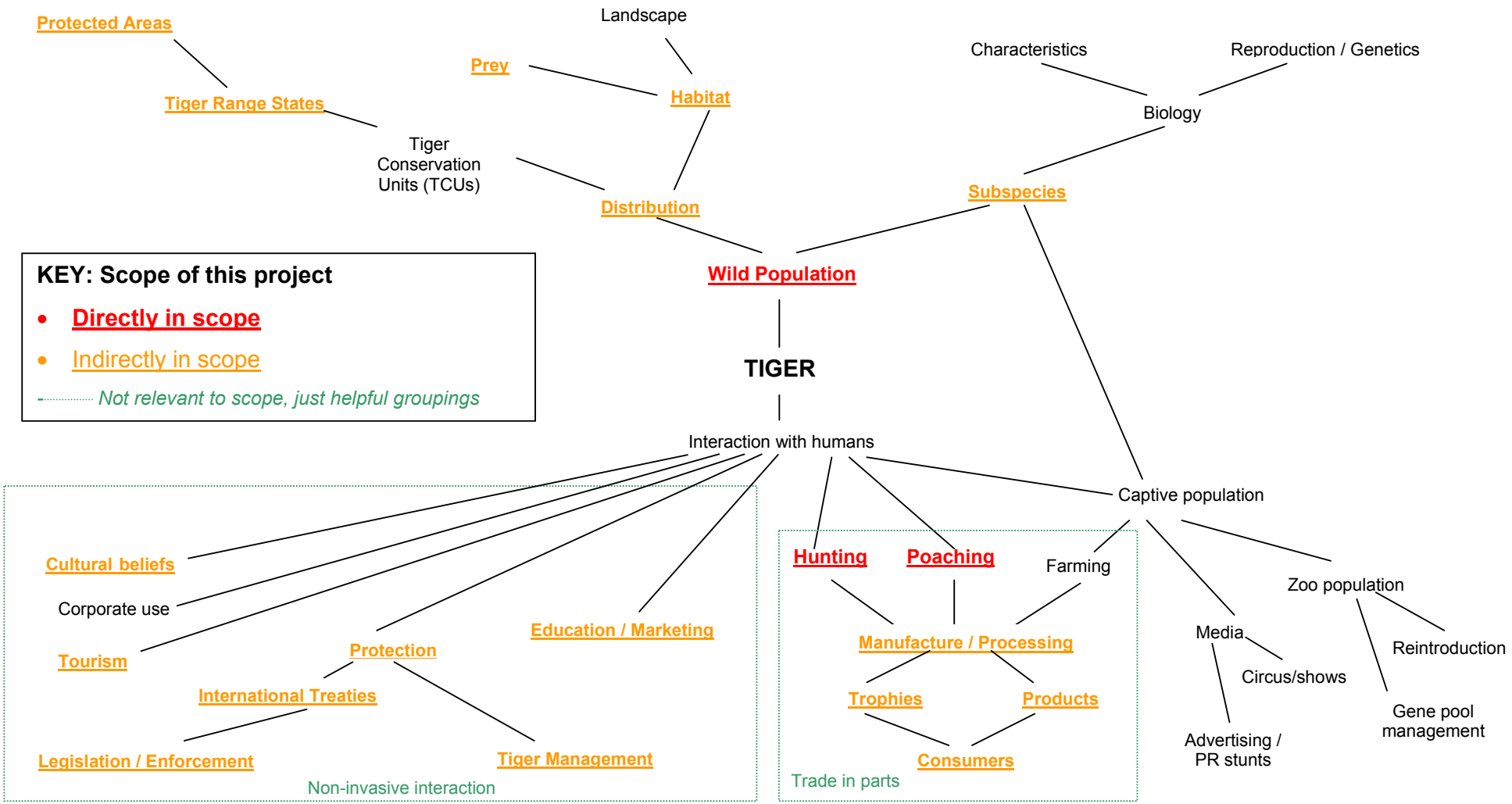
this they need to have a clear view of where their money is being spent and be able to see their part in the overall programme to 'save the tiger'.

A management tool of the type envisioned through this project would help to provide that holistic view, albeit only from the poaching perspective. Understanding in this area could then be integrated with the outputs from other areas of research, e.g. habitat loss, captive breeding, tiger ecology and genetics etc., to build a much needed management overview of the real status of tiger survival and threats worldwide.

Having confirmed that there was an opportune gap for a timely worldwide assessment of risk from tiger poaching, an appropriate approach needed to be determined. Firstly, given the size of the problem it seemed sensible to start with a feasibility study to confirm or deny if there was value in pursuing the concept of a risk assessment tool. Secondly, given that time may be running out for tigers and building a worldwide view of such a complex area takes time, it was decided that the tool should aim at providing a *rapid* risk assessment: a preliminary study of risk to provide a timely baseline status that could be revisited over time for ongoing monitoring. Then, if the feasibility study demonstrated value in having such a tool, plans for the next steps of its use could be initiated, with promotion of the numerous potential benefits.

In order to draw this together, recognise all the current research efforts and to position this project in context, a simple map was drawn (**Fig. 1** overleaf) to assist in clarifying an appropriate scope. A definitive scope statement is included in *Section 1.4*, but essentially, to test the initial concept, this project was a feasibility study for defining an adaptive methodology for assessing the poaching threat to tigers, concentrating on wild tigers poached in situ. Further benefits of having such a management tool are explored in the next section.

Figure 1. Context Map showing tiger research topics relevant to their conservation, and reflecting this project scope



1.3 Project benefits

Having reviewed *what* the project was about, i.e. the background and context in which this project was being conducted, it is important to articulate *why* the project was important i.e. the benefits that this type of concept and approach can bring. It is also important to note that the benefits do not come immediately from this work but will be realised over time, particularly if the intended widespread application is forthcoming. This would involve adopting and applying the risk framework to provide a standardised and comparable view across many Protected Areas in as many Tiger Range States as possible. That way, the pool of information is greater and can better highlight the positive and negative results of investment, or lack of it, with regard to tiger poaching.

The project concept and main output was the provision of a prototype rapid risk assessment tool to evaluate the threat of tiger poaching across PAs and TRSs. Some key benefits over time are anticipated to be using this tool to:

- establish a holistic view for stakeholders, enabling a coordinated strategy for investment in tiger conservation
- establish a standardised baseline for each location, applicable at different levels e.g. at the PA or rolled up to the TRS level
- use the baselines to inform investment choices
- share knowledge of problems and solutions across PAs and TRSs leading to promotion of best practice
- perform gap analysis with regard to data availability and research opportunities
- use baseline assessment criteria as success indicators to enable monitoring of progress over time
- provide an analysis technique for other species facing similar threats.

The following sections covering the scope, objectives and approach describe *how* the project was designed and executed.

1.4 Scope

Given the 4-month project timeframe, boundaries had to be drawn, though it is intended that work will continue if there is interest following this pilot study from those involved in tiger conservation. The overall picture of tiger research and conservation is clearly complex so this smaller scope was chosen to try and prove the feasibility of the concept, ideally leading to future scale-up.

Included in the scope were: *wild tigers* that are *poached* in *Protected Areas*.

- *Poaching* was defined to be those tigers killed either in a planned or opportunistic manner whose parts were then sold into trade.
- *Protected Areas* were defined to be designated National Parks, Wildlife Reserves and Sanctuaries that are formally recognised by the host TRS as a protected area. These were chosen as it was felt that testing this framework concept would be easier in the first instance if performed in a location where indicators could be more easily measured, and this would be more practical to do within the infrastructure of a formal PA.

As mentioned previously, poaching was selected as it is believed that the potential rate of impact of this particular threat outweighs other main threats such as loss of prey base or habitat. Only those factors that are likely to have a direct impact on poaching of tigers were included.

Excluded from scope were poaching incidents of wild tigers outside Protected Areas. It is noted that many Tiger Conservation Units go beyond PAs, but it is expected that these would be considered as part of a future scale-up of the model. Also, there are many factors that have an indirect impact on tiger poaching, such as rate of habitat loss, but these were not measured in their own right unless a direct link to poaching was identified.

1.5 Project objectives

In order to determine the feasibility of the concept, the project objectives were as follows:

- Define a generic methodology and management framework for performing a rapid risk assessment of the tiger poaching threat in PAs, which could be adapted for use across all TRSs.

  The resulting tool was intended to be useable by wildlife staff and consultants to
  - identify and evaluate risks at a high level, in order to focus resources and to share solutions once comparative information is available
  - provide baseline indicators of success that can be measured over time
  - be used to influence relevant policy with regard to park management, wildlife trade monitoring and CITES enforcement

- Test the methodology and framework in one or more PAs

- Present the results firstly in terms of the methodology expressed around a framework of key measurable factors, and secondly with findings from the pilot PAs

- Examine the implications and applications of such a concept

- Provide recommendations for further work

1.6 Approach and methods

The project was split into three main phases:

1. Define a prototype framework to use as a tool for risk assessment of the tiger poaching threat both within PAs and within and across TRSs
2. Test the framework
   - test the hypothesis that such a model can be defined
   - identify practicalities of implementation
   - identify areas for improvement
3. Review options for analysis of the populated framework.

Different methods were applied within each of these phases.

A scorecard approach was used for defining the framework, outlining factors that are likely to have the greatest impact and evaluating these factors in a standardised way. The categories and factors to be included were identified through literature research and personal communication. Once the framework had been drafted, it was reviewed by a number of relevant experts from conservation organisations and academic institutions. Gaining positive feedback in this way was a critical milestone to pursuing the concept. The definition phase is described in *Chapter 2. Definition of the risk assessment framework.*

During the testing phase, a pilot Tiger Range State was selected, then three appropriate PAs. Interviews were conducted with local experts in the test country to discuss the concept and review the framework. Data collection to populate the framework was achieved using standardised questionnaires for pre-defined target groups of stakeholders e.g. rangers, local communities. Basic Excel data analysis functions were used to compare and contrast results at different levels, e.g. by category, by Protected Area. This testing phase is described in detail in *Chapter 3. Testing the framework.*

The framework scorecard itself had no weighting built in, i.e. all categories of factors were valued equally. The options for further analysis of the data were outlined, including sensitivity analysis that can be used to demonstrate the effects of varying the weighting of certain inputs. This is covered in more detail in *Chapter 4. Further data analysis*.

Overall conclusions and recommendations with regard to experiences of running the model and future implications and applications for this concept are described in *Chapter 5. Summary and Conclusions* and *Chapter 6. Recommendations for further work.*

CHAPTER 2. DEFINITION OF THE RISK ASSESSMENT FRAMEWORK

2.1 Introduction

The primary aim was to obtain a holistic view of all factors that contribute to the threat of tiger poaching in order to aid coordination and effectiveness of tiger conservation management. It was envisaged that stakeholders would then review this to maximise return on investment, for example when investors and researchers consider the cost benefit balance of a new project.

Having studied Environmental Impact Assessments and seen the type of framework used for documenting and assessing impacts, it was decided that a similar approach could be used to design a scorecard where the factors became risk indicators. Keeping in mind the original vision of a holistic view, and recognising the complexity of issues surrounding poaching of tigers, the tool would need to be operated at an overview level of information and enable a rapid risk assessment, otherwise there would be a danger of losing clarity of purpose by sinking in detail.

It was also decided that such an assessment should be used to indicate risk at a number of levels, e.g. at a PA level, at a country level, then rolled up to give a worldwide picture, and this began to give shape to the structure of the scorecard.

The definition of a prototype framework would have the following components:

- Identification of contributing factors at different levels of influence
- Description of these in a way that would enable standard measurement
- Design of a set of measures that would provide indicators of specific risk of tiger poaching.

The main factors would be identified through literature research, and the resulting framework would be reviewed by relevant experts in tiger

conservation both for their feedback on the detail and to gauge general acceptability of such an approach and model.

The definition phase of development and review is described below, together with the conclusions that arose from this stage of the project.

2.2 Framework development and review

The overall vision was to comparably assess PAs in TRSs to consolidate understanding of the risk of the tiger poaching threat worldwide. At the core of the methodology was the need for a risk assessment framework, around which to build an evaluation process. The steps for the methodology development and review were identified as follows:

a. Definition of the framework
b. Definition of an evaluation process
c. Development of a pack of materials for expert review of the concept
d. Review by relevant conservation experts
e. Development of the data collection process and mechanisms.

The activities and outcomes of these steps are described in turn.

a. Definition of the framework

It was the first time that a risk assessment framework of this type had been considered for the problem of tiger poaching, so there were no scientific papers or books directly focussing on the topic. However it was recognised at the start that many poaching threats and causes are common across species, though the end use may be very different, and therefore literature research should not be restricted to tigers nor to their host countries. A large number of issues as well as examples of solutions were identified across many species in many countries; however the intention here was not to highlight any one example or scientific conclusion but to look for common themes. Following extensive reading, certain recurring themes did begin to emerge and from these, factors

were listed and considered in relation to their ability to act as a predictor of risk. The factors logically fell into seven categories:

1. Policy and Legislation
2. Funding and Governance
3. Protected Area Management
4. Tiger Management
5. Local Community
6. Market for Tiger Parts
7. Tourism.

There are too many factors to discuss in detail in this report, but some findings during research have been outlined in **Box 1** below as an example - for this, the topic of local communities has been chosen as it touches on so many issues. This research pertains to Africa and proved useful in this process of identifying key factors.

Box 1: Researching factors for the framework: looking at common themes

Throughout the following references and many other scientific papers, books, news articles etc. a recurring theme was the importance and interrelationship between local communities' incentives and deterrents to poach. Given the recognition that most poaching is done by local hunters, examination of these two aspects played a significant part in selecting factors for the framework.

The importance of local communities was noted particularly in terms of their economic situation, general attitude to their neighbouring PAs and the wildlife therein, and their view of law enforcement. Many, probably most, poachers are local people, with 'outsiders' being involved as the traders or middlemen who provide the incentive to poach through large financial rewards (even though the final retail price is considerably higher, the money paid to a local hunter is significantly more than the income from their normal occupation).

A study of incentives in the poaching of black rhinos and elephants in Zambia (Milner-Gulland and Leader-Williams, 1992) concluded that the probability of capture significantly affected a hunter's decision to poach, together with the deterrent of a sliding scale of punishment based on the hunter's output. It was also concluded that, whilst organised gangs are only deterred through improved law enforcement, local people could be deterred through local investment schemes. A very good example of the latter is the Communal Area Management Programme for Indigenous Resources (CAMPFIRE) in Zimbabwe (Martin, 1986) that has demonstrated the potential financial benefits to local communities of their involvement and participation in their local wildlife conservation, with examples including income from tourism and an increase in employment opportunities. Another example is also a Zimbabwean project, involving the Mahenye people (Murphree, 2000) whose relationship with local wildlife was turned around from subsistence and commercial hunting to becoming 'proprietors' of the Gonarezhou National Park, receiving wildlife revenues from the park. Munthali and Mkanda (2002) come to the same conclusion about the importance of incentives with regard to local communities bordering PAs: from their particular research into translocating animals to avoid poachers, they concluded that it is more important to address poaching pressure in situ and ensure that "sufficient incentives to support wildlife conservation" are provided.

Factors relevant to the conclusions above are all included in the framework: evaluating risk in the areas of law enforcement, deterrents to poaching, local awareness and involvement, attitude to tigers, relationships with PA staff and those of conservation programmes, and tourism with its potential as a revenue generator.

As the intention was to use the framework as a scorecard to evaluate risk, it was important that the factors be reviewed for duplication as that would distort the result. Factors that were dependent on others were derived as a function of their component parts, and the nesting made clear (see *Section 4.2*). Whilst a large number of factors were collected that contribute in some way to the threat of tiger poaching, this was planned as a rapid risk assessment so only those deemed to have a direct link to the level of poaching were kept in the list.

A description of each factor was provided together with its reason for inclusion – the "What and Why". Measures were then identified that would provide a standardised evaluation of risk potential - this supplied the "How". Literature research continued throughout this stage to check the framework for completeness. The framework was ordered hierarchically, where appropriate, to show the level at which categories were being logically applied, e.g. *Policy and Legislation* are considered at a country level, whereas *Protected Area Management* is clearly a local issue.

An overview of the framework is shown in **Fig. 2** overleaf.

In order to build a comparable risk profile, it was important to evaluate factors in a standardised way. Also, in order for the assessment to be rapid, it required a relatively simple way to analyse any input received through data collection. It was therefore decided to use a numerical scale of ***1-5*** as the style of assessment, ***1*** indicating low and ***5*** indicating high risk, with appropriate explanation of the end points of each range. Factors were linked to measures by determining their relationship with the level of risk, e.g. having poor law enforcement is directly likely to present a higher risk as there is no deterrent through threat of punishment.

At every stage of development, checks for redundancy, repetition and dependency were revisited.

The resulting detailed framework prototype is included in **Appendix A**.

Figure 2. Overview of factors believed to have a direct impact on tiger poaching, with associated measures

Category	What aspect	Why included	Indicators	Indicator Description	How measured
1. POLICY AND LEGISLATION	Policy and legislation provide the context for tiger conservation and poaching activities. (N.B. policy seeks to deliver more than legislation, policy commitments can be met through other mechanisms e.g. funding programmes or functions in Category 2).	Provision of policy focus, tight legislation and good enforcement will certainly contribute to reducing poaching threat.	***a. Relevant laws and International Treaties***	Assessment of presence and coverage of relevant laws to support international treaties e.g. CITES, CBD. Having identified which laws and international agreements have jurisdiction in this PA, how adequate is the protection?	Scale of **1 - 5** **1** - adequate protection **5** - insufficient protection
			b. Law Enforcement	Assessment of implementation and effectiveness: from recent history, how well is legislation enforced? Derived as a function of resources e.g. staff and funding, success rate of prosecutions following intelligence and suitability of penalties.	Scale of **1 - 5** **1** - effective enforcement **5** - little or no enforcement
2. FUNDING AND GOVERNANCE	Is there clear understanding of who provides funding for the PA and is there clear accountability and responsibility for managing investment?	Tight management and monitoring is likely to expose risk.	***a. Accountability and Reporting***	Is there a clear line of governance above the PA? Derived as a function of roles & responsibilities and reporting requirements.	Scale of **1 - 5** **1** - defined and documented **5** - not defined
			b. Funding	Analysis of source and reliability of funding for the PA, its staff and programmes. Derived as a function of funding availability, breakdown, reliability and opportunity for direct benefit of successful operation through reinvestment.	Scale of **1 - 5** **1** - well managed **5** - little/no information available
3. PA MANAGEMENT	Is the PA being managed to best effect?	A well run PA with motivated staff will provide a more protected environment for tigers, and tight management will expose risks and opportunities.	***a. PA Staff***	Assessment of PA staff, derived as a function of roles & responsibilities, number and balance of staff and their motivation.	Scale of **1 - 5** **1** - good workforce **5** - urgent attention required
			b. Communication	Assessment derived as a function of PA management reporting, visitor information and links to relevant organisations, e.g. academic institutions or NGOs.	Scale of **1 - 5** **1** - good communication in place **5** - nothing established
4. TIGER MANAGEMENT	Is there a strategy or programme(s) in place to conserve the tiger in this PA?	Active management is likely to reduce risk.	***a. Estimation of numbers***	Reliability of estimation of tiger numbers will be derived as a function of methods and frequency.	Scale of **1 - 5** **1** - good level of confidence **5** - no estimating in place
			b. Suitability of habitat/ranges	Does the habitat have good potential carrying capacity and has this been translated into active management? Assessment derived as a function of habitat management, tiger and prey abundance.	Scale of **1 - 5** **1** - translated to action **5** - nothing planned
			c. Anti poaching measures	What anti-poaching measures are in place e.g. trained units on patrol; derived as a function of knowledge, dedicated anti poaching staff and frequency of patrol.	Scale of **1 - 5** **1** - good **5** - insufficient
			d. Education programmes	What efforts are made for education on tiger conservation? Are opportunities taken to raise awareness of tiger benefits and current plight? Can/are efforts measured? Derived as a function of efforts for visitors inside & those outside the PA, such as local people, schools etc., and success indicators.	Scale of **1 - 5** **1** - good effort **5** - little or no effort

Figure 2. Overview of factors believed to have a direct impact on tiger poaching, with associated measures

…continued

Category	What aspect	Why included	Indicators	Indicator Description	How measured
5. LOCAL COMMUNITY	Are there people living in and around the PA? Their presence, situation and resulting relationships will be a vital factor.	Their interaction with and attitude to tigers will dictate a powerful position from greatest ally to biggest poaching threat.	***a. Human/tiger interaction***	How much do local communities routinely come into contact with tigers? Derived as a function of proximity, density, reliance on National PA materials, relative economic hardship.	Scale of **1 - 5** **1** - little or no interaction **5** - frequent interaction
			b. Attitude to tigers	What is the general attitude to tigers locally? Derived as a function of perceived tiger threat, compensation arrangements, tiger $ value and assessment of deterrents e.g. religious beliefs.	Scale of **1 - 5** **1** - positive attitude **5** - negative attitude
			c. Involvement in tiger management	Extent to which local communities participate in tiger management programmes, with PA staff or other conservation groups? Derived as a function of opportunity for involvement through discussion and sharing of local expertise, and nature of relationships.	Scale of **1 - 5** **1** - regular participation **5** - little or no participation
6. MARKET FOR TIGER PARTS	Does a trade in tiger parts or other protected species exist in the locality?	Existence is likely to increase temptation to poach.	***a. Existence and access to market***	Assessment of a market for either opportunistic or planned poaching, derived as a function of method, motive, market e.g. ease of access to poison, guns, vehicles, a negative attitude to tigers (identified above) & knowledge of how to dispose of tiger parts.	Scale of **1 - 5** **1** - no market **5** - active market
7. TOURISM	What are the effects of a tourism presence on poaching threat (N.B. habitat disturbance is out of scope)	It is believed that tourism can reduce the poaching threat by demonstrating benefit to retaining tigers and providing additional 'monitoring' resources.	***a. Revenue generator excluding money to PA***	Revenue potential from tiger tourism - is any revenue from tourism generated by/provided to/invested in local communities?	Scale of **1 - 5** **1** - good revenue **5** - no revenue stream established
			b. Promotion of tiger as attraction	Assessment derived from whether tigers are used as a specific attraction in advertising the PA and whether locals are aware of tiger presence linking to providing attraction.	Scale of **1 - 5** **1** - positive link **5** - no link
			c. Alternative 'monitoring' body	Does a tourism presence in this PA translate to more people (hotel/tour company trackers/tourists) patrolling PAs, observing tigers and disturbing poachers?	Scale of **1 - 5** **1** - significant contribution **5** - little or no contribution

b. Definition of the evaluation process

Having developed the framework to act as a scorecard for risk evaluation, it was necessary to formulate the process for scorecard population at each Protected Area.

It was crucial to the accuracy of the ultimate assessment that a full and representative sample of stakeholders be identified and surveyed. Ignoring the factors that would be derived, there were 57 criteria for which data would need to be collected from stakeholder input. The stakeholders could be split into primary and secondary "data owners", where primary were those considered to be the main source of a particular piece of information versus those whose opinion can be used as a crosscheck (secondary). For example, asking PA staff if they consider their equipment to be adequate to do their jobs - they are clearly in the best position to judge, however NGOs or central government officials may have a view on this too from their perspectives. The PA staff are actually doing the job, but NGOs have a wider perspective on the possibilities, so a mismatch in these values would be worth investigating further. Likewise, this crosscheck can help reveal if the truth is being massaged or withheld, e.g. poaching information that local communities may be prepared to reveal can be crosschecked with rangers knowledge.

The generic process for populating the scorecard to evaluate overall risk was defined as follows (**Fig. 3**):

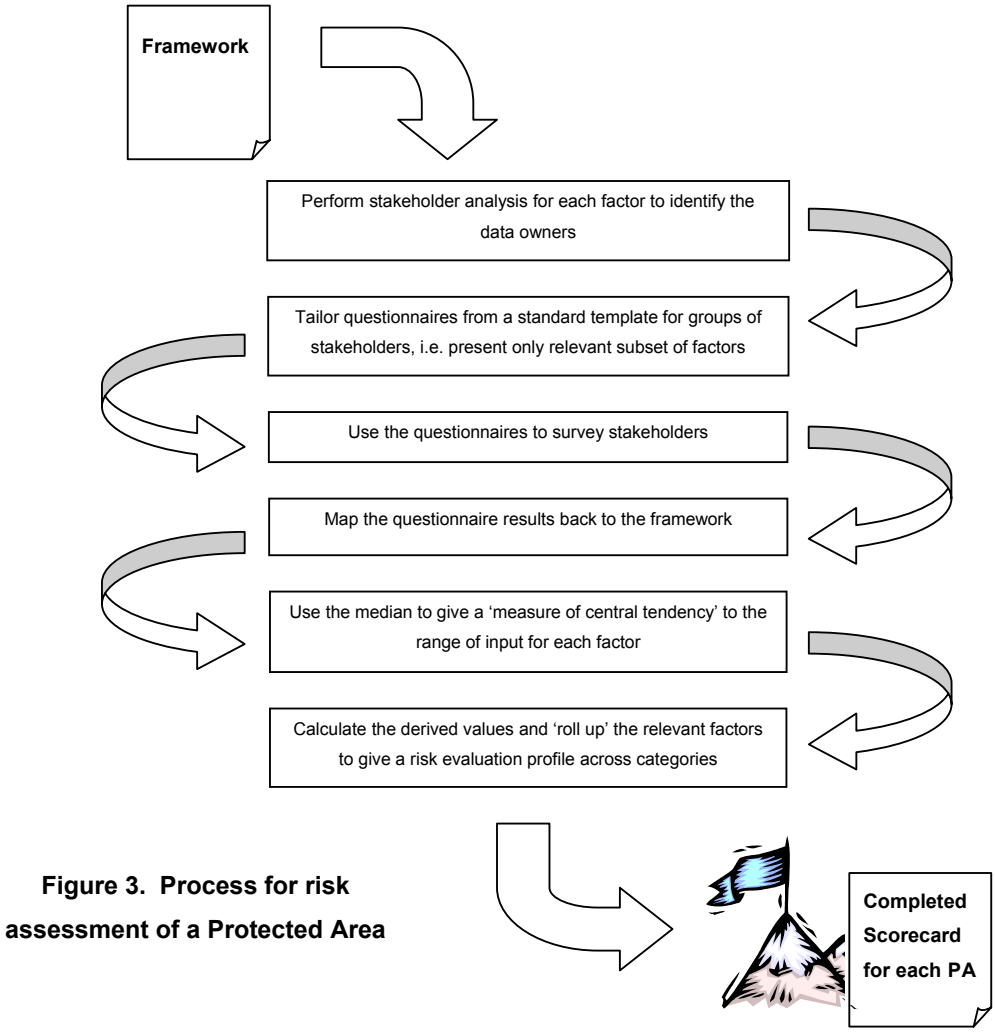


Figure 3. Process for risk assessment of a Protected Area

c. Development of a "communication pack" for review

It was understood that the real measure of success for defining such a methodology was acceptance by the tiger conservation community. Many have detailed knowledge of the tiger poaching issues as well as experience of the realities and practicalities of trying to extract information on this subject. The vision of the benefits that this management tool could bring needed to be articulated even though the methodology was in its infancy. A set of documents was created to introduce the concept and summarise the process by which the risk assessment could be undertaken.

The communication pack comprised the following:

- *Project Brief:* to summarise the project aims and objectives
- *Context Map* (**Fig. 1**, described above in *Section 1.2*): very important to recognise and acknowledge existing research or programmes
- *Introduction to the framework:* a brief introduction anticipating as many 'obvious' questions as possible, e.g. reasons for chosen scope, together with an *Overview of the Framework* (**Fig. 2**) giving "What, Why and How" of factors included together with an *Index of all factors* for quick review
- *Detailed Framework* (**Appendix A**)

d. Expert review of the concept

Throughout the literature research, a list of 'experts' was collated, including their general area of expertise (species/subspecies, topic, country of research, etc.) and the organisations to which they belonged or were affiliated. After a period of time, a subset of names kept appearing and these became the list of experts whose opinion would be valued with regard to the concept and approach. Through face-to-face meetings, some taking advantage of brief trips to the UK, feedback was successfully obtained from a good number of these relevant experts, including representatives from the following organisations:

- **Zoological Society of London** (ZSL) - joint coordinator of 21st Century Project Tiger, coordinator of captive tiger stud book, database manager of Global Tiger Projects Database (GTPD)
- **Environmental Investigation Agency** (EIA) - senior tiger campaigners
- **Wildlife Conservation Society** (WCS) - leading tiger scientists from India, Thailand, Laos, Myanmar, Cambodia, Russia
- **Smithsonian Institute** – scientific researchers with experience in Myanmar
- **TRAFFIC International** – coordinator of research and policy
- **WildAid** – investigators in tiger trade

The following NGOs, who all have active tiger programmes running, were also made aware of the project:

- Born Free Foundation (BFF)
- Worldwide Fund for Nature - UK (WWF-UK)
- David Shepherd Wildlife Foundation (DSWF)

Overall there was a positive response to continuing with the feasibility study; the nature of specific feedback is discussed in the next section (*Section 2.3*).

e. Development of the data collection process and mechanisms

With the concept 'surviving' expert review, it was time to start implementing the process defined above (**Fig. 3**) and develop the necessary mechanisms for the data collection stage. Firstly, this consisted of tailoring questionnaires for each target group of stakeholders so that they would only be asked about the subset of factors relevant to them. It was recognised that not every factor would seem relevant to each situation in every TRS, but it was important that the framework be generic and consistently applied in order for the results to be comparable. Secondly, a set of data entry screens was prepared, to receive the input acquired during the pilot studies.

The methodology was then ready for testing in a Tiger Range State.

2.3 Results and discussion

The key outputs from the development and review stage were:

- a *prototype methodology* with a detailed *framework* and associated *questionnaires* for data collection
- *feedback* from relevant experts

Some example questionnaires have been included in **Appendix B**: the first example was for NGOs and therefore long, as they potentially have information about all seven categories, the second was for rangers and the third was for

poachers, the first three sides of which was the same as for local communities. A completed questionnaire is included in **Appendix C** to give an impression of how the data collection panned out (discussed later, in *Chapter 3. Testing the framework*).

Other important outputs were the *Context Map* (**Fig. 1**) and *Overview of the Framework* (**Fig. 2**).

There were a number of challenges during the definition of the methodology:

1. To define a framework that was broad enough to take into account all the factors pertaining to tiger poaching without going into detail on each one.
2. To devise a process around the framework that was rapid enough to be applied without taking an eternity to get results and simple enough to be "packaged up" and given to others to use in new locations.
3. To define a framework that was generic enough to cover the different situations across all TRSs, be that poaching scenarios or difference in governance structures etc. This would mean, perhaps, that some countries would not have answers to everything, but standardisation would be important for comparison and contrast, for example to help reveal gaps or potential best practice, e.g. tiger tourism is big business particularly in India, but does not really feature for Thailand.
4. Building on the last point, whilst remaining generic, it was important that the framework was able to reflect true risk, which may be quite subtly buried across a number of factors. For example, poaching arising from human-tiger conflict may be easier to spot as it has no reason to be 'underground', whereas illegal traders from the black market picking off tigers in spite of anti-poaching efforts may be harder to spot.
5. To ensure that the measures were truly related to evaluating risk, for example estimating tiger numbers can just be seen as a conservation task to establish population status, however it also helps to expose poaching since it is much harder to detect missing animals if there is no knowledge of the tiger population.

6. To be controlled about the number of questions to pose to each target group of stakeholders. There was a real desire to ask everyone everything, as presented with the opportunity to do so, it would be a great shame to miss it. However, it had to be recognised that the audience must concentrate on core information, i.e. that for which they were the primary data owners; once these questions were taken care of, others could be asked to flesh out extra factors for which they may provide an interesting and/or different perspective. Feedback from the pilot studies would ultimately indicate what was a 'reasonable' length of questionnaire for each target group.

It was felt that the process and framework that resulted from the definition phase addressed these challenges satisfactorily at this stage, clearly looking to the testing phase to reveal any weaknesses or gaps.

A general point to note about the style of data collection was that a conscious decision was taken to try and record opinion and not look for facts through the framework. The reason was that it was felt to be less intrusive, for example asking if PA staff were happy with their salary seemed less threatening than asking exactly how much they earned, and besides, if a figure were given, what could be made of it? How would the interviewer be in a position to judge if that amount was reasonable or comparable? Therefore capturing people's opinions seemed sensible.

Feedback from review of the model revealed some interesting observations, discussed below.

To receive feedback from the relevant experts, the concept was briefly described and then the framework reviewed (usually having been supplied in advance by email on request, to allow time for digestion). One common theme was that people felt that the framework covered so many areas that the project would be huge and data collection difficult. This point was well made and prompted much contemplation over how to achieve the aim of a rapid and

easily workable methodology. However, with a sense that as long as a close eye was kept on balance, the methodology was robust enough for this to be overcome, the work continued undaunted. Despite this feedback, people seemed interested and a few were actually pleased and positive, buying in to the vision immediately which was both inspiring and exciting for a glimpse of future adoption.

A couple of sources gave feedback that such a generic risk framework might be difficult to implement as unique situations meant that problems differed on a case-by-case basis and the specifics would be hard to convey and generalise in this scorecard approach. Later, the same people mentioned that they were looking at success indicators for some of their TCU habitat work – ironically, the scorecards they had drafted for these were, if anything, even more high level and open to misinterpretation than the framework from this project. However the encouraging fact was that they also believed a scorecard approach could be used, albeit differently applied. It was felt to be shortsighted on their part not to realise the connection between these projects i.e. that initial baseline risk factors turn into success indicators when the same exercise is repeated over time, so if it works for one project then it will work for both. The results of this project can be used to demonstrate that.

An interesting observation during the expert review was that most people had their 'angle' and were very keen for the model to be more focussed on that, saying "but the real problem is actually…". This was all useful feedback and was absorbed and considered. A few good tips and comments were very helpful but in the main it was important to remember that this was by definition a broad-brush tool intended to represent all factors directly affecting tiger poaching, and not to prejudge by emphasising any one scenario - that would come later through weighting options (see *Chapter 4*). Given that almost every expert also had a unique perspective on what this 'real problem' was, it was to be viewed with caution - their opinions should be reflected *through* the framework, not skew it beforehand.

Ending on a positive note, almost everyone who heard about the work asked to be kept informed of the outcome.

2.4 Summary and conclusions of the definition phase

The measures of success for the definition and review phase were:

- that a prototype methodology could be devised to draw together a risk 'profile' for a Protected Area
- that a framework could be defined to evaluate such a risk profile using a scorecard approach
- that expert opinion supported the approach or at least remained open to the idea.

These conditions were successfully met, with the output of a prototype scorecard ready to be evaluated for a series of test locations. Definition of the framework involved extensive literature research to identify common themes and this, combined with review by a range of respected experts in tiger (and other species) conservation, meant the model was judged to be adequately complete for progression to the testing phase. It was clearly possible to explode the factors into many more levels of detail, but this was primarily a test run of the concept so the principle was being tested in the first instance, not the detail.

A number of important considerations were paramount in selecting the factors (or criteria) that would be evaluated to assess risk: these covered direct relevance to the poaching threat, practicalities of measurement and capturing scenarios across many cultures. The resulting framework was felt to be reasonably robust as a prototype.

As mentioned above, feedback was sought from a number of respected experts in the conservation field. Their main comment was that the framework seemed to encompass a huge and complex area in which it would be easy to get lost in

detail and potentially hard to collect information. This was useful and taken on board when defining the process for data collection.

It was necessary to be wary of people trying to skew the model in favour of their experience or opinion, as each felt strongly about their particular 'angle'.

With improvements from the review stage incorporated, the methodology was deemed ready for testing in a Tiger Range State.

CHAPTER 3. TESTING THE FRAMEWORK

3.1 Introduction

As this was a feasibility study, the objectives of the testing phase were:

- to test the hypothesis that such a model can be defined
- to gain experience of the issues and practicalities of implementing the risk assessment model
- to gain some preliminary results for two or more locations that could be compared and contrasted.

Having defined the methodology and received initial feedback regarding the resulting framework, the next step was to test the process and model in one of the 14 Tiger Range States. In order for the indicators in the scorecard to be successfully measured, it was important that the pilot study be conducted in a country with some formal infrastructure in place for managing Protected Areas. There were also seasonal limitations to consider, as well as political instability in northern India, and time constraints for obtaining necessary host government permissions, and this resulted in a pragmatic decision that Thailand would be the pilot location.

On arrival in Thailand, the Protected Areas with tigers present were reviewed with the Thai Royal Forest Department (RFD), Wildlife Conservation Society (WCS) and WildAid, a locally based NGO, and three sites were selected for the following reasons based on tiger presence and human-tiger interaction, each displaying its own distinct perspective.

1. Khao Yai National Park – historically this National Park (NP) had an established tiger population but a recently completed three year wildlife monitoring programme conducted by WCS, using camera trapping and line transect counts across the Park, identified only two individual tigers. This exercise was part of a larger multi faceted programme, the Khao Yai Conservation Programme (KYCP) based in the park, which included capacity

building for park rangers with respect to wildlife conservation and protection, and establishment of an Outreach Programme with local communities. This National Park was therefore chosen despite the lack of tigers to gauge how the model may capture and reflect this progressive approach to park management.

2. Kaeng Krachan National Park – there is believed to be a healthy tiger population in this National Park, though to date it has been scarcely studied. There have been few major conservation programmes and little coordinated local community involvement here to date, though WCS have recently proposed a 'Needs Assessment' to establish the baseline status of skills, data availability and requirements for the future.

3. Huai Kha Khaeng Wildlife Sanctuary – this Wildlife Sanctuary (WS) is one of 17 interconnected conservation areas (11 NPs and 6 WSs) that contiguously form the Western Forest Complex (WEFCOM), split only for administrative ease. WEFCOM is Southeast Asia's largest forest and has been identified as a priority landscape for biodiversity conservation. It is also generally noted as the best chance for wild tiger survival in Thailand, with Huai Kha Khaeng and Thung Yai Naresuan jointly forming a Level I (top priority) Tiger Conservation Unit (Wikramanayake *et al*., 1999). Huai Kha Khaeng Wildlife Sanctuary itself is a UNESCO World Heritage Site and currently has a good tiger population. There has been tiger research here in the past and an Outreach Programme (described in *Section 3.2.1.3* below) is currently operating that includes participation and education for the local communities.

The locations of the test sites are shown in brown in **Appendix D** – *Test sites for tiger fieldwork in Thailand.*

The nature of the fieldwork was to review the concept and discuss the framework with relevant local experts, then to collect data to populate a scorecard for each of the three Protected Areas. By doing this, experience would be gained with respect to the issues and practicalities of the

methodology, as well as providing preliminary results for the selected pilot sites.

This chapter describes the findings and results of the scorecard exercise, together with the specific findings regarding use of the tool. These outcomes are then discussed, and implications and applications for the framework considered. Lastly, conclusions are drawn from the testing phase and recommendations made.

3.2 Findings and results

As mentioned above, there were two distinct outputs to the testing. The findings with respect to the concept and methodology have been collated and discussed separately, following those findings pertaining to the pilot sites. However the former are presented with reference to examples that arose during fieldwork in Thailand.

3.2.1 Findings with regard to the test Protected Areas

Firstly the findings and results from each Protected Area are described. Within each PA, the information has been ordered as follows: context, findings, results and three key learnings for the methodology.

3.2.1.1 Results from Khao Yai National Park

a. Context

Khao Yai National Park is situated approximately 200 kms northeast of Bangkok and was established in 1962 as the kingdom's first National Park. It covers ~2170 sq kms and is spread across four provinces: Nakhon Ratchasima, Saraburi, Nakhon Nayok and Prachinburi (Gray *et al.*, 1994). The hilly terrain is "mostly covered by dense, primary, evergreen forest, with small areas of grassland, the result of cultivation by villagers and bandits, long since evicted from the park" (Elliott and Cubitt, 2001).

The park is popular with tourists, receiving close to 1,000,000 per annum most of whom are Thai. There is a perception amongst them that tigers are still in healthy numbers here and some visitors, particularly foreigners, come hoping to see one. Khao Yai is viewed as a flagship park within the National Park system, and it does not appear to be acceptable to acknowledge that tiger numbers have declined to a level where the population is no longer viable.

The present Superintendent has only been in this position for 2 months, so did not feel equipped to answer some of the questions posed. For the duration of the visit for this pilot study, a large meeting at the Khao Yai HQ dominated the proceedings, with the park management hosting 300 Superintendents and senior officials from parks across Thailand. This was distracting for management and staff alike, who found it difficult to make time for this research even though the timetable for PA visits had been requested and agreed through the RFD in Bangkok. This resulted in sparse data collection for this park, so was treated mainly as an opportunity to gain experience regarding the practicalities of the methodology.

Villagers who used to live inside the park were relocated outside the boundaries some years ago. They are relatively poor and, whilst many are farmers, others continue to enter the park to hunt or to search for aloe wood, the oil of which is used as scent in perfumes and other products. There are a large number of such poachers, with people being arrested on an almost daily basis. The aloe wood poachers enter with nothing but a knife and bag, then live in the forest for up to two weeks collecting wood and eating whatever animals they manage to catch. They also hunt wildlife along the way for commercial sale in addition to the wood. Their presence is a major threat to the habitat and tiger prey base within Khao Yai National Park. Often if they are caught and fined, the traders offer to pay the fine, and in return the poacher must go back to the forest and continue working illegally. If they refuse, and cannot pay the fine themselves, they are sent to jail. If they agree, and are caught a number of times, they are also sent to jail. To try and break this vicious cycle, the KYCP mentioned above has been providing an Outreach

Programme, to try and identify alternative methods of making a living. This is described in more detail below.

Overall, Khao Yai has few tigers but good facilities and a relatively broad conservation programme in progress through the KYCP. The park was therefore included as a test location for reviewing and assessing this model for comparison with other PAs.

b. Findings

The major conservation activity around Khao Yai has been the KYCP. This programme was jointly run and funded by the RFD, WCS and WildAid, and has included working with local communities displaced from the park, undertaking wildlife monitoring and a programme for rangers that provided uniforms, equipment and a multi faceted training course. The ranger training included weapons training and investigation/confrontation techniques from the army and Border Patrol Police (BPP) for use in tackling the high level of poaching operating on a daily basis in this park, together with wildlife identification and monitoring techniques from WCS to build capacity for local staff to continue the work as part of their ongoing duties. Yet even here, with a significant investment, poaching of aloe wood and wildlife is still rife, and ranger knowledge still appeared to be low and certainly patchy (better with elephants, little for tigers). To date, the programme has been funded externally but is now at a point of transitioning future funding and management responsibilities to the park itself; from meetings witnessed, there is low confidence that this capacity building exercise will maintain momentum and capitalise on the initial investment.

Due to KYCP staff and vehicle availability, it was not possible at the last minute to make the planned visit to the local communities. Observing and evaluating this angle of the programme was one of the primary reasons for visiting this park, so this was disappointing. The result is that this section of the Khao Yai

scorecard has only been populated by NGO and park staff opinion so should be reviewed with that in mind.

Estimation of tiger numbers was done as part of the above KYCP. The resulting map of tiger observations in Khao Yai National Park, produced by the WCS Thailand Program office, is shown in **Appendix E**. Through the training, rangers were equipped with the skills to continue this, but there was no evidence to this effect. Perhaps despite not wanting to accept the depletion of tigers in Khao Yai, management quietly deem it 'a lost cause' but this is only speculation.

There is little tiger poaching in Khao Yai now as there are hardly any tigers left. The last rumoured incident was when a tiger that used to be seen around the HQ disappeared about 18 months ago. Weapons used for capturing and killing wildlife are snares and manmade guns. Snares built with thicker wire have to be set for larger mammals e.g. tigers, so this is not accidental killing. Some local poachers were recruited to help with the wildlife monitoring study that took place as part of the KYCP, which provided temporary work. Anecdotally, tiger numbers had been hard to estimate as it was often found that poachers (and rangers) mistook pugmarks and spoor from other animals as that of tiger. One sign that could reinforce the likelihood that tigers have all but gone is that many wild dogs have recently appeared – this is an indicator of the loss of the top predator.

There is quite a good Visitors Centre at the park, and it is well placed in that it is the only way through to the gift shop. There is a lot of general information about the park, its landscape and its wildlife, though about half is only in Thai. From the tiger perspective, there is little information. There are two stuffed tigers (and a stuffed cub) with a short plaque each describing their fate, and one short information board outlining three occasions when a tiger may be dangerous e.g. a tigress

protecting her cubs. A skin mounted on the wall completes the tiger display. There is nothing with regard to tiger numbers, range, distribution, threat of extinction etc. Of those tourists who stopped at the HQ, a reasonable number entered the Visitors Centre (mainly to buy postcards, t-shirts etc). Foreign visitors spent more time reading the information. However many visitors were taken straight by their tour groups to other parts of the park, e.g. the camping facilities and waterfalls far from the HQ. There is no wildlife information provided at these locations, so many tourists only know what the tour guide presents. During the Superintendents' meeting some temporary display stands appeared at the Visitors Centre with posters outlining the KYCP detailed above, including a tiger picture taken with a camera trap. It was not known how long this display would remain.

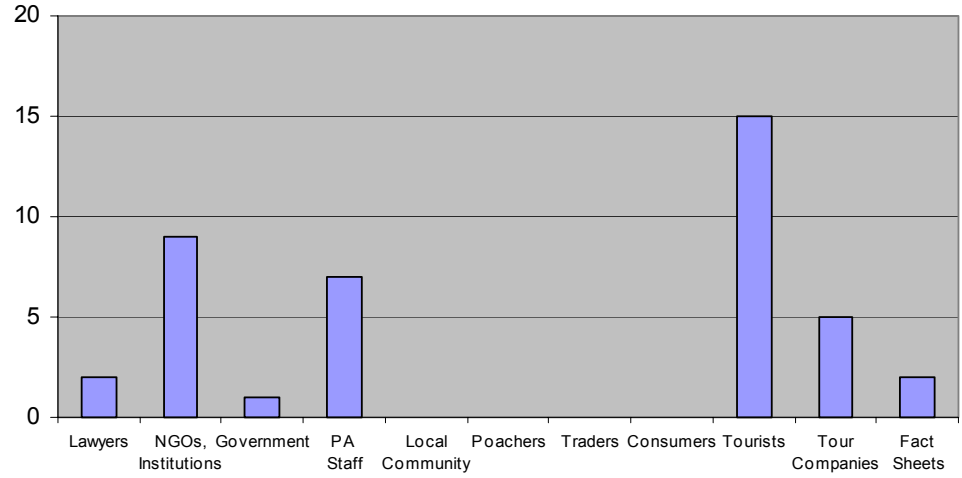
In general, the facilities at the HQ gave a good impression, but it was found on closer inspection that the trails were poorly marked, limited information was available in English and rangers also spoke little English, making communication difficult when walking with rangers acting as guides. Tourists were expected to come in groups, in which case private tour companies received the bulk of the tourist profit rather than the National Park. Independent tourists found it hard to organise their stay logistically (both hiking and accommodation) and throughout the stay, a number were witnessed to give up and leave the park with a negative impression.

Tiger sightings here used to be relatively common, but it was noted that nobody reported seeing a tiger in Khao Yai in the last couple of years.

c. Results

There were 39 Questionnaires and 2 Fact Sheets completed for Khao Yai National Park. A summary of the distribution across target groups of stakeholders is shown in **Fig. 4** overleaf.

Figure 4. Number of respondents across stakeholder target groups at Khao Yai National Park



The breakdown of respondents in these target groups is shown in **Table 2** below. The only significance of the colours (**green**, black) is to show which questionnaires were specifically answered with regard to Khao Yai, as opposed to those answered from an overall perspective for Thailand.

Table 2. Khao Yai NP Questionnaire breakdown by target group

	Lawyers	NGOs, Institutions	Government	PA Staff	Local Community	Poachers	Traders	Consumers	Tourists	Tour Companies	Fact Sheet	
Central	2	4	1								2	
PA Level		5										
Observer												
Superintendent				1								
PA Office Staff				1								
Rangers				5								
General										5		
Karen												
Foreign									14			
Local									1			
	2	**9**	**1**	**7**	**0**	**0**	**0**	**0**	**15**	**5**	**2**	***Total 41***

The completed scorecard resulting from this pilot site is shown in **Fig. 5**.

Figure 5. Khao Yai National Park Results: Risk Assessment

	RISK SCORES		Lawyers		NGOs									Gov	PA Staff							Tourists															Tour Co's				
	Averages	Medians / Averages	Lawyers		NGOs									Government	Superintendent	PA Office staff	Rangers					Tourists															Tour Companies				
1. POLICY AND LEGISLATION	**3.33**	**3.67**																																							
a. Relevant laws/International Treaties	*3.33*	*4.00*	3		4	4	4	4						1																											
b. Law Enforcement	*3.33*	*3.33*																																							
Resources	3.06	3.00																																							
No of dedicated staff	3.00	3.00	4		3	5	1	4	3	3	3	2	4	2	3		2	4	3	1	4																				
Funding	3.13	3.00	5		2	5	4	4	2	3	3	2	2	2			1	4	5	3	3																				
Seizures and prosecution	3.58	4.00	4		4	4	5	4	5	3	4	3	3	1	3																										
Penalties	3.33	3.00	2		3	4	5	4	3	3	3	3	3	3	4																										
2. FUNDING AND GOVERNANCE	**2.77**	**2.69**																																							
a. Accountability and Reporting	*2.35*	*2.50*																																							
Roles and responsibilities	2.70	3.00			1	4	3	3	3	1	3	3	3		3																										
Reporting requirements	2.00	2.00			3	3	2	2	1	1	2	2	2		2																										
b. Funding	*3.18*	*2.88*																																							
Funding availability	2.80	2.50			3	5	2	3	1	2	5	2	2		3																										
Funding breakdown	3.70	4.00			4	4	1	4	5	3	4	4	3		5																										
Reliability	3.22	3.00			2	2	5		2	4	4	4	3		3																										
Re-investment of Protected Area revenue	3.00	2.00			2	5	5-4								2																										
3. PA MANAGEMENT	**2.50**	**2.54**																																							
a. PA Staff	*3.04*	*3.25*																																							
Roles and responsibilities	2.80	3.00			1	4	3								3	2	3	4	3	3	2																				
Number of staff	2.74	2.75																																							
No. of staff across functions	2.88	3.00			2	3	1	3	4	2	4	3	3		1	2	4	3	4	4	3																				
Staff make-up	3.19	3.50																																							
Local recruitment	2.81	3.00			3	2	3	3	3	1	3	3	3		1	1	2	5	3	4	5																				
Staff rotation	3.56	4.00			2	4	4	2	2	3	3	3	4		4	3	4	4	5	5	5																				
Terrain type	3.20	3.00			3	4	2	3							3		5	1	5	3	3																				
Popularity	1.69	1.50			3	1	3	2	2	1	2	2	1		1	1	1	2	3	1	1																				
Staff motivation	3.57	4.00																																							
Pay	4.45	5.00			5	5	4	4							4	3	5	5	5	4	5																				
Training	2.88	3.00			4	5	1	4	4	1	3	2	3		3	4	3	3	3	1	2																				
Equipment	3.47	4.00			4	4		4	4	2	4	2	2		4	3	2	5	5	4	3																				
Individual attitude	2.69	3.00			3	4	4	3	1	1	5	2	3		3	3	5	2	1	1	2																				
Incentive schemes	4.36	5.00			4	5	5	5							5	3	3	5	5	4	4																				
b. Communication	*1.96*	*1.83*																																							
Management Reporting	1.00	1.00																																							
Own progress	1.00	1.00													1																										
Comparative	1.00	1.00													1																										
Visitors centres	2.58	2.00			2	1	3	2	4	5	4	2	2		1	2	2	2	3	2	2	3	3	2	4	3	3	3	2	3	3	4	2	2	3	3	2	1	2	2	4
Links to other organisations	2.30	2.50									4	3	3		1	2	1	1	3	2	3																				
4. TIGER MANAGEMENT	**2.96**	**2.85**																																							
a. Estimation of numbers	*3.50*	*3.50*																																							
Methods used	3.13	3.00			5	2	1	4	1	2	3	2	2		2		4	5	5	4	5																				
Frequency	3.86	4.00			5	4	1	4	3	2	4	3	4				5	5	5	4	5																				
b. Suitability of habitat/ranges	*2.66*	*2.50*																																							
Habitat management	2.23	2.00			3	4	1		1	3	2	2	3				5	1	1	2	1																				
Abundance of tigers	3.29	3.50			3	5	4	5	5	5	2	2	5				3	1	1	4	1																				
Abundance of prey	2.46	2.00			2	2	4	3	4	3	2		4				3	1	1	2	1																				
c. Anti poaching measures	*2.57*	*2.28*																																							
Understanding of poaching threats	3.05	2.75																																							
Target poaching locations	2.25	1.50			4	3	1		4	4	1		2				1	1	1	4	1																				
Tiger trade potential	3.86	4.00			3	4	4	2	3	4	4	3	3			3	5	5	5	4	5	3	2	5	3	4	5	5	5	5	5	4	5	5	1	1	5	2	5	5	3
Anti poaching staff	3.15	3.38																																							
Frequency of patrolling	2.00	2.00			4	2	1	2	2	1	2	2	1				1	2	3	2	3																				
PA Boundary markings	2.07	1.00			4	2	2	3	1	1	1	4	1			4	1	1	1	1	4																				
d. Education programmes	*3.12*	*3.13*																																							
Visitor awareness	3.09	3.00			3	3	3	2	3	2	3	5	3			3	3	3	3	4	4	4		3	4	4	2	2	2	4	4	3	2	3	4	4	3	2	3	1	4
Local awareness	2.81	3.00			4	1	1	2	4	1	2	4	2			3	2	1	5	1	1	3															4	4	5	5	4
Group trips	2.65	2.50			3	2	1	2	2	1	3	4	4			2	2	5	5	4	1	3																3	3	2	1
Success indicators	3.93	4.00			3	5	4	3	4	1	3	4	3									3	5		3	3	5	5	5	5	5	1	5	5	5	5	5	4	3	4	4
5. LOCAL COMMUNITY	**3.01**	**2.97**																																							
a. Human/tiger interaction	*3.33*	*3.17*																																							
Human proximity/density	2.40	2.00				2	1	2	1	3	3	2	1			5																									
Reliance on materials from the PA	3.78	4.00			4	5	5	3	4	3	4	3	3																												
Relative economic hardship	3.80	3.50			3	5	4	4	5	3	5	3	3			3																									
b. Attitude to tigers	*3.71*	*3.75*																																							
Threat to livestock/humans	1.89	2.00			2	2	1	1	1	1	3	3	3																												
Compensation schemes	4.50	5.00			5		5	5		5			5			2																									
Potential $ value	4.00	4.00			5	5	3	5		3	4		3																												
Deterrents to poaching	4.46	4.00			4	2	4	4	4	3			4																												
c. Involvement in tiger management	*1.99*	*2.00*																																							
Opportunity for discussion	2.25	2.00			1	3	1	1	3	2	5		2																												
Use of local expertise	1.63	2.00			1	2	1	1	2	2			2			2																									
Relationship with conservation/PA staff	2.10	2.00			1	3	2	2	4	1	2	2	2			2																									
6. MARKET FOR TIGER PARTS	**3.38**	**3.36**																																							
a. Existence and access to market	*3.38*	*3.36*																																							
Method	2.92	2.83																																							
Available weaponry	4.00	4.50			5	5	5	5	4	3		3	2																												
Tiger availability	1.92	1.00			5	2	5	2	1	1		1	1				1	1	1		2																				
Market access: routes/traders	2.86	3.00			2	4	5	3	4	1			1																												
Motive	3.71	3.75																																							
Market	3.50	3.50				4	3																																		
7. TOURISM	**3.23**	**3.17**																																							
a. Revenue generator excluding PA	*3.36*	*3.00*			3	5	5	4	5	3	4		3									3															3	3	2	2	2
b. Promotion of tiger as attraction	*3.58*	*3.50*																																							
By Tour Companies	3.22	3.00			2	2	3	2	5	5	5		3									3	5		3	4	1	1	2	4	3	5	4	4	1	2	3	3	4	5	3
Local awareness of tiger link with tourism	3.94	4.00			2	5	5	4	5	4	4		3					5	5	5	5	3															4	4	4	3	1
c. Alternative 'monitoring' body	*2.76*	*3.00*			4	2	3	2	2	1	4		3				3	5	5	1	5	3	5	2	3	3	1	1	2	5	5	2	2	3	1	1	2	1	3	3	3

Using the Medians/Averages initially (see *Section 4.1* for more detail), points of note in the results on this scorecard were as follows.

It must be remembered that this was the first test run and a full survey of this PA was not achieved. Having said that, there were a few features that could be picked out as characterising the park and some results could therefore be predicted from the impressions formed on the experience of the visit. These act as a sort of 'control' group indicating if the overall results appear generally correct. The results of the control group are:

Popularity: The park receives more visitors annually than any other, so one would expect the risk to be on the lower end – it is ***1.5***. ✓

Visitors Centre: The Visitors Centre at Khao Yai is relatively good, though much of the information is only in Thai so not good for foreigners – this has scored a risk result of ***2***; there is some tiger information presented here, albeit sketchy and of little educational value and this has been reflected in a higher risk result of ***3***. ✓

Success indicators: Whether foreigner or local, on visiting the park, there is little feedback requested (other than an optional visitors book) such as what made you want to visit the park, so there is currently no opportunity for management to monitor success of any PR or educational promotion that could take place. This has a relatively high risk result of ***4***. ✓

These results do therefore back up the impressions formed during experience of the visit, giving a level of confidence for the overall risk profile.

Some points of interest noted from the model results were:

*MARKET FOR TIGER PARTS (**3.36**):* Looking at the results across category 6 - *Available weaponry* has a higher risk of ***4.5***, as poachers are already in the park for aloe wood and expecting to kill wildlife for subsistence and commercial sale on the side, with access to market for these through transport and contacts (*Market*

access = ***3***). There are few tigers left in the park so *Tiger availability* is low (***1***) but given that there are weapons available if necessary, it should be noted that on the rare occasion of a bonus find of a tiger (bonus rather than target: *Motive* = ***3.75***), there is a *Market* (risk = ***3.5***) that would process it, so the market is not dead despite the rarity of tigers. This does not bode well for those planning this habitat for a tiger comeback.

*Local awareness of tiger link with tourism (**4**)*: There is little local awareness of any link between tiger presence and visitors coming (***4***) and this is reflected in the fact that tigers have now all but disappeared in the park through poaching and prey depletion. Given that visitors still come, it may be they are right not to recognise that link, but it should be noted that many visitors still think there are plenty of tigers, so when the true tiger status is understood, it may cause a change in attitude.

d. Three key learnings for the methodology

- Timing had a big impact on the success of this first test run. Despite having contacted the park management before arrival, it was not mentioned that the visit would clash with the meeting at the Khao Yai HQ hosting 300 Superintendents and senior park officials from across Thailand. Consequently the park management and most staff were busy and distracted, and it was difficult to secure time for surveying. *Timing is crucial and availability must be checked carefully. Allowing more time also means less chance of wasting a whole visit.*

- Despite being told that many spoke English at Khao Yai, this was not found to be the case and staff from KYCP began to help with translation. This was greatly appreciated, but obviously they also had a 'day job', so progress was slow. *It was clear that a dedicated translator had to be recruited for the next test site.*

- As this was the first pilot location, it took a little time to understand the most effective approach to getting questionnaires completed. Even though the

large week–long meeting was a problem, it was soon realised that the clearer the research requirements, the easier it is for the audience to respond. A firm, clear, polite statement up front to the Superintendent of what time was needed from whom, confirming support from central RFD, would be more effective than asking for 'help' with surveys piecemeal. This also gives the management time to consider the plan, and in this case, it may have sensibly curtailed the visit to return another time. *Gently forceful as well as resourceful was the style to adopt at future locations.*

3.2.1.2 Results from Kaeng Krachan National Park

a. Context

Kaeng Krachan National Park is situated approximately 220 kms southwest of Bangkok and was established in 1981. At 2915 sq kms, it is Thailand's largest National Park. It is spread across two provinces, Phetchaburi and Prachuap Khiri Khan, with the western boundary following the border with Myanmar (Elliott and Cubitt, 2001). The terrain is densely forested with steep cliffs, caves and hills rising westwards into mountains. Vegetation includes tropical and submontane broadleaved evergreen forests, mixed deciduous forests and lowland scrub (Gray *et al*., 1994).

The park attracts relatively few tourists (around 200,000 pa), considering its size and proximity to Bangkok, and most of those who do visit are Thai citizens. A large number of these Thai tourists come to camp at the HQ situated approximately 20 km outside the park proper, and leave without entering the forest at all.

The Superintendent believes that the three principles of a National Park are protection, research and education (including tourism), and he supports research as the basis for the other two, be it outreach programmes, wildlife monitoring etc. He has plans for better tourist facilities at the park, but these are based around

the HQ rather than facilitating tourists venturing into the core of the forest. There has been very limited scientific research undertaken here to date.

For administrative purposes, the park is split into three areas, and roles and responsibilities are clearly defined for each manager for their particular area. In addition to the HQ, there are 19 substations spread throughout the park. The staff structure from a ranger perspective consists of 20 permanent and 200 temporary staff, deployed as one permanent Head and 7-14 temporary rangers per substation. Although categorised as 'temporary staff', many of them have been employed for many years, e.g. over 10 years was not uncommon. For temporary staff, wages are low and there are no additional benefits such as medical insurance or sick pay. This appears to be a way of maintaining a large workforce for whom the RFD acknowledges little responsibility.

Kaeng Krachan National Park has support through visits and funding from the Thai Royal Family, with Queen Sirikit championing a particular project underway with the Karen families to live more sustainably by reducing negative impact on their forest surroundings.

The only villagers living inside the park boundaries are the Karen people; they have certain land rights as they were living there before the park was established. There are approximately 70 Karen families, and they use wood and other forest products as well as hunt. There are no current plans to relocate them outside the park, though they were all moved into one big village about 7 years ago. Other local communities around the park are mainly employed as farmers, or fishermen in the vast reservoir next to the HQ. Local people with businesses such as resorts, restaurants, boating companies etc. benefit from tourism to the park, but many more people are very poor and get no benefit from the park's existence.

The key threat for Kaeng Krachan is probably lack of knowledge and data about the park. The forested mountainous terrain is hard to monitor, and there is little true awareness of the level of potential illegal activities such as hunting.

b. Findings

Traditionally the Karen people have been the wildlife hunters and poachers, both for local consumption and for sale, but it was not possible to visit the village due to its remoteness (approximately 70 kms from the HQ inside the core of the park). However one man who was interviewed came from the village and returns every 1-2 months. He reported that if a tiger were killed it would be big news in the village, not kept quiet. As he had not heard anything recently, it could be assumed that no tigers have been poached. One reason given for less poaching is that hunters are employed by the National Park as rangers.

Generally, there were a number of stories about tiger poaching in the past (useful for understanding methods, motives and the market historically), but little information regarding current trade. It was difficult to ascertain if this was because there is no active trade in tigers, or just that people were not aware of it. Certainly local people outside the park repeatedly responded with the view that there were no hunters or traders now as there were no tigers left to kill! Previously trading was done with "rich people" in business in the town or city; hunters would tell the traders when they saw a tiger, and if the trader was interested, they would pay the hunter to kill. Some traders were noted as Chinese, and in one case a Thai man with his own wildlife shop. Nowadays, according to the villagers, there is little or no local tiger trade, though still trade in other species. An interesting example of this was an incident with a Great Hornbill, where hunters killed a mother and took the chick. Local people bought the chick from the hunters for 300 baht (~£4.70), and brought it back to the rangers for release. The chick was far too small to be independent, so was hand reared at the substation; named "300" and now an adult living freely, he likes human company so stays close by. This story gives an interesting insight to the continuance of hunting, and at least some local people's positive attitude and reaction.

"300" assisting my research

Other feedback regarding current poaching suggested that around Kaeng Krachan, government officials, police and Border Patrol Police (BPP) sometimes abuse their positions knowing their seniority will protect them from arrest and prosecution. They hunt for sport and occasionally to sell. They may use their own staff or pay locals. Access to weapons is not normally easy for villagers, and when poaching occurs, the weapon of choice is a gun. Another comment was that experienced hunters are becoming rare - skills are not automatically being passed on to the younger generation, and this will impact the level of poaching over time at least for this community.

All reports of tigers being killed were in the forest; although local people used to see tigers occasionally outside the park, there were no stories of tiger damage or attack, and consequently no knowledge of any compensation arrangements if they exist. There used to be tiger sightings outside the park up until about 10 years ago, since then nearly everyone said they had not seen a tiger. Any tiger killing in this area was proactive and intentional, not the result of a tiger coming out of the forest and the villagers needing to protect themselves or their livestock.

Rangers were friendly and helpful, but their knowledge of tigers was very limited. Most forest surveillance appeared to be through guided walks rather than through any formalised pattern of patrolling. They occasionally saw pugmarks, but were not aware of individual tiger ranges and did not even have a good feel for the number of tigers in the National Park. Estimates varied wildly from 5-10 to 40-50. On a positive note, the Superintendent stated that the 'flagship' species for the park were tigers and Siamese crocodiles (a new population having been recently discovered here), though there seemed to be an expectation that learning more about these species had to come from external researchers rather than a local park initiative e.g. to study their own tiger population. WCS are already researching the effects of road disturbance in the centre of the park, and have installed camera traps (though 8 have 'disappeared' near the river with the Siam crocodiles). WCS approached the Superintendent with a further proposal for a 'Needs Assessment' starting in October 2002, to identify future research and training opportunities. There is now a mutual desire to study the Kaeng Krachan

tiger population, and this will provide the first in depth tiger information for this park. Having looked to external researchers, there was concern that the research should benefit the park not just provide acclaim for the organisation. This point was raised on and off throughout the fieldwork in Thailand, by both RFD staff and local people.

Regarding park administration, the Superintendent was starting to see some other PA reports – as Kaeng Krachan is just south of the Western Forest Complex, it is seen as loosely connected. This may prompt further formalisation of scientific study and prioritisation and given the recognised importance of WEFCOM, could provide real benefit to tigers here too. There was no 'tiger community' currently in place whereby staff in Kaeng Krachan could discuss the conservation needs or problems with other PAs that have wild tigers remaining.

In general, surveying for this project prompted interest in tigers from both rangers and visitors, with curiosity about tiger numbers, location, breeding patterns and rarity, as well as threats facing them etc. There was great potential for further discussion and education, but the current education tool (a Visitors Centre) is not hitting the mark.

Surveying around the campfire, students on a conservation trip were keen to hear more about tigers

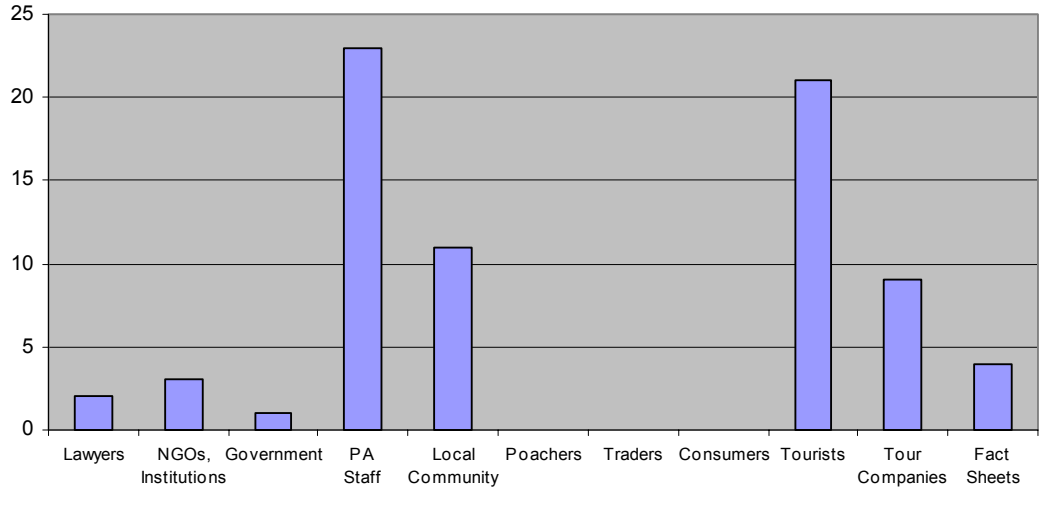
The Visitors Centre is at the HQ, in the next room to where the park entry tickets are sold, however it is not promoted and most visitors either did not seem to notice it or chose not to go in. Those few who did go in spent very little time inside. There is no information about tigers, not even a picture. The only carnivore information is a short description of Lon Grassman's research study in which leopards, leopard cats and civets were radio collared and tracked within the park. The Superintendent would like information about Kaeng Krachan's flagship species (Siamese crocodiles and tigers) to be presented in the Visitors Centre, and has requested this as an output of WCS' research work in the park. The busiest entry point is the Pala-U substation, where many tourists pay and enter

the park hence bypassing the HQ. There is no Visitors Centre here, though the substation does have some posters regarding butterfly and bird identification, and one plaster cast of a tiger pugmark from the park on display. Unfortunately, visitors pay at the booth outside and continue, so again this education opportunity is largely wasted.

c. Results

There were 70 Questionnaires and 4 Fact Sheets completed for Kaeng Krachan National Park. A summary of the distribution across target groups of stakeholders is as follows (**Fig. 6**):

Figure 6. Number of respondents across stakeholder target groups at Kaeng Krachan National Park



The breakdown of respondents in these target groups is shown in **Table 3** overleaf. The only significance of the colours (blue, black) is to show which questionnaires were specifically answered with regard to Kaeng Krachan, as opposed to those answered from an overall perspective for Thailand.

Table 3. Kaeng Krachan NP Questionnaire breakdown by target group

	Lawyers	NGOs, Institutions	Government	PA Staff	Local Community	Poachers	Traders	Consumers	Tourists	Tour Companies	Fact Sheet		
Central	2	2	1								1		
PA Level		1											
Observer													
Superintendent				1									
PA Office Staff				11									
Rangers				10							2		
General					10					9			
Karen				1	1						1		
Foreign									9				
Local									12				
	2	3	1	23	11	0	0	0	21	9	4	*Total*	*74*

The completed scorecard resulting from this PA is shown overleaf in **Fig. 7**.

Again, using the Medians/Averages initially, points of note in the results on this individual scorecard were as follows.

As with Khao Yai, there were a few features that could be picked out as characterising the PA and the results could therefore be predicted from the impressions formed on the experience of visiting the park. Again, these act as the 'control' group indicating if the overall results appear generally correct. The results of this control group are:

Terrain Type: This park is the largest NP in Thailand with densely forested hills, so presents a large area to cover and difficulty in seeing for any distance when patrolling - the risk result is high at ***5***. ✓

Visitors Centre: There is a Visitors Centre but it is quite small and the information is patchy, e.g. good for hornbills but poor for large mammals - this has scored an average risk at ***3***; however there is no tiger information at all – *Visitor awareness* of tigers has scored a high risk result of ***5***. ✓

Figure 7. Kaeng Krachan National Park Results: Risk Assessment

	RISK SCORES		Lawyers		NGOs			Gov	PA Staff																						
	Averages	Medians / Averages	Lawyers		NGOs			Government	Superintendent	PA Office staff									Rangers												Karen
1. POLICY AND LEGISLATION	**2.76**	**2.75**																													
a. Relevant laws/International Treaties	***3.00***	***3.50***	3		4	4		1																							
b. Law Enforcement	***2.51***	***2.00***																													
Resources	3.18	3.00																													
No of dedicated staff	4.29	5.00	4		5	1	5	2	4										5	4	5	5	5	3	5	5	5	5	5		5
Funding	2.06	1.00	5		5	4	3	2											1	1	1	1	2	1	1	3	1	1	1		
Seizures and prosecution	1.71	1.00	4		4	5	3	1	1																						
Penalties	2.65	2.00	2		4	5	3	3	5																						
2. FUNDING AND GOVERNANCE	**2.50**	**2.38**																													
a. Accountability and Reporting	***2.13***	***2.00***																													
Roles and responsibilities	2.25	2.00			4	3	1		1																						
Reporting requirements	2.00	2.00			3	2	1																								
b. Funding	***2.88***	***2.75***																													
Funding availability	3.25	3.50			5	2	1		5																						
Funding breakdown	2.75	2.50			4	1	5		1																						
Reliability	2.50	2.00			2	5	2		1																						
Re-investment of PA revenue	3.00	3.00			5	5-4			1																						
3. PA MANAGEMENT	**3.03**	**3.01**																													
a. PA Staff	***3.01***	***3.01***																													
Roles and responsibilities	2.40	2.00			4	3			1	2	2	1	4	2	4	4	2	2	4	4	1	1	4	1	5	1	1	4	1	1	1
Number of staff	3.17	3.44																													
No. of staff across functions	3.65	4.00			3	1	4		4	4	3	5	4	4	5	4	5	4	3	5	3	4	1	3	4	4	5	5	5	1	2
Staff make-up	2.79	2.75																													
Local recruitment	1.73	1.50			2	3	3		1	2	1	1	3	2	1	1	3	2	1	3	2	1	1	1	1	2	3	2	1	1	1
Staff rotation	3.85	4.00			4	4	2		3	5	5	5	4	3	3	5	4	4	4	5	2	5	1	5	5	3	5	5	1	3	5
Terrain type	3.92	5.00			4	4															2	5	5	5	5	5	1	5	1	4	5
Popularity	2.31	2.00			3	3	2		3	2	2	3	4	2	2	2	2	2	2	1	1	1	1	3	3	2	3	3	3	3	2
Staff motivation	3.45	3.60																													
Pay	4.48	5.00			5	4			5	4	5	5	4	3	3	5	3	5	5	5	5	5	5	3	5	5	4	5	5	4	5
Training	3.23	3.00			5	2	4		1	3	5	4	5	4	3	4	3	4	4	4	3	3	3	2	2	4	3	2	1	2	4
Equipment	3.84	4.00			4		4		4	2	4	4	5	4	5	4	4	3	4	5	5	5	5	2	2	3	1	3	5	5	4
Individual attitude	1.62	1.00			4	4	1		1	3	2	1	4	2	3	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Incentive schemes	4.08	5.00			5	5			4	3	5	5	2	5	5	5	3	3	5	5	5	5	2	3	3	4	4	3	3	5	5
b. Communication	***3.05***	***3.00***																													
Management Reporting	3.00	3.00																													
Own progress	1.00	1.00							1																						
Comparative	5.00	5.00							5																						
Visitors centres	3.46	3.00			3	3	4			2	2	3	4	3	5	3	4	4	5		5	5	5	3	3	3	3	3	4	3	
Links to other organisations	2.68	3.00							1	4	1	3	4	2	3	2	2	2	1	5	3		3	3	4	3	3	3	2	3	2
4. TIGER MANAGEMENT	**2.97**	**2.95**																													
a. Estimation of numbers	***3.17***	***3.00***																													
Methods used	2.40	2.00			4	1	1		4										5	4	5	1	1	3	1	1	1	2	2		
Frequency	3.93	4.00			4	2	4		5										5	5	5	4	3	4	3	3	4	4	4		
b. Suitability of habitat/ranges	***2.62***	***2.67***																													
Habitat management	3.13	4.00			4	1	1		4										5	4	5	2	2	4	1	1	5	3	5		
Abundance of tigers	3.07	3.00			4	4			2										5	4	4	3	3	1	3	3	1	3	3		
Abundance of prey	1.67	1.00			2	4	2		2										1	1	1	3	1	1	2	2	1	1	1		
c. Anti poaching measures	***2.64***	***2.63***																													
Understanding of poaching threats	3.45	4.00																													
Target poaching locations	3.00	3.00			3	1	4												5	5	5	1	2	3	2	1	1	4	5		
Tiger trade potential	3.91	5.00			4	4	4			5	5	5	5	5	5	3	5	5	5	5	5	5	5	5	5	5	5	5	1	5	5
Anti poaching staff	3.31	3.52																													
Frequency of patrolling	1.62	1.00				3	4												1	1	1	2	2	2	1	1	1	1	1		
PA Boundary markings	2.19	2.00			3	2	4			3	2	3	5	2	3	4	2	2	1	1	4	5	5	1	2	1	1	1	3	2	1
d. Education programmes	***3.43***	***3.50***																													
Visitor awareness	4.44	5.00			5	3	5			5	5	5	5	5	5	5	4	4	5	5	5	5	4		4		4	5	5	5		
Local awareness	3.16	3.00			3	2	4		5	5	4	4	5	5	4	5	2	2	5	5	1	1	1	2		2		5	1	1	3
Group trips	2.40	2.00			3	2	2		3	3	3	2	5	4	1	3	3	3	2	1	1	1	1	1		1		5	2	1	3
Success indicators	3.71	4.00			5	4	4		4																						
5. LOCAL COMMUNITY	**3.05**	**3.12**																													
a. Human/tiger interaction	***2.39***	***2.33***																													
Human proximity/density	1.47	1.00			2	5	3			1	2	1	1	1	5	1	1	1	3	1	1	1	1	2	1	2	1	1	1	1	2
Reliance on materials from the PA	2.00	2.00			4	5	3																								
Relative economic hardship	3.69	4.00			4	3	3		4	3	3	4	3	3	5	4	4	3	3	2											
b. Attitude to tigers	***3.74***	***3.69***																													
Threat to livestock/humans	1.29	1.00			1	3	1																								
Compensation schemes	4.95	5.00				5			5	5	5	5	4		5	5		5	5	5											
Potential $ value	4.54	5.00			5	3																									
Deterrents to poaching	4.20	3.75			2	4	4																								
c. Involvement in tiger management	***3.01***	***3.33***																													
Opportunity for discussion	3.27	4.00			4	1	4		4																						
Use of local expertise	3.61	4.00			2	1	2		5	5	1	1	3	5	5	2	1	1	5	5	3	5	4	5	4	5	4	4	4	2	1
Relationship with conservation/PA staff	2.15	2.00			4					3	2	3	3	3	3	2	2	2	3	1	2	1	1	2	3	2	2	3	3	3	4
6. MARKET FOR TIGER PARTS	**3.47**	**3.40**																													
a. Existence and access to market	***3.47***	***3.40***																													
Method	2.09	1.50																													
Available weaponry	2.83	2.50			5	5	4												3	3	4	1	5	1	5	5	1	5	1		
Tiger availability	1.52	1.00			2	2	2												1	1	2	2	2	2	3	3	3	1	1		
Market access: routes/traders	1.92	1.00			4	5	4												5	5	5	1	1	1	1	1	1	1	2		
Motive	3.74	3.69																													
Market	4.57	5.00				4													5	5	3	5		5					5		
7. TOURISM	**3.00**	**3.17**																													
a. Revenue generator excluding PA	***2.71***	***2.50***			5	5	5		1																						
b. Promotion of tiger as attraction	***3.73***	***4.00***																													
By Tour Companies	4.48	5.00			3	3	5																								
Local awareness of tiger link with tourism	2.97	3.00			5	5	5												1	1	1	1	5	1	5	5	5	5	4		
c. Alternative 'monitoring' body	***2.57***	***3.00***			3	3	2		1										4	3	3	2	5	2	5	5	1	1	3		

continued on next page

Figure 7. *cont'd* Kaeng Krachan National Park Results: Risk Assessment

cont'd from previous page

	RISK SCORES		Local Community											Tourists																					Tour Companies								
	Averages	Medians / Averages	Local Comm.											Tourists																					Tour Companies								
1. POLICY AND LEGISLATION	**2.76**	**2.75**																																									
a. Relevant laws/International Treaties	***3.00***	***3.50***																																									
b. Law Enforcement	***2.51***	***2.00***																																									
Resources	3.18	3.00																																									
No of dedicated staff	4.29	5.00																																									
Funding	2.06	1.00																																									
Seizures and prosecution	1.71	1.00	1	1	1	1	1	1	1	1	1	1	1																														
Penalties	2.65	2.00	2	3	1	1	2	1	5	1	5	1	1																														
2. FUNDING AND GOVERNANCE	**2.50**	**2.38**																																									
a. Accountability and Reporting	***2.13***	***2.00***																																									
Roles and responsibilities	2.25	2.00																																									
Reporting requirements	2.00	2.00																																									
b. Funding	***2.88***	***2.75***																																									
Funding availability	3.25	3.50																																									
Funding breakdown	2.75	2.50																																									
Reliability	2.50	2.00																																									
Re-investment of PA revenue	3.00	3.00																																									
3. PA MANAGEMENT	**3.03**	**3.01**																																									
a. PA Staff	***3.01***	***3.01***																																									
Roles and responsibilities	2.40	2.00																																									
Number of staff	3.17	3.44																																									
No. of staff across functions	3.65	4.00																																									
Staff make-up	2.79	2.75																																									
Local recruitment	1.73	1.50																																									
Staff rotation	3.85	4.00																																									
Terrain type	3.92	5.00																																									
Popularity	2.31	2.00																																									
Staff motivation	3.45	3.60																																									
Pay	4.48	5.00																																									
Training	3.23	3.00																																									
Equipment	3.84	4.00																																									
Individual attitude	1.62	1.00																																									
Incentive schemes	4.08	5.00																																									
b. Communication	***3.05***	***3.00***																																									
Management Reporting	3.00	3.00																																									
Own progress	1.00	1.00																																									
Comparative	5.00	5.00																																									
Visitors centres	3.46	3.00												2	3	4	3	3	3	5	5	3	3	4	3	4	4	4	4	3	2	4	3	3	4	5	1	5	3	3	2	3
Links to other organisations	2.68	3.00																																									
4. TIGER MANAGEMENT	**2.97**	**2.95**																																									
a. Estimation of numbers	***3.17***	***3.00***																																									
Methods used	2.40	2.00																																									
Frequency	3.93	4.00																																									
b. Suitability of habitat/ranges	***2.62***	***2.67***																																									
Habitat management	3.13	4.00																																									
Abundance of tigers	3.07	3.00																																									
Abundance of prey	1.67	1.00																																									
c. Anti poaching measures	***2.64***	***2.63***																																									
Understanding of poaching threats	3.45	4.00																																									
Target poaching locations	3.00	3.00	5	5		1	1	1	5	5	5	1	1																														
Tiger trade potential	3.91	5.00	5	5		5	5	5	5	5	5	5	5	5	5	5	2	5	5	3	3	3	1	5	1	1	2	5	2	3	1	1	1	5	4	1	5	1	1	2	4	3	3
Anti poaching staff	3.31	3.52																																									
Frequency of patrolling	1.62	1.00																																									
PA Boundary markings	2.19	2.00	1	1	1	1	1	1	3	1	1	4	1																														
d. Education programmes	***3.43***	***3.50***																																									
Visitor awareness	4.44	5.00												5	4	5	5	5	5	5	5	5	4	4	4	4	2	5	5	5	3	5	4	4	5	4	2	5	5	3	4	4
Local awareness	3.16	3.00	5	5	2	3	3	2	1	5	1	4	1																	4				3	2		2	5	2	4	4	4
Group trips	2.40	2.00	1	1	3	3	3	3	3		5	5	2										2	1	1	4	1	1	5	5	2	4	1	1	2	1	1	3	2	1	4	2	3
Success indicators	3.71	4.00												5	5	4	5	5	5	3	5	5	5	3	4	5	5	1	5	2	4	1	2	3	3	1	3	2	4	5	3	2	4
5. LOCAL COMMUNITY	**3.05**	**3.12**																																									
a. Human/tiger interaction	***2.39***	***2.33***																																									
Human proximity/density	1.47	1.00	1	1	1	1	1	1	1	1	1	1	1																														
Reliance on materials from the PA	2.00	2.00	1	1	2	2	2	2	1	1	2	1	1																														
Relative economic hardship	3.69	4.00	5	5	4	5	5	5	2	3	5	2	4																														
b. Attitude to tigers	***3.74***	***3.69***																																									
Threat to livestock/humans	1.29	1.00	1	1	3	1	1	1	1	1	1	1	1																														
Compensation schemes	4.95	5.00	5	5		5	5	5	5	5	5	5	5																														
Potential $ value	4.54	5.00	5	5	5	5	5	5	5	5	5	3	3																														
Deterrents to poaching	4.20	3.75	3	3	4	3	4	3	3	3	4	4	3																														
c. Involvement in tiger management	***3.01***	***3.33***																																									
Opportunity for discussion	3.27	4.00	5	4	1	3	3	3	5	4	1	5	2																														
Use of local expertise	3.61	4.00	5	5	4	4	4		5	5	4	5	4																														
Relationship with conservation/PA staff	2.15	2.00	3	3	1	1	1		1	1	1	1	1																														
6. MARKET FOR TIGER PARTS	**3.47**	**3.40**																																									
a. Existence and access to market	***3.47***	***3.40***																																									
Method	2.09	1.50																																									
Available weaponry	2.83	2.50	1	1	5	2	2		5	1	1	1	1																														
Tiger availability	1.52	1.00	1	1	1	1	1	1	1	1	1	1	1																														
Market access: routes/traders	1.92	1.00	1	1	1	1	1	1	1	1	1	1	1																														
Motive	3.74	3.69																																									
Market	4.57	5.00																																									
7. TOURISM	**3.00**	**3.17**																																									
a. Revenue generator excluding PA	***2.71***	***2.50***	2	2	4	4	4		1	1	1	1	1																	2				4	1	3	2	1	3	4	3	5
b. Promotion of tiger as attraction	***3.73***	***4.00***																																									
By Tour Companies	4.48	5.00												5	5	4	1	5	5	5	4	5	5	4	5	5	5	5	5	5	5	4	5	4	4	5	5	3	5	5	5	4	5
Local awareness of tiger link with tourism	2.97	3.00	3	3	1	4	4		3	1	1	4	2																	2				2	2	1	1	1	4	5	4	4
c. Alternative 'monitoring' body	***2.57***	***3.00***	1	1	1	2	2	3	1	3	1	2	3	5	2	4	3	4	4	2	3	3	3	2	1	3	3	1	3	3	1	2	1	1	2	1	5	1	1	5	4	4	4

Tiger Availability: People believe there are no tigers left and very few of the rangers had seen even pugmarks recently - this has been reflected in the access to tigers for poaching scoring low risk of ***1***. ✓

These results do therefore back up the impressions made during the visit, giving a level of confidence for the overall risk profile.

A couple of points of interest from the final scorecard were:

*Local Recruitment (**1.5**):* There is a good track record of recruiting locally - this is reflected in the low risk score of ***1.5***.

*Staff Motivation (**3.6**)*: This has room for improvement and is made up from five elements: *Pay* is considered low, scoring a high risk at ***5,*** *Training* is an average risk at ***3,*** *Equipment* is not considered adequate, scoring ***4,*** *Incentive schemes* are virtually non existent, scoring ***5*** – yet *Individual attitude* scores well with a low risk score of at ***1.*** This situation largely reflects the split of permanent versus temporary, where the vast majority are the latter with a poor remuneration package, but encouragingly (and impressively) this does not seem to daunt people's high commitment to their job.

*Abundance of prey (**1**):* A point of note is that although the habitat is not specifically prioritised as strategically important at a formal level (giving *Habitat management* a risk of ***4)***, and that the *Abundance of tigers* should be higher given the quality of the habitat, scoring an average risk of ***3***, if priority is given to Kaeng Krachan and its tigers actively protected then there is enough *Abundance of prey* to support them, scoring a low risk ***1***. This is important considering that a primary issue in other locations is prey depletion.

d. Three key learnings for the methodology

- Based on experience from Khao Yai, the first meeting on arrival at Kaeng Krachan was with the Superintendent. There the requirements for time and

sample numbers from his staff were presented and discussed, and individuals were selected immediately by the Chief and told to report for surveying. Everyone made time to cooperate, and people were very friendly and helpful, with both completing questionnaires and logistical assistance. *Having the public support of the Superintendent made a huge difference to the time taken and to the attitude of the staff towards the project.*

- Again based on experience at Khao Yai, a translator was recruited for Kaeng Krachan. Having been instructed by the Chief to help, staff began to stream in, and it was found to be more efficient to translate to groups simultaneously whilst they completed their questionnaires in parallel. It was important to first make clear that answers should be their individual opinion and not copied. *Group surveys worked well with translation and facilitation.*

- From discussion, it became clear that the sample target groups for respondents needed to be carefully explored. As this was a test run, the sample sizes were set to 10, but there were different perspectives to consider. Key examples were: permanent versus temporary staff, HQ versus substation rangers (particularly as the HQ was outside the park in this case), and lastly Karen villagers (traditionally the hunters) still living in the National Park versus local communities living around the park edges and involved in tourism profits versus local communities with no business link to tourism. *Determining the most representative samples within the stakeholder groups is crucial to recording a true risk assessment.*

3.2.1.3 Results from Huai Kha Khaeng Wildlife Sanctuary

a. Context

Huai Kha Khaeng Wildlife Sanctuary is situated approximately five hours drive northwest of Bangkok, and forms part of a vast area known as the Western Forest Complex. It was gazetted in 1972 after a mining concession was

revoked and covers 2,780 sq kms spread across three provinces: Kanchanaburi, Uthai Thani and Tak. The terrain is hilly and forested; vegetation includes evergreen forest on the mountains, mixed deciduous forest at mid elevations and deciduous dipterocarp forest in the lowlands (Elliott and Cubitt, 2001).

Wildlife Sanctuaries are not open for tourists; researchers and visitors for educational purposes can enter, but need prior permission that is strictly administered.

The Wildlife Sanctuary staff at Huai Kha Khaeng report to the Natural Resources Division in the central RFD, whereas the Research Station staff within the sanctuary report to the Research Division – this means two 'masters', and a split of staff and level of expertise.

Villagers no longer live inside the Wildlife Sanctuary as the government relocated them outside, some still within the Buffer Zone, around 20 years ago. They were given houses and some land as compensation, but many lost land area and say the new soil is no good, causing some to feel resentful towards the authorities. They said that it is very difficult for local people to go into the PA now. There are approximately 600 households, in 30 villages, in and around the Buffer Zone. There is an Outreach programme (described in more detail below) that is working in about 10 of these villages so far. Although visitors come to Huai Kha Khaeng, they do not spend money in the local businesses, such as restaurants or shops, so there is currently minimal benefit to local communities.

Although some people still enter the WS to collect forest products, such as mushrooms and bamboo shoots, the area is reasonably well protected from the previous threats such as logging, dam building, hunting and poaching. There are still rumoured attempts at tiger poaching and the terrain is hard to monitor, but the PA Management respond with increased patrolling if the reports reach them. It is not easy to tell if any attempts were successful.

b. Findings

Again, traditionally the Karen people have been hunters and poachers, but other local people also hunt sometimes if they have the opportunity. Within the Karen community, there is a local system of punishment with three tiers whereby for example if a big animal is poached, the first level is a warning, then a fine then finally the guilty party is taken to the authorities if they persist in their activities. For other communities, normal Thai law applies, and the penalties noted were jail and also fines; even for possession of tiger parts, one respondent quoted 4 years in jail and a 50,000 baht (~£800) fine.

Feedback regarding poaching suggested that traders come from outside the area, sometimes as far as Bangkok, often acting as middlemen for someone prepared to fund an all expenses paid hunt to get their tiger, including food, high powered guns, bullets etc. Examples of the people prepared to pay for this were high-ranking government officials as well as people trading at Chinese markets. Weapons were considered easily available, and methods used were shooting (taking care not to damage the skin) and poisoning bait, for example a fresh kill. The whole body could be sold, but some commented that the specific emphasis was presently on skins, with bones and other parts being a bonus. This implies a different primary consumer than the usual target of Traditional Chinese Medicine (TCM) practitioners.

There is an excellent 'Watchdog' scheme operating around the PA, where villagers have volunteered to act as 'eyes & ears' in their local area, reporting any poaching activity to a central control base from which it is passed to the relevant authorities, be that rangers or police. These volunteers are unpaid, and have come forward in protest against outsiders coming in and decimating their wildlife. They are given walkie-talkies to communicate with each other and the central base, and this network now has contacts in 10 villages, including some members who are Community Leaders, i.e. elected heads of their village. This scheme was organised by WWF-Thailand, who have also implemented an education project entitled *Huay Mae Dee Environmental*

Education Project, Western Forest Complex (1998-2000), in collaboration with the RFD and Ministry of Education (MOE), This taught about the environment, wildlife conservation and sustainable living. Key project outputs included training of schoolteachers, MOE staff, village leaders, Buddhist monks and other groups such as Peace Corps Volunteers, as well as Outreach activities in villages, schools and temples. Youth camps were organised and a series of local radio programmes and Public Service Advertisements (PSAs) were made promoting conservation in the Western Forest Complex. This successful project has led to a follow-up entitled *Strengthening Environmental Education in Thailand* (SEET Proposal, WWF-Thailand, 2002) and this was just beginning. Local relationships with WWF-Thailand seemed good, and the local people appeared to have responded well. It was noticeable that where the Outreach programme had been working, people were more cheerful and responsive; beyond the programme, people seemed more dispirited.

Monks in wildlife training (Courtesy of WWF-Thailand)

Most people surveyed had themselves seen tigers or pugmarks in or around Huai Kha Khaeng, and rangers still saw either tigers or least pugmarks on a reasonably regular basis. Tigers were rarely seen outside the forest though, and very few people knew of cases of damage or attacks by tigers, so confrontation and compensation were not a major issue. In one incident that was mentioned, a tiger came out of the PA about three years ago into a village in the Buffer Zone. A villager used a stone and catapult then the tiger attacked, seriously injuring him. The villagers called the rangers and they came and took the tiger back to the sanctuary for release. The government paid for all hospital treatment but not lost wages.

Estimation of the tiger population is done by staff at the Research Station; others guessing at tiger numbers ranged from 50-70, however the most informed estimate put the number at ~40 (Simchoern pers. comm., 2002). The range of other guesses shows that current tiger information is not well informed. Specific tiger research stopped when a particular researcher was transferred from the sanctuary 4 years ago. No handover was arranged by management so good knowledge of Huai Kha Khaeng's tigers is sliding increasingly out of date. There is no formal or regular contact between Huai Kha Khaeng and other tiger PAs, either in Thailand or with other Tiger Range States, to share information or best practice regarding tiger conservation.

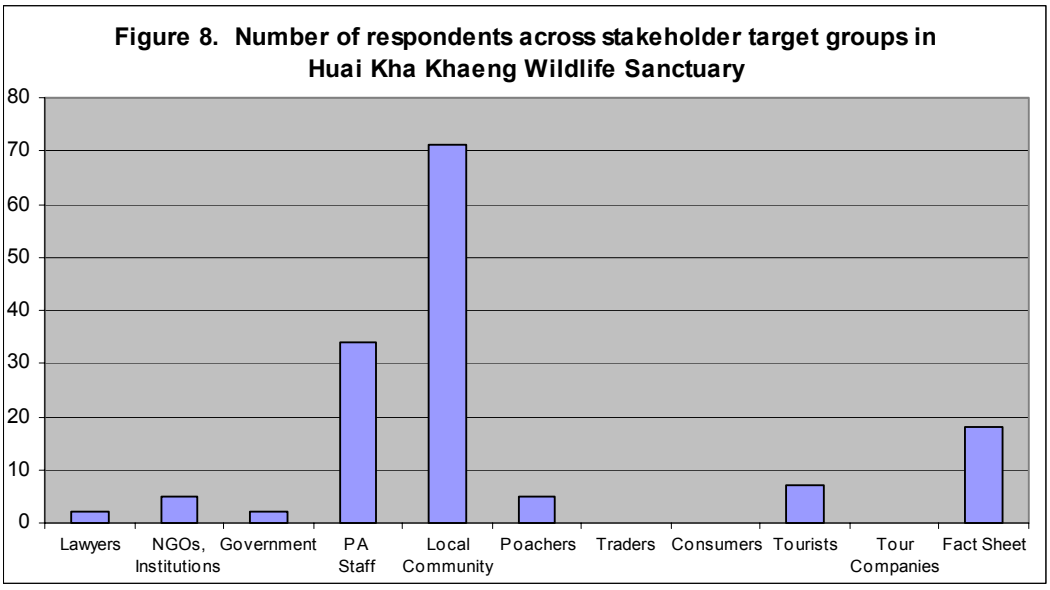
Though not tiger experts, rangers seemed more serious about their roles than in the previous test locations, and through conversation their forest and wildlife expertise appeared greater. Rangers were trained for forest work, but not Outreach-type work, though a couple had helped at a training activity as part of the Education Programme, and were paid extra for doing so. Although the staff seemed willing and committed, the Superintendent was not present and it was commented that he was often hard to track down.

The sanctuary edges are not well marked at the moment, and there is a project underway with villager participation to paint trees and rocks to make the boundaries clear. So far, four villages have taken part in this.

There is an information centre at the sanctuary but there is no mention of tigers, in fact not even a picture, though there is a photo on display at the outdoor lecture theatre.

c. Results

There were 126 Questionnaires and 18 Fact Sheets completed for Huai Kha Khaeng Wildlife Sanctuary. A summary of the distribution across target groups of stakeholders is as follows (**Fig. 8**):



The breakdown of respondents in these target groups is shown in **Table 4**.

Table 4. Huai Kha Khaeng WS Questionnaire breakdown by target group

	Lawyers	NGOs, Institutions	Government	PA Staff	Local Community	Poachers	Traders	Consumers	Tourists	Tour Companies	Fact Sheet		
Central	2	3	1								1		
PA Level		2									1		
Observer													
Superintendent				2							1		
PA Office Staff				19									
Rangers				12									
General			1	1		5					5		
Karen					12								
Watchdog					9						9		
Monks					13								
Primary Students					10								
Secondary Students					6								
Teachers					11								
Community Leaders					10						1		
Foreign									1				
Local									6				
	2	**5**	**2**	**34**	**71**	**5**	**0**	**0**	**7**	**0**	**18**	***Total***	***144***

The only significance of the colours in the table above (red, black) is to show which questionnaires were specifically answered with regard to Huai Kha

Khaeng, as opposed to those answered from an overall perspective for Thailand.

The completed scorecard resulting from this pilot site is shown in **Fig. 9** on the next page. Points of note in the Medians/Averages results on this scorecard were as follows.

As previously, there were a few features that could be picked out as characterising the PA and the results therefore predicted from the impressions formed from visiting the sanctuary. Again, these act as the 'control' group indicating if the overall results appear generally correct. The results of this control group are:

Terrain Type: Again the PA's area is huge - the risk is relatively high at ***4***. ✓

Revenue Generation: Wildlife Sanctuaries are not set up as tourist venues so there is no formal opportunity to generate extra revenue from tourism related business, e.g. tour guides. However, there are a number of research and education visitors that come so there is some opportunity for revenue for shops and restaurants – the risk result was ***4***. ✓

TOURISM: Similarly, as there is no tourism, there are no opportunities for *Tour Companies* to promote tigers as an attraction (other than education groups) – this scored ***4***. ✓

These results do therefore back up the impressions formed during the visit, giving a level of confidence for the overall risk profile.

A couple of points of interest from the final scorecard were as follows.

*Estimation of tiger numbers (**3**):* The *Frequency* and *Methods used* in estimating tiger numbers scored an average risk, ***3*** and ***3*** respectively, but these should be reviewed over time as currently no one has picked up the

Figure 9. Huai Kha Khaeng Wildlife Sanctuary Results: <u>Risk Assessment</u>

	RISK SCORES		Lawyers		NGOs					Gov		PA staff																												
	Averages	Medians / Averages	Lawyers		NGOs					Government		Superintendent		PA Office Staff																			Rangers							
1. POLICY AND LEGISLATION	**2.73**	**3.08**																																						
a. Relevant laws/International Treaties	***2.50***	***3.00***	3		3	3	4			1	1																													
b. Law Enforcement	***2.95***	***3.17***																																						
Resources	3.39	3.50																																						
No of dedicated staff	3.77	4.00	4		4	4	5	3	4	2	2	4	3																				4	4	5	5	5	4	2	4
Funding	3.00	3.00	5		4	1	5	5	4	2	2																						3	3	2	2	1	2	2	3
Seizures and prosecution	2.57	3.00	4		3	3	4	3	3	1	3	3	2																											
Penalties	2.90	3.00	2		3		4	3	4	3		1	4																											
2. FUNDING AND GOVERNANCE	**2.75**	**2.81**																																						
a. Accountability and Reporting	***2.25***	***2.25***																																						
Roles and responsibilities	2.25	2.00			3	3	4	2	1		1	2	2																											
Reporting requirements	2.25	2.50			3	1	3	2	2		3	3	1																											
b. Funding	***3.25***	***3.38***																																						
Funding availability	3.00	3.00			3	1	5	5	2		2	3	3																											
Funding breakdown	2.86	3.00				3	4	3	2		2	4	2																											
Reliability	2.63	3.00			3	3	2	3	3		2	3	2																											
Re-investment of PA revenue	4.50	4.50			4	5	5					4																												
3. PA MANAGEMENT	**2.97**	**2.86**																																						
a. PA Staff	***2.91***	***2.88***																																						
Roles and responsibilities	2.11	2.00			3	4	4				2	2	1	1	3	3	3	3	3	3	3	2	2	2	1	2	3	2	2	2	3	1	1	1	1	1	2	2	1	1
Number of staff	3.28	3.25																																						
No. of staff across functions	3.35	3.00			2	2	3	5	3		3	3	5	2	4	2	4	4	4	4	3	4	4	4	1	4	4	3	3	4	4	5	5	4	3	2	4	2	2	3
Staff make-up	3.46	4.00																																						
Local recruitment	3.58	4.00			1	2	2	2	3		2	4	3	4	4	5	4	4	4	5	3	5	4	5	3	5	2	5	5	3	3	5	3	3	5	5	5	5	1	4
Staff rotation	3.35	4.00			1	4	4	4	2		2	2	4	1	4	5	5	5	5	5	3	5	5	5	1	5	3	5	4	4	5	5	3	2	2	3	1	1	2	1
Terrain type	4.00	4.00			3	5	4				4																						4	5	1	5	4	3	5	3
Popularity	2.30	2.00			2	5	4	3	2		5	2	1	2	2	2	2	2	1	2	2	2	2	4	2	2	2	3	2	2	3	4	2	2	1	1	1	2	3	1
Staff motivation	3.34	3.40																																						
Pay	3.49	4.00			5	3	5					3	3	2	4	4	4	4	5	4	3	4	5	5	2	4	3	2	4	4	4	5	4	4	2	3	3	4	3	4
Training	3.18	3.00			3	5	5	5	2		2	3	3	2	4	3	5	4	4	4	4	3	4	4	2	5	3	4	3	4	3	4	1	1	2	2	4	3	2	2
Equipment	3.78	4.00			3	5	4	3	4		2	4	4	3	4	4	4	4	4	4	3	5	4	5	3	4	3	3	3	4	4	5	5	5	3	2	5	5	3	5
Individual attitude	1.80	1.00			4	4	4	4	1		2	2	2	1	3	2	2	2	2	2	3	1	1	3	1	1	2	1	1	2	1	1	1	1	1	1	1	1	1	1
Incentive schemes	4.45	5.00			4	4	5				4	5	3	4	5	5	5	5	5	5	5	5	5	5	4	5	5	5	5	3	5	5	3	3	5	5	5	5	5	3
b. Communication	***3.02***	***2.83***																																						
Management Reporting	3.00	2.50																																						
Own progress	2.67	2.00									5	2	1																											
Comparative	3.33	3.00									4	3	3																											
Visitors centres	3.16	3.00			3	5	3	5	4					4	3	4	4	4	3	3	4	3	4	3	4	4	2	3	3	3	4	3	3	2	1	3	2	2	2	3
Links to other organisations	2.91	3.00									3	3	2	3	3	3	4	2	2	2	3	4	3	5	3	4	2	3	3	4	3	5	3	3	3	1	4	3	3	3
4. TIGER MANAGEMENT	**2.69**	**2.59**																																						
a. Estimation of numbers	***2.90***	***3.00***																																						
Methods used	3.00	3.00			3	2	2	5	4		1	4	4																				4	4	2	2	1	2	1	4
Frequency	2.81	3.00			4	4	4	2	3		1	4	1																				3	4	3	3	3	2	2	2
b. Suitability of habitat/ranges	***1.98***	***1.67***																																						
Habitat management	1.86	2.00			3	1	3	2	1		2	3	1																				2	2	1	1	1	1	2	3
Abundance of tigers	2.52	2.00			3	4	4	5	3		3	4	1																				4	4	1	2	1	1	1	4
Abundance of prey	1.57	1.00			3	2	2	2	1		1	3	1																				1	2	1	3	1	1	1	1
c. Anti poaching measures	***2.76***	***2.46***																																						
Understanding of poaching threats	3.36	3.50																																						
Target poaching locations	2.66	3.00			2	4	4	5	2		4																						4	4	2	2	1	2	2	2
Tiger trade potential	4.06	4.00			3	3	3	4	2					5	4	5	5	4	4	4	4	4	5	5	5	4	3	5	5	4	5	5	3	2	4	4	4	4	4	4
Anti poaching staff	3.31	3.33																																						
Frequency of patrolling	1.94	1.00			3	3		3	2																								1	1	1	1	1	1	1	1
PA Boundary markings	2.43	2.00			3	3	2	4	2		2			1	3	2	2	1	2	2	2	1	1	2	1	2	2	1	1	2	3	2	1	1	1	2	3	2	1	1
d. Education programmes	***3.13***	***3.25***																																						
Visitor awareness	2.89	3.00			3	5	5	5	3					3	3	3	4	3	3	3	2	5	4	1	2	4	1	4	3	4	3	1	3	1	1	1	1	1	1	3
Local awareness	3.23	3.00			3	2	2	4	2		4	4	3	3	4	4	4	5	5	5	1	5	5	3	3	4	2	3	5	4	5	3	3		3	3	3	2	3	4
Group trips	2.80	3.00			3	3	5	4	1		4	2	1	2	3	3	3	2	3	2	1	3	3	5	2	3	2	4	2	2	3	5	4	4	1	1	1	1	1	3
Success indicators	3.60	4.00			4	3	5	4	2		5	2	1																											
5. LOCAL COMMUNITY	**2.99**	**2.94**																																						
a. Human/tiger interaction	***2.63***	***2.67***																																						
Human proximity/density	1.64	1.00			3	3	3	1	3		1			2	2	3	3	3	3	3	5	2	2	4	2	3	5	1	2	2	1	4	4	4	1	1	1	2	1	4
Reliance on materials from the PA	2.68	3.00			2	5	4	4	2																															
Relative economic hardship	3.57	4.00			4	1	4	4	3		4	4	4	3	4	3	4	3	4	4	1	4	4	4	3	4	2	3	3	3	3	4								
b. Attitude to tigers	***3.53***	***3.50***																																						
Threat to livestock/humans	2.38	2.00			2	4	2	2	2																															
Compensation schemes	4.67	5.00			5	5		5	5		5	5		4	5	5	5	5	5	5		5	5	4	3	5		3	5	5	3	4								
Potential $ value	2.48	2.00			4	3	5	3	2																															
Deterrents to poaching	4.60	5.00			2	4	2	4	2																															
c. Involvement in tiger management	***2.82***	***2.67***																																						
Opportunity for discussion	3.14	3.00			2	1	3	5	3		5	4	1																											
Use of local expertise	2.95	3.00			2	1	2	3	2		4	4	3	4	4	2	3	3	2	2	3	2	2	2	4	3	3	3	2	3	4	2	4	4	3	4	3	2	3	3
Relationship with conservation/PA staff	2.37	2.00			3	3	4	4	1		4			2	3	3	2	2	3	3	1	3	3	3	2	2	3	2	3	2	3	3	2	4	3	3	3	3	2	3
6. MARKET FOR TIGER PARTS	**3.04**	**2.83**																																						
a. Existence and access to market	***3.04***	***2.83***																																						
Method	2.35	2.00																																						
Available weaponry	2.95	3.00			4	4	5	5	3		5																						4	5	5	5	5	5	4	3
Tiger availability	1.76	1.00			2	3	2	3	1		3																						2	2	5	5	5	5	5	3
Market access: routes/traders	2.34	2.00			3	2	4	3	2																								1	1	5	5	5	4	2	1
Motive	3.53	3.50																																						
Market	3.24	3.00																															5	5	5	5	5	5	3	5
7. TOURISM	**3.42**	**3.50**																																						
a. Revenue generator excluding PA	***4.04***	***4.00***			3	5	5	4	3		5	5	2																											
b. Promotion of tiger as attraction	***3.36***	***3.50***																																						
By Tour Companies	3.54	4.00			4	5	5	4	5		5																													
Local awareness of tiger link with tourism	3.18	3.00			4	5	5	5	5																								4	1	2	1	1	1	2	2
c. Alternative 'monitoring' body	***2.87***	***3.00***			3	5	3	2	2		4	3	4																				2	2	3	5	5	4	2	2

Figure 9. *cont'd* Huai Kha Khaeng Wildlife Sanctuary Results: <u>Risk Assessment</u>

	RISK SCORES		PA staff cont'd					Local Community																																		
	Medians / Averages	cont'd from prev. page	Rangers cont'd				Researcher	Teachers											Secondary Students						Primary Students										Monks									
1. POLICY AND LEGISLATION	**3.08**																																											
a. Relevant laws/International Treaties	*3.00*																																											
b. Law Enforcement	*3.17*																																											
Resources	3.50																																											
No of dedicated staff	4.00		3	2	5	5																																						
Funding	3.00		4	4	3	3																																						
Seizures and prosecution	3.00							4	2	4	2	3	4	4	1	2	1	4	3	2	3	3	3	2	4	3	3	1	3	3	1	1	1	1	1	4	5	4	4	1	2	3	1	1
Penalties	3.00							5	3	5	2	3	3	3	3	3		5	5	3	5	5	4	3	5	5	4	2	2	5	4	4	3	2	3	5	5	4	5	1	1	4	1	4
2. FUNDING AND GOVERNANCE	**2.81**																																											
a. Accountability and Reporting	*2.25*																																											
Roles and responsibilities	2.00																																											
Reporting requirements	2.50																																											
b. Funding	*3.38*																																											
Funding availability	3.00																																											
Funding breakdown	3.00																																											
Reliability	3.00																																											
Re-investment of PA revenue	4.50																																											
3. PA MANAGEMENT	**2.86**																																											
a. PA Staff	*2.88*																																											
Roles and responsibilities	2.00		3	1	3	1																																						
Number of staff	3.25																																											
No. of staff across functions	3.00		3	3	4	3	3																																					
Staff make-up	4.00																																											
Local recruitment	4.00		2	2	3	5	3																																					
Staff rotation	4.00		1	2	5	5	3																																					
Terrain type	4.00		5	2	5	5	5																																					
Popularity	2.00		4	3	2	1	2																																					
Staff motivation	3.40																																											
Pay	4.00		2	2	3	3	1																																					
Training	3.00		4	3	3	2	1																																					
Equipment	4.00		2	3	4	5	2																																					
Individual attitude	1.00		1	1	3	1	3																																					
Incentive schemes	5.00		3	3	4	5	4																																					
b. Communication	*2.83*																																											
Management Reporting	2.50																																											
Own progress	2.00																																											
Comparative	3.00																																											
Visitors centres	3.00		3	2	3	2	3																																					
Links to other organisations	3.00		2	1	2	2	3																																					
4. TIGER MANAGEMENT	**2.59**																																											
a. Estimation of numbers	*3.00*																																											
Methods used	3.00		4	3	4	2	5																																					
Frequency	3.00		2	2	2	3	5																																					
b. Suitability of habitat/ranges	*1.67*																																											
Habitat management	2.00		2	4	1	2	1																																					
Abundance of tigers	2.00		2	2	2	1	1																																					
Abundance of prey	1.00		1	1	2	2	1																																					
c. Anti poaching measures	*2.46*																																											
Understanding of poaching threats	3.50																																											
Target poaching locations	3.00		3	3	2	2	1	5	4	4	2	2	4	4	3	4	2	3	4	1	4	4	4	4	1	2	3	3	2	3	3	2	3	3	1	3	2	1	5	1	4	1	1	3
Tiger trade potential	4.00		4	4	3	4	2	2	4	2	4	4	4	4	4	1	3	1	1	2	1	5	5	5	4	4	4	5	3	3	4	5	4	4	5	5	5	5	5	5	5	5	5	5
Anti poaching staff	3.33																																											
Frequency of patrolling	1.00		5	5	2	1	1																																					
PA Boundary markings	2.00		4	4	4	2	1	4	1	5	5	3	4	4	1	3	5	2	5	1	5	1	1	1	4	5	5	2	4	4	1	1	1	2	4	4	1	2	3	3	1	1	1	1
d. Education programmes	*3.25*																																											
Visitor awareness	3.00		3	1	4	2	5																																					
Local awareness	3.00		5	3	5	3	5	5	3	5	3	3	5	4	2	3	5	2	5	5	5	4	4	5	1	1	1	3	1	1	3	4	3	2	5	5	3	1	3	3	3	1	1	5
Group trips	3.00		3	1	3	1	2	5	1	5	4	4	3	2	3	2		3	5	5	5	1	1	1	3	3	3	3	3	3	2	1	1	3	5	4	4	3	1	3	2	1	1	3
Success indicators	4.00																																											
5. LOCAL COMMUNITY	**2.94**																																											
a. Human/tiger interaction	*2.67*																																											
Human proximity/density	1.00		1	3	4	1		1	2	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1	1	1	1
Reliance on materials from the PA	3.00							5	4	5	5	3	4	1	3	2	4		5	5	5	1	1	2	2	2	2	5	5	5	3	2	4	4	3	2	1	1	5	1	4	3	1	1
Relative economic hardship	4.00							5	4	4	5	5	4	4	4	4	5	3	4	5	4	3	3	3	3	3	4	3	3	3	3	3	3	3	2	3	4		1	5	3	3	5	2
b. Attitude to tigers	*3.50*																																											
Threat to livestock/humans	2.00							3	1	4	2	1	1	1	3	3	2	1	4	4	4	1	3	1	1	1	1	1	1	3	2	1	2	1	1	2	5		5	1	1	5	1	2
Compensation schemes	5.00							5	5	5	5	5	5	5	5	5	5	5	5	5	5	1	5	5	5	5	5	4	5	5	4	2	2	4	5	5	4	5	4	5	5	5	1	3
Potential $ value	2.00							3	1	2	1	1	3	4	1	3	1	4	3	3	3	1	1	1	4	3	4	2	5	5	1	1	1	2	5	1	5	1	5	5		5	5	1
Deterrents to poaching	5.00							4	4	4	4	4	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	4	4	4
c. Involvement in tiger management	*2.67*																																											
Opportunity for discussion	3.00							5	2	5	4	4	5	2	4	4	5	2	4	5	5	5	5	5	1	1	2	2	2	2	4	4	3	3	1	5	4	2	5	1	3	1	1	1
Use of local expertise	3.00		3	4	4	4		1	3	2	3	5	2	2	3	3	3	1	1	3	1	3	3	3	3	3	3	2	3	3	4	4	4	3	3	5	4	2	4	5	4	3		3
Relationship with conservation/PA staff	2.00		3	2	3	3		5	2	2	2	3	2	2	2	4	3	1	3	3	3	2	2	2	1	3	1	2	1	1	2	1	1	1	1	4	5		3	1	1	5	1	2
6. MARKET FOR TIGER PARTS	**2.83**																																											
a. Existence and access to market	*2.83*																																											
Method	2.00																																											
Available weaponry	3.00		5	1	4	5		3	2	5	1	3	5	4	2	4	2	4	4	3	3	3	3	3	1	5	5	1	1	1	2	1	3	2	5	3	2	1	4	5	5	5	5	2
Tiger availability	1.00		2	4	3	5		1	3	1	1	1	2	1	1	1	1	4	1	1	1	1	1	1	1	1	1	3	1	1	3	1	2	2	3	1	1		4	1	1	1	1	1
Market access: routes/traders	2.00		4	5	2	5		3	1	3	1	2	4	3	5	5	1	1	1	1	1	3	3	3	1	5	1	1		1	2	1	2	2	2	3	2	1	3	1	4	1	1	3
Motive	3.50																																											
Market	3.00		4	4	5	5		3	1		1	4	2	3	1	1	1	2		5		2	2	4	1	1		2	5	5	4	1	3	2				5	2			4	3	
7. TOURISM	**3.50**																																											
a. Revenue generator excluding PA	*4.00*							5	3	5	4	5	3	3	5	4	5	4	5	5	5	5	3	2	3	3	3	4	2	3	4	4	4	4	5	5	4	4	4	3	2	1	5	3
b. Promotion of tiger as attraction	*3.50*																																											
By Tour Companies	4.00																																											
Local awareness of tiger link with tourism	3.00		4	5	2	1		2	5	2	5	5	5	4	3	5	5	2	1	2	1	3	3	3	5	5	4	1	5	5	4	5	5	2	5	2	1	5	5	5	3	1	1	3
c. Alternative 'monitoring' body	*3.00*		1	3	1	3		2	5	2	3	1	5	3	3	3	3	4	1	2	1	3	3	3	1	1	1	3	1	5	2	2	3	2	3	3	1	5	2	3	2	1	1	3

Figure 9. *cont'd* Huai Kha Khaeng Wildlife Sanctuary Results: Risk Assessment

	RISK SCORES		Local Community *cont'd*																																		Poachers					Tourists						
	Medians / Averages	cont'd from prev. page				Karen												Community Leaders										Watchdog									Poachers					Tourists						
1. POLICY AND LEGISLATION	**3.08**																																															
a. Relevant laws/International Treaties	***3.00***																																															
b. Law Enforcement	***3.17***																																															
Resources	3.50																																															
No of dedicated staff	4.00																																															
Funding	3.00																																															
Seizures and prosecution	3.00		1	2	3	4	2		4		4	5	3	3	3	3	4	3	1	1	1	1	2	3	1	1	3	1	1	4	2	3	4	1	4	3	5	1	4	1	1							
Penalties	3.00		2	3	3	2	4		5		1		2	2	2	2	1	3	1	5	2	1	3	2	1	1	2	5	1	2	1	3	3	1	3	1	3	1	3	1	1							
2. FUNDING AND GOVERNANCE	**2.81**																																															
a. Accountability and Reporting	***2.25***																																															
Roles and responsibilities	2.00																																															
Reporting requirements	2.50																																															
b. Funding	***3.38***																																															
Funding availability	3.00																																															
Funding breakdown	3.00																																															
Reliability	3.00																																															
Re-investment of PA revenue	4.50																																															
3. PA MANAGEMENT	**2.86**																																															
a. PA Staff	***2.88***																																															
Roles and responsibilities	2.00																																															
Number of staff	3.25																																															
No. of staff across functions	3.00																																															
Staff make-up	4.00																																															
Local recruitment	4.00																																															
Staff rotation	4.00																																															
Terrain type	4.00																																															
Popularity	2.00																																															
Staff motivation	3.40																																															
Pay	4.00																																															
Training	3.00																																															
Equipment	4.00																																															
Individual attitude	1.00																																															
Incentive schemes	5.00																																															
b. Communication	***2.83***																																															
Management Reporting	2.50																																															
Own progress	2.00																																															
Comparative	3.00																																															
Visitors centres	3.00																																									4	4	3	2	3	3	4
Links to other organisations	3.00																																															
4. TIGER MANAGEMENT	**2.59**																																															
a. Estimation of numbers	***3.00***																																															
Methods used	3.00																																															
Frequency	3.00																																															
b. Suitability of habitat/ranges	***1.67***																																															
Habitat management	2.00																																															
Abundance of tigers	2.00																																															
Abundance of prey	1.00																																															
c. Anti poaching measures	***2.46***																																															
Understanding of poaching threats	3.50																																															
Target poaching locations	3.00		2	1	5	1	1	4	1	4	2	2	2	2	2	2	3	3	1	1	3	3	3	2	1	4	3	5	5	4	1	4	3	2	2	5	1	1	4	1	1							
Tiger trade potential	4.00		5	5	4	5	3	5	4	5	5	5	4	4	4	3	5	3	5	5	5	5	3	5	5	5	4	5	3	5	4	4	5	4	4	5	4	5	4	5	5	5	1	5	5	4	5	1
Anti poaching staff	3.33																																															
Frequency of patrolling	1.00																																															
PA Boundary markings	2.00		1	1	3	2	1	4	2		2	3	5	5	5	2	5	1	1	1	1	5	5	1	1	1	2	1	1	2	1	4	3	1	2	5	4	1	3	5	5							
d. Education programmes	***3.25***																																															
Visitor awareness	3.00																																									1	1	5	3	5	3	5
Local awareness	3.00		4	2	2	2	5	5	5	5	3	5	1	2	1	5	5	3	1	1	2	5	3	3	5	2	4	1	1	5	5	4	3	3	1	4	4		3	1	1	1			1	2	3	
Group trips	3.00		4	1	5	4	3	5	5	5	4	5	5	5	5	1	5	3	1	1	2	5	1	3	1	1	5	1	1	2	5	3	4	3	2	5	4		4	1	1	1	1	4	1	3	1	
Success indicators	4.00																																									5	5	5	2	2	4	5
5. LOCAL COMMUNITY	**2.94**																																															
a. Human/tiger interaction	***2.67***																																															
Human proximity/density	1.00		1	1	1	1	2	1	2	1	1	1	1	1	2	1	1	2	1	1	1	1	2	1	1	3	1	1	1	1	1	3	1	2	1	1	1	1	2	1	1							
Reliance on materials from the PA	3.00		1	1	4	3	3	1	3	2	4	3	3	3	2	1	5	1	1	1	4	1	1	1	1	5	3	5	1	1	1	3	4	3	1	2	1	1	3	1	1							
Relative economic hardship	4.00		3	2	5	4	1	5	5	3	5	2	4	4	4	3	4	4	5	5	5	5	4	4	4	2	4	5	3	3	4	2	3	3	3	5	3	5	2	4	4							
b. Attitude to tigers	***3.50***																																															
Threat to livestock/humans	2.00		1	4	4	1	1	1	1	1	2	1	2		2	1	2	4	5	1	3	1	5	3	5	3	1	5	5	3	1	2	2	3	5	2	2		3	5	5							
Compensation schemes	5.00		5	4	5	5	5	5	5	5	5	5	4	5	5	5	5		5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5							
Potential $ value	2.00		3	1	3	1	5	1	1	1	1	1	1	1	1	3	1	5	1	1	1	1	5	2	5	1	1	5	3	1	1	5	4	3	3	5	1	1	2	1	1							
Deterrents to poaching	5.00		4	4	4	3	3	3	3	3	4	3	3	3	3	4	2	4	4	4	4	4	4	4	4	3	1	4	4	4	4	4	3	3	4	3	4	4	4	4	4							
c. Involvement in tiger management	***2.67***																																															
Opportunity for discussion	3.00		2	2	5	4	3	4	4	4	5	4	5	5	4	3	5	4	1	5	2	1	3	4	1	1	2	1	1	2	3	3	3	1	2	3	4	1	4	5	5							
Use of local expertise	3.00		3	1	5	3	1	5		5	5	5	3	3	3	3	1	5	1	1	1	5	3	3	1	1	4	1	1	2	5	2	5	2	4	4	5	4	3	1	1							
Relationship with conservation/PA staff	2.00		1	1	4	3	3	3	4	2	2	3	1	1	1	3	1	3	1	5	2	1	1	3	1	1	2	1	1	1	4	2	4	2	3	3	4	1	3	1	1							
6. MARKET FOR TIGER PARTS	**2.83**																																															
a. Existence and access to market	***2.83***																																															
Method	2.00																																															
Available weaponry	3.00		1	1	4	1	2	1	1	2	2	1	2	2	2	1	2	2	1	1	1	1	5	1	5	4	3	1	1	3	1	5	3	1	3	1	3	1	5	5	5							
Tiger availability	1.00		1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	5	1	1	1	1	1		1	1	2	1	1	2	1	4	1	2	1	1							
Market access: routes/traders	2.00		2	1	4	1		4		5	1	4	2	2	2	1	1	2	1	1	1	1	3	1	3	3	2	1		2	1	3	2	3	3	3	3	1	2	2	2							
Motive	3.50																																															
Market	3.00				2	5	5		5	2	1	1	4	4	4	5	3	3	3	5		4	2	4	3	3	2	4	4	4	1	4	4	3	4	4	2	2	2	3	3							
7. TOURISM	**3.50**																																															
a. Revenue generator excluding PA	***4.00***		5	3	5	4	2	5	5	5	4	4	5	5	5	4	5	5	5	5	5	5	1	3	5	4	4	2		5	5	3	5	5	4	5	4	5	4	5	5					1		
b. Promotion of tiger as attraction	***3.50***																																															
By Tour Companies	4.00																																									3	3	3	4	3	1	1
Local awareness of tiger link with tourism	3.00		4	1	5	1	4	5	1	4	5	5	5	5	5	4	5	3	1	5	1	1	1	2	1	1	4	1		4	2	4	3	3	2	3	4	5	4	1	1					2		
c. Alternative 'monitoring' body	***3.00***		4	3	5	1	1		1	3	5	3	2	4	2	1	1	5	5	5	5	5	2	2	1	1	3	5		5	1	3	2	1	3	5	2	1	4	3	3	5	5	4	5	5	5	2

previous good work of the researcher doing the estimating, so the risk score would be expected to increase over time.

*Suitability of Habitat (**1.67**):* The habitat is defined as a high priority, *Habitat management* scoring a lower risk result of ***2***. The *Abundance of tigers* is not bad but could be better, scoring ***2***, and the *Abundance of prey* is also no problem, with low risk at ***1***, so the conditions at Huai Kha Khaeng look promising from this perspective.

*MARKET FOR TIGER PARTS (**2.83**)*: Having noted promise for the tigers in the previous point, there is another part of the picture to cause more concern, if we look across a combination of factors. Despite good *Frequency of patrolling*, scoring ***1***, there is only an average *Understanding of poaching threats*, scoring ***3.5***, and combining this with *Access to weaponry* if needed (***3***), and the difficulty of patrolling the *Terrain type* (***4***) and a still active tiger *Market* scoring ***3*** - this all points to a potentially serious risk if organised trader gangs targeted the Huai Kha Khaeng. A <u>proactive</u> tiger management programme is therefore urgently required if tigers are to succeed in this 'high priority' habitat.

Lastly, two general points that were noted during data collection were:

- Where WWF had worked in villages, there was a positive response to learning about tigers in school lessons.

Surveying children at the local primary school for this research

- Despite commenting on heavy penalties, only 36 out of 71 local community respondents listed the threat of punishment as a major deterrent. However 5 out of 5 poachers stated it as their major deterrent.

d. Three key learnings for the methodology

Being the third pilot site, many of the practical problems with regard to running this type of exercise had been recognised and addressed. However new situations arose and there were still lessons to be learnt.

- An important lesson came even before arrival at the last test location. Logistical arrangements for the Huai Kha Khaeng visit collapsed at the last minute, and it was necessary to try every avenue and ask every contact made throughout the trip, to find a new translator and rearrange transport and accommodation. The investment made in meeting people luckily paid off. *Always remember how important networking is – you may need help or support!*

- Despite thinking all bases had been covered with respect to questionnaires for target groups, there was an unexpected opportunity to interview children in primary and secondary schools, for whom the questionnaires' language would need adapting. *Try to ascertain potential audiences beforehand and/or ensure enough time is built in to adapt and make the most of opportunities.*

- Unlike the other test locations, it was possible to survey a range of local community groups – more time to do this would have been useful, though it was achieved with long days and a lot of local help! *Similar to the previous point, anticipation of target groups is important when planning the schedule and time allocations.*

3.2.1.4 Summary of Protected Area results

This section briefly summarises the specific results for the fieldwork in the PAs. These are then discussed together with the findings in *Section 3.3 Discussion*.

Thailand was chosen to be the pilot Tiger Range State, then three test sites

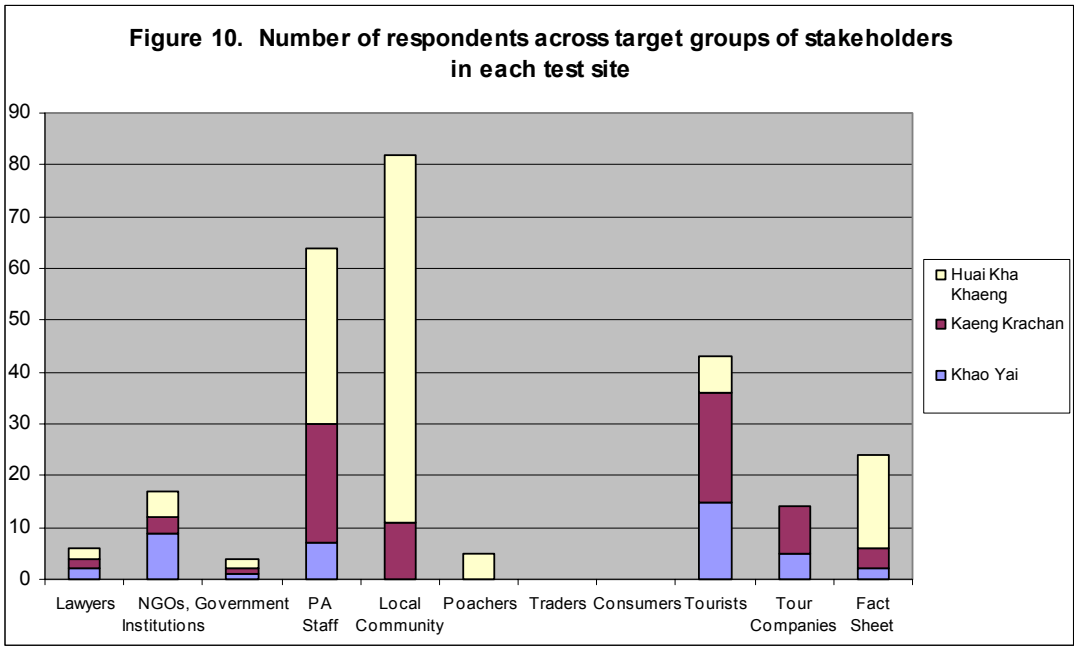
were selected based on tiger presence and human-tiger interaction, i.e. locations where tiger research was in progress or planned, and/or community outreach programmes were underway to address poaching.

The three Protected Areas selected were

- Khao Yai National Park
- Kaeng Krachan National Park
- Huai Kha Khaeng Wildlife Sanctuary

Each PA was visited with the purpose of collecting data to populate a scorecard to indicate the level of risk of tiger poaching at that location. The target groups to be surveyed were identified through a stakeholder analysis of who would hold information regarding the factors listed in the scorecard. The technique used for collecting data from the various target groups was a standardised set of questionnaires. For each target group, the questionnaire sought answers to the subset of factors relevant to them, from the overall scorecard.

A summary of the distribution of respondents across the target groups of stakeholders for all locations is shown in **Fig. 10**.



A summary of the breakdown within these target groups is shown in **Table 5**. Two points worth noting are:

- Although identified as stakeholders, in the interests of time, the following target groups were not sought out as part of this pilot study: observer NGOs (i.e. those NGOs present but not currently funding or implementing relevant programmes), traders and consumers. However regarding the latter two, the Fact Sheet (a brief questionnaire to collect general poaching and PA information) elicited some trader and consumer information - see **Appendix F.**
- The overall total of questionnaires is 6 less than summing the totals for the Protected Areas. This is because the two lawyers and central government contact answered at a general level for Thailand so were counted once in the overall total, but their information was used as the backdrop for each location i.e. counted in each.

Table 5. Breakdown of respondents to questionnaires, by target group

	Lawyers	NGOs/ Institutions	Government	PA Staff	Local Community	Poachers	Traders	Consumers	Tourists	Tour Companies	Fact Sheet		
Central	2	9	1								4		
PA Level		8									1		
Observer		x											
Superintendent				4							1		
PA Office Staff				31									
Rangers				27							2		
General			1	1	10	5	x	x		14	5		
Karen				1	13						1		
Watchdog					9						9		
Monks					13								
Primary Students					10								
Secondary Students					6								
Teachers					11								
Community Leaders					10						1		
Foreign									24				
Local									19				
	2	**17**	**2**	**64**	**82**	**5**	**0**	**0**	**43**	**14**	**24**	***Total***	***253***

Lastly, a summary of the risk profile across each of the three Protected Areas is shown in **Table 6** (again, note that the Medians/Averages columns have been used – see *Chapter 4. Further Data Analysis*). Individual points of interest were discussed under the relevant PA. A general discussion indicating how to sensibly compare parts of this profile is covered later in *Section 3.3.1 Comparing and contrasting the experiences in the PAs.*

Table 6. Risk profile across the three pilot PAs

	Khao Yai	Kaeng Krachan	Huai Kha Khaeng
1. POLICY AND LEGISLATION	3.67	2.75	3.08
2. FUNDING AND GOVERNANCE	2.69	2.38	2.81
3. PARK MANAGEMENT	2.54	3.01	2.86
4. TIGER MANAGEMENT	2.85	2.95	2.59
5. LOCAL COMMUNITY	2.97	3.12	2.94
6. MARKET FOR TIGER PARTS	3.36	3.40	2.83
7. TOURISM	3.17	3.17	3.50
	21.25	**20.70**	**20.61**

3.2.2 Summary of findings with regard to the test TRS (Thailand)

There are 77 National Parks and 36 Wildlife Sanctuaries in Thailand, and overall conservation areas cover around 13% of the total land area of the country (Stewart-Cox and Cubitt, 1995).

The general findings for Thailand have been logically reviewed against the categories of factors listed in the framework.

1. Policy and Legislation

Recently the government has been promoting National Parks as a national asset, and presenting government policy to improve "cash flow" i.e. revenue from this asset (pers. comm. at Superintendents Conference, August 2002). Eco tourism, particularly for Thai tourists, is being encouraged. This project

observed the impact of this policy on the PAs and the biodiversity within, and concluded that this policy is designed to make profit, not to conserve or invest in biodiversity.

Regarding legislation, Thailand has been a signatory of CITES since 1973 (with ratification in 1983) though it was not until it was faced with wildlife trade sanctions under CITES in 1991 that corresponding domestic legislation was adopted. The legislation introduced was the Wild Animals Preservation and Protection Act, B.E. 2535 (1992), and under this, hunting wild tigers as well as trading in parts and products of tiger, whether wild or captive bred, is banned (Banks, 2001).

Presently, however, general law enforcement is poor and patchy. The staff in the Wildlife Protection Section of the RFD Wildlife Protection Division are very dedicated and work long hours following up on intelligence received. At the PA level, enforcement is more complicated, as the PAs usually span a number of provinces and offenders must be taken to the relevant district or provincial police station depending on the location of the crime. This can take up time and resources, and meant that it was sometimes considered 'not worth the time and effort'. Also the attitude of the provincial police towards wildlife crimes appeared to be somewhat unreliable, according to passing comments made during the fieldwork. They were cited in a number of conversations as being involved in poaching incidents, though this was not something documented or proven.

A number of people surveyed stated penalties were quite strict, but they also said that wildlife poaching is continuing, so the implication has to be that people do not consider the risk of capture too great.

According to the lawyers and NGOs surveyed, there is no central record or database of wildlife crimes or associated punishments, so it was not possible to review the trends in poaching offences for any comparison or comment. An 'audit trail' of this type was available for peninsular Malaysia 1990-1998 (Nowell, 2000), so this can be noted as a case of best practice to share.

2. Funding and Governance

This category is included to reflect the differing funding and governance models for particular Tiger Range States. In Thailand, the National Parks and Wildlife Sanctuaries are managed centrally by the RFD, who govern and fund the Protected Areas directly through a PA Superintendent at each location, who then has complete control over that PA, i.e. there is no management influence through provincial government. However, regarding revenue, a portion from the National Parks does go to local government and the rest to the RFD – the breakdown quoted by the Superintendent for Kaeng Krachan was that 10% of PA revenue is kept for park use, 5% goes to local government and 85% goes back to the RFD with a partial redistribution back to the NP of about 70%: hence there is a link and a benefit to the local government in a financial way.

As mentioned previously, the Wildlife Sanctuaries may be less clear and simple as the staff units within them report to two central RFD Divisions. All research money for the Wildlife Sanctuary goes to the central RFD before being allocated to the sanctuary in question.

In summary, central government controls the purse strings, and the PA Superintendents have almost complete local control. Formalities matter in Thailand, and it is important to secure the necessary permissions and spend time with appropriate government staff before fieldwork - subsequent research then runs much more smoothly at the PAs.

3. Protected Area Management

In Thailand, the PAs are basically just areas of landscape that have had a nominal border drawn around them. This does not always equate to the land being uninhabited or wild or, in most cases here, protected in any realistic way. There are villagers living both in and around many NPs, who are farming and in many cases still hunting for forest products, be it for subsistence or commercial

sale. Sometimes where villagers have been relocated from PAs, they have been replaced by numerous PA staff and their associated family members, forming a community larger than the previous occupants, for example in Khao Yai National Park.

At the three PAs visited during fieldwork, it was found that people from outside the Protected Areas can enter easily, either knowingly or due to inadequately marked boundaries, and there is limited patrolling done by the rangers, who often stick to familiar tracks, and patrol only in certain areas of the park around their base e.g. HQ or substation. Hunting, encroachment and environmental degradation therefore go largely unchecked. Khao Yai is held up as a model National Park, it has had an extensive Outreach programme (Khao Yai Conservation Programme) running for approximately 3 years, yet poaching is rife.

From the PAs visited, and from further personal communication, the conclusion is that the Thai approach to National Parks is as follows:

- designate an area, usually no matter what its current land use
- build an ostentatious Headquarters
- hire a small number of permanent staff who have some form of benefits such as medical cover as well as their salary
- staff the rest (the vast majority of administrative staff and rangers) on a temporary status with low pay and no benefits
- provide minimal standard training, much of which is logistical rather than detailed knowledge of the forest or wildlife.

Overall there appears to be a tacit assumption in Thailand that if an area is labelled as a National Park, and a showy HQ is built, then people and money will start to arrive. The associated activities of Protected Area existence, such as knowledge and education, protection and research, are at best limited.

The situation at the Wildlife Sanctuaries seems more under control with more serious patrolling, yet even there it is hard to see how they could protect the

sanctuary from a well-funded and sustained attack from organised wildlife traders.

4. Tiger Management

Knowledge of tigers was depressingly scarce from conversation with the rangers during the research. In some cases they could talk animatedly about other large mammal species, e.g. elephants in particular but also leopards, however the tiger was an elusive subject. The only research focussed on tigers was through WCS, active in Khao Yai and Kaeng Krachan presently (as well as some other PAs that were out of scope), and some previous research in Huai Kha Khaeng down to the efforts of one man and not continued since his departure. Tigers were rarely seen any more though old reports were reasonably common, implying there used to be a far greater number than there are today. No effort was apparent either centrally or by PAs to share tiger knowledge or tiger conservation strategies within Thailand or with other TRSs. With little research or protection, it seems that wild tigers are almost surviving in Thailand by mistake.

5. Local Community

This has already been covered in the Protected Area Management section with respect to local communities living in or around the PAs. There are now a number of programmes beginning to recognise the importance of involving local people in the management of PAs on their own doorstep, but this will take some time to filter through. Many villagers are poor and open to incentives from middlemen to continue to hunt. From reports received during fieldwork, tiger killing almost invariably took place in the forest; human-tiger conflict outside the PAs was negligible and dismissed by local people throughout surveying.

Several sources in different locations said that traditional hunting skills were not being passed on, which will affect the level of poaching over time.

A final point about local communities is the observation regarding 'who is truly local'. A number of hill tribes move around the area and, unlike Aborigines who have traditionally lived in harmony with nature by living sustainably in a particular place, some of these tribes farm and hunt for a number of years in one place then move on when it becomes degraded. As well as the environmental implications, this also has implications for land rights as well as the ability to draw on local expertise of that environment, traditionally built up over many generations.

6. Market for tiger parts

There is clearly still trade in tiger skins and products, often of local manufacture, with Bangkok providing the hub (Banks, 2001). The view of the Head of the RFD Wildlife Protection Section is that most tigers traded in Thailand are from neighbouring countries, but out in the field others spoke of an underground trade still occurring in and around the PAs.

Thailand does not have many wild tigers left and this seems to afford them at least a little natural protection, as the general perception is that they have already disappeared and so are not worth seeking out – they are therefore allowed to exist almost in secret away from local people and PA staff.

However, there continue to be a number of factories in Thailand manufacturing tiger products, and the ingredients are supplied from somewhere, going largely unchecked by the authorities (Banks, 2001).

The consensus was that if rich people wished to hunt or have a tiger hunted then it was still entirely possible and not that difficult. A typical story was that weapons, food, etc. would all be provided for the trip as well as (obviously) a handsome price for the tiger. It was also common to hear that corrupt senior government, army, border police and normal police officials may be involved.

The motive for poaching was consistently money, not the threat to the safety of

humans or livestock. Animals were considered easy to find by poachers waiting near water or salt-licks, and only very few commented that this easy access may be disrupted by rangers on anti-poaching patrols.

All parts of the tiger are used as noted previously, and a number of reports said that they ate the meat (or sold the excess), which differs from some other feedback that the taste is too strong and the meat is left in the forest.

When poaching occurred it was using a variety of methods but the most common result was guns, from homemade guns to AK47s, sometimes having snared the animal first or left out poisoned bait. A tiger can be killed, skinned and boned within a very short time, often ending up in just a few plastic shopping carriers with the skin rolled up in a small ball around the skull and the bones and meat in separate bags. These are then casually carried out of the forest on foot and maybe even home on public transport, without drawing attention to the grisly 'shopping'. Access to roads and vehicles is therefore not rate limiting.

Apparently skins are not uncommonly on open display at the border towns, particularly those on the border with Myanmar, but these borders were closed at the time of research so no products were seen on public display. Whether these are sourced from Thailand or outside is not really known as there is no specific tiger intelligence team, only periodic NGO investigations.

7. Tourism

Tourism is big business for Thailand but mainly as a 'beach and back-to-basics hill tribe trekking' destination. The vast majority of those visiting Protected Areas are Thai, not foreign.

With regard to tigers in National Parks, although Thailand views its NPs as a national asset, wild tigers are not currently promoted as an attraction unlike for example India or Nepal, which benefit directly from 'tiger tourism'.

For visitors to Thailand's parks, facilities are minimal, particularly those to attract foreign visitors, such as information in English e.g. wildlife or trail guides, yet foreigners pay ten times (200 baht = ~£3) the entry fee of local visitors (20 baht = ~30p). Those that did come were expected to be with a tour, usually providing their own forest expertise through the tour leader. This reduced the direct revenue and encouragement for the park. Thai tourists usually stayed on the edge of the forest, e.g. at the HQ or waterfall picnic areas, where they socialised then left without entering the forest interior. In contrast, foreign visitors arrived with hiking gear and embarked on long walks deep inside the forest. Most Thais stated that they would be horrified to actually see a large mammal, unlike their foreign counterparts, who were often visiting with the hope that they would spot a tiger or elephant.

Unlike National Parks, Wildlife Sanctuaries are not open for tourism, but are areas reserved for research and biodiversity conservation. However visitors still come for education purposes and in Huai Kha Khaeng there are better facilities such as information centres, naturalist guides and accommodation.

There were Visitors Centres at each of the pilot PAs, but these were rarely entered by tourists and had little useful information, the bulk of which was only in Thai. Khao Yai was the only PA to have tiger information present in its Visitors Centre, and this was mainly to present two stuffed tigers and a display skin, with associated stories of these tigers' fates. There was virtually no general information about the species and no reference to the threats to its existence, so this opportunity was wasted.

It is clear that the current approach to managing NPs in Thailand is doing little to leverage benefit for the parks from tourism. The majority of tourist money is going to tour companies and private hotels, and the opportunity to educate these tourists is also in the hands of those same private companies. For tourism to make a positive contribution, improved facilities would need to be provided, with available revenue going to the parks not lining the pockets of

private businesses. Basic facilities would include rangers acting as guides with good forest knowledge, information leaflets such as trail and wildlife guides, accommodation and food.

With respect to revenue generation for local people from tourism or educational visits to the PAs, there is often little or no financial benefit to their communities. A few people ran private businesses providing restaurants or accommodation and, in Khao Yai, handicrafts were sold in the park shop in the Visitors Centre, but in general there was no formal provision of revenue from the Protected Areas back into the overall community. In this sense there is little understanding of the positive potential of tourism.

To end on a more positive note, a rewarding finding was that people seemed generally happy to talk and tell the truth, as far as one could tell, and when they felt strongly, they did not seem to hold back. From the tiger perspective, it was noted that the wide range of books on Thai National Parks and wildlife all had photographs of tigers prominently displayed, so there appears to be at least a little pride in their presence. Although wildlife conservation in Thailand looks bleak on the surface, public awareness and conscience appear to be increasing, so it is hoped that this will make a difference before it is too late, particularly for many of the large mammals, including tigers.

3.2.3 Findings relevant to the methodology

The findings identified during the pilot risk assessment with regard to the methodology can be broadly split into two areas: a) content and b) process.

The main technique chosen for data collection was use of standardised questionnaires, to ensure consistency across many target groups of stakeholders. Where structured interviews were conducted, these followed the same content as the questionnaires. The key points concerning content are examined first.

a) Content of the methodology and framework

The ability of the target audience to comprehend information presented to them is fundamental. Problems were manifested through variable quality of answers, depending on the understanding of individual respondents and their 'sympathy' with the project. The latter general point was addressed by spending some introductory time briefly outlining the project and emphasising the importance of including input from all perspectives, from those positively as well as negatively affected by conservation activities. Once people felt assured of the desire to best represent their views, there was a reasonable enthusiasm to help with data collection.

Some specific findings in relation to audience comprehension of the questionnaires themselves are outlined below.

Firstly, the questionnaires needed to be adapted to be more intuitive. Points were noted regarding the style of answer, the language used, the order and relevance of questions, and use of examples.

- *Style of answer:* this was designed to be standardised and simple, requesting a circle around a number in a scale of ***1-5***. However, the original framework was set up as a risk assessment, such that a higher number on the scale implied a higher risk. This scale had to be reversed in many cases if there was a more intuitive way to respond. For example, the framework considers if there are enough people enforcing wildlife protection legislation, and marks inadequate manpower as high risk (***5***), but respondents intuitively answered the question by saying that enough people = ***5***. The wording of the question was therefore adapted to the scale being reversed as follows:

> Do you consider the number of staff dedicated to enforce legislation enough? (compared with other crime areas e.g. drugs) Please circle one number.
>
> **1 2 3 4 5**
>
> insufficient = 1 5 = adequate

Where this adaptation was made, it was then necessary to reverse the answers during data analysis to provide the risk assessment.

- *Language* used: there were several aspects to this, namely simplicity, appropriateness, and use of translation.
  - It was found that despite best efforts to keep it simple, wording of questions still needed to be adapted to fit use in Thailand. Examples of this included the common English nouns 'pay' and 'wage' not being recognised, but the more formal term 'salary' being understood; a question referring to how people 'felt' about NGOs and park staff was not understood as people in Thailand do not use the verb 'to feel' in this context, it had to be changed to ask how they 'thought' about these bodies. It was important to identify and correct any confusions of this type with a translator before surveying started.
  - Appropriateness of wording is similar but refers to being prepared for the same basic set of questions to be pitched at the correct level to suit different groups of respondents. Some of these were well educated, others not. At the last test location, there was an unanticipated opportunity to survey schoolchildren, and the Local Community questionnaire had to be adapted verbally at a series of facilitated sessions in three schools. It was clearly important to know the audience as early as possible to give time for preparation.
  - Regarding translation, inability to speak the local language was definitely a barrier. Three approaches were used during the fieldwork, and the resulting pros and cons of these are discussed later in **Box 2** in *Section 3.3.1*.

- The *order and relevance* of questions: from the original framework, there were 57 data points for which to collect answers through the questionnaires. Each target group of stakeholders was only asked about information felt to be relevant to them, i.e. a subset of questions from the overall scorecard. As this was a standard questionnaire to cover all Tiger Range States, some

questions were not directly relevant to Thailand, for example, tigers are not promoted as a tourist attraction – this was addressed by explaining that this was the case in some countries, and people were happy to mark the form accordingly for the current situation in Thailand. Questions were rearranged to flow most intuitively, and although some people noted they did not know a particular answer, there were only a very few cases where people protested that "I don't know as that isn't my job". The finding was therefore that the questions had generally been posed appropriately.

- *Use of examples*: the last point to aid comprehension of the questionnaires was to provide examples in the questions wherever possible. One example is shown above, where the manpower dedicated to enforcing wildlife protection legislation is compared for example with other areas of crime e.g. drugs. Another example of this was in ascertaining whether there were any incentive schemes in place in addition to payment of salary, and the examples given were bonuses, medical insurance, sick pay, holiday pay etc.

Anticipating the potential audiences was the key to all the above issues. It was possible to act upon all the feedback in making the questionnaires more intuitive, but it was important to remain cognisant of the significance of the original meaning or intention in measuring a particular factor in the framework, and not lose this by conveying a different message through simplification. It is also important to note that any adaptation increased time spent matching answers back to factors in the subsequent data analysis phase.

Having reviewed whether the content was intuitive, the next perspective considered completeness of the questionnaires, e.g. whether the right categories and factors had been included.

- *Coverage*: experience from the fieldwork showed that the categories and factors were generally appropriate, as there were no missing areas raised during the surveys or interviews. A few questions were identified that could

have been split to convey a tighter response e.g. people sometimes had a different attitude to NGOs than to PA staff yet only one general question was provided to sum up relationships with those undertaking conservation activities. It was also mentioned by several respondents that PA managers' commitment to their job may be different from their staff, but there was just one question to cover all PA employees. Refining the questions to enable exposure of a greater level of detail is an important topic and is discussed in *Section 3.3.2 Implications and applications for the framework.*

- *Length of questionnaire*: the length proved to be important, as people's time, and sometimes attention span, could be limited. Beyond the primary questions, an appropriate balance had to be struck when choosing further questions where answers would provide a useful crosscheck to others' input.

- *Opportunity for additional information*: regarding space for additional comments, this was not catered for in the design, or initially encouraged through the style of answering (Scale ***1***-***5***). The reason was that this was intended as a rapid risk assessment tool, and free format text is harder to analyse swiftly. Findings from the pilot study showed however that this was too valuable an opportunity to miss, as often people found it easier to make a comment or tell a story than categorise an answer. Although text is harder to analyse automatically, the sense of it often gave valuable insight and gave rise to some new ideas regarding style of data collection (see *Section 3.3.2 Implications and applications for the framework).*

A couple of general points worth finally noting are as follows. The pilot study showed that the scorecard was successfully used for many types of stakeholders, i.e. the framework worked as hoped, in being relevant and usable for many levels of 'data owners'. The style of answer was considered above, but there was also a key finding regarding the overall nature of the questions – a general decision was made during development of the framework to measure opinion not fact, as this was anticipated to be easier and potentially less

threatening to respondents (see *Section 2.3*). The fieldwork revealed that it can be far harder to apply a standardised measure to opinion than fact. An example of this concerns management reporting, where one question asked if this is done regularly and frequently: some respondents answered with a ***5*** (the scale ran from ***1***=*no reporting in place* to ***5***=*regular and frequent documented reports*), but when pressed for further information, said reporting was only done when they had time, others responding with a ***5*** stated they reported monthly. The finding was that in some cases it is easier and more consistent to collect fact than opinion. A standard measure can still be applied but by using facts then categorising these.

b) Process of implementing the methodology

From the process perspective, there were five main findings during the fieldwork:

- *Permissions*: although the fieldwork involved talking to people rather than work in the forest, it proved beneficial to obtain the necessary government permissions to undertake this research before visiting the PAs. Central government officers contacted the management of each PA, informed them about the project and asked them to provide assistance. It was also advantageous to meet first with the Superintendent upon arrival at each PA. When this was possible, the requirements for the research were discussed and planned jointly, and the process ran much more smoothly. In the case of the last test location, the Superintendent was on holiday, and it was consequently slower to secure time with the PA staff.

- *Using a translator:* leaving aside the question of translating the actual documents, a key finding from the first PA was that it was vital to have a dedicated translator for conversation during research. Even when assured that people at the PA spoke English, this was not found to be at a sufficient level to conduct the survey. The translator had to have good enough use of English to be able to converse swiftly during fieldwork, otherwise

information was lost when follow-up questions could not easily be pursued.

- *Preparation*: having employed a translator, it was critical to ensure time was built in to 'train' him/her, which consisted of working through the questionnaires, confirming the emphasis, preparing suitable introductions for those who need to know more about the work e.g. PA Superintendents, versus those respondents who just 'want to get on with it'. This investment of time paid dividends during fieldwork, and had a direct and noticeable effect on data quality.

- *Facilitation*: during completion of the questionnaires, the interviewer and translator played an important facilitation role, clarifying questions, watching for confusion or collaboration, encouraging additional relevant information and at the end ensuring the forms were complete. One example of the way this affected data quality was when respondents did not know the answer to a question - when this was made known, an appropriate response was recorded e.g. DK for Don't Know, but some had already ringed the middle option of ***3*** when they were not sure. Some followed their neighbour and changed from their original answer to a DK when it was discussed. Lastly, when questionnaires were filled in out of sight, for example, with poachers, the forms sometimes came back incomplete or with answers that could be interpreted different ways, so this also proved that the facilitator role was beneficial.

- *Grouping respondents* is more efficient, but there were associated problems, such as people copying from each other or discussing the answers then recording the same results. Generally the efficiency advantage outweighed the problems as these could be addressed by emphasising at the outset that it was their individual opinion being sought, then reinforcing this through the facilitation during the survey.

Surveying rangers at Huai Kha Khaeng

Following the fieldwork, the data analysis was rather cumbersome and would need to be streamlined for future studies. The process used was to enter all the results from the questionnaires, then map these back to the original framework, calculating summarised values by factor and category in a scorecard for each PA. As this was a test run, these steps were performed manually and were time-consuming despite the relatively low sample numbers of respondents. There are opportunities for parts of the process to be automated, but it may be more appropriate to re-think the data collection techniques before investing time in automation. This is considered further in *Section 3.3.2 Implications and applications for the framework* and *Section 3.5 Recommendations from the testing phase.*

3.3 Discussion

It is important to remember that this is a feasibility study, so the main focus of the discussion is around whether there is value in the concept of a rapid risk assessment of the poaching threat to tigers in PAs, and the practicalities of trying to evaluate factors to provide such an assessment.

The aim of this discussion section is to tie together the results and examine what they indicate in a broader context, together with considering the implications beyond this project and suggestions for future work.

Where logical to do so, many individual findings have already been discussed in the previous *Findings* sections. The next section looks at comparing and contrasting the experiences across the three pilot sites, leading to a discussion on the implications and applications for the framework based on all the experience gained throughout the project, and how this work could be developed over time.

3.3.1 Comparing and contrasting the experiences in the PAs

The pilot studies took place in three locations, two National Parks and a Wildlife Sanctuary. Each was chosen as it provided a different perspective. The purpose of testing in multiple locations was to enable comparison and contrast.

The aims were to

a) receive feedback from a range of people regarding the concept
b) identify necessary adaptations/improvements that could be easily applied at each stage to improve the next test
c) record adaptations/improvements that would need to be applied later as part of future refinement of the model
d) examine how the framework stood up to use in new and different situations
e) give an indication of how the resulting scorecards could be usefully compared.

Note that as this was a test run, only preliminary results were gathered at the pilot sites, and these should be taken as an indicative not a definitive risk assessment. Consequently, some comparisons will be made as a demonstration of the potential use of the tool, but detailed conclusions will not, and should not, be drawn without further research. Two examples to emphasise this are, firstly at Khao Yai NP it was not possible to visit the local villages, so information was only gathered regarding the local community from the perspective of the park staff and people related to the running of the conservation programme i.e. clearly a biased sample; secondly at Kaeng Krachan NP, it was only possible to survey villagers outside the park, whereas those remaining inside the park are known to be the main hunters - again this gives an incomplete data collection. The overall risk assessments for the PAs should therefore be treated with caution, but do provide at least an indication of the level of risk, and an excellent testing ground for the model, as well as a sample upon which the approach to comparison can be demonstrated.

Each of the aims identified above is now discussed following experience in the field.

a) Receive feedback from a range of people regarding the concept

At each location, the concept, the principles of the framework and the factors included were briefly introduced to everyone, and discussed in more detail with certain key people such as the PA Superintendents and those running conservation programmes. The feedback regarding the concept across the range of people was that it seemed like a sensible idea, and that there was currently nothing of its type in operation. As with feedback from the initial review in the UK, there was a comment that there were a lot of complex areas to examine, but nothing was identified as missing or unnecessary.

There seemed to be particular appeal for those running conservation or education programmes in and around the PAs, as they spotted an opportunity for capturing these as examples of best practice. It was therefore important to them that the surveys included stakeholders who were participants in the programmes, and this helped in gaining access to certain target groups. Obviously these had to be balanced with people outside such programmes where possible. This is one of the intended purposes for the model – that it be used as a vehicle to highlight problems and solutions - so this was very encouraging.

b) Identify necessary adaptations/improvements that could be easily applied at each stage to improve the next test

A good number of easily applied adaptations were identified at each location and were used to make improvements for subsequent tests. Many of these were discussed previously in the *Results* section for each Protected Area, under *Key learnings.* It was very valuable to be able to iron out difficulties and streamline the process then view the effects dynamically. There was a marked improvement in data quality and completeness by the third and last pilot site, and this was directly attributable to the ability to adapt. Examples of adaptation made to the questionnaire were to the style of answer (changed from an

immediate risk assessment to a more intuitive answer that could be converted later), and to the language (changed to suit Thai culture and terminology). The best approach for translation was also explored and is discussed further in **Box 2** below.

Box 2. The language barrier: how far to go with translation

Inability to speak the local language can prove to be a real barrier. Given the remote locations of wild tigers, use of English is often uncommon and one or more dialects may also be encountered. Yet with the nature of this work, communication is vital. The problem was partially overcome by the style of questionnaire, with answers marked by circling a number in a scale of ***1-5*** (see **Appendix B**), but there were often extra comments and interesting stories to capture, and of course to get answers, the questions must first be conveyed to the respondents in an understandable way.

During the fieldwork, three different approaches were used for posing questions.

The first approach was to survey those with some English directly in English, sometimes with local help, e.g. a secretary or receptionist who was put forward to translate for her boss. This generally proved slow, but the interviewer was mainly in control of what is being asked and could guide the emphasis of the questions.

The next approach was to hire a dedicated translator, spending preparation time working through the questionnaires to explain background and emphasis, and to discuss difficult words or concepts. The translator then surveyed respondents in Thai. Follow-up questions were asked, and any additional comments were translated back into English. This was successful in terms of response quality, but proved slow as the translation time became rate limiting.

The last approach was to translate the questionnaires and hand them out to appropriate target groups of stakeholders. Sometimes the interviewer and translator were present whilst the forms were being completed, but in some cases, this was done out of sight either for logistical reasons, or occasionally for security reasons e.g. poacher information. Using questionnaires in Thai was obviously faster as more people could answer in parallel, but there was loss of control with respect to any potential misunderstanding of questions, also in asking follow-up questions where forms had been passed on. Of these, some forms came back only partially completed together with comments that could be misinterpreted, whereas these problems were addressed at source when the surveyors were present.

Translating all the documents solves some problems – those of efficiency of interviewing and a standardised question approach for all respondents, but it means dependency on the quality of the translation and sometimes loss of control as the surveyors no longer need to be present as intermediaries. This can affect data quality and completeness.

As this fieldwork was a pilot study, an initial decision was taken not to translate the questionnaires, mainly for logistical reasons of cost and turnaround. There were 14 basic questionnaires, each between one and five pages long, and these were being adapted between PAs, based on areas identified for improvement. To not adapt would have meant repeating mistakes and not capitalising on opportunities. The pilot study showed that the key issue of translating the questionnaires is efficiency versus potential loss of control.

On balance, the conclusion regarding translating is to use a combination of the above approaches. It is crucial to have a translator, but the final data quality is wholly dependent upon the quality of the translator and translation. The preparation or training time is vital, as there is little opportunity to interject once a survey is underway in the local language. The key issue is a translator with good enough English that both the language and the necessary emphasis of the questions are clearly understood. Grouping appropriate respondents is more efficient, then with the translator and interviewer acting as facilitators, misunderstandings can be spotted and clarified and additional comments encouraged. If forms must be answered out of sight, then it is recommended the 'go-between' should be trained to look for basic items such as answering as many questions as possible (checking completeness), and ideally have been a respondent themselves so they understand the nature of the exercise.

Adapting along the way does however have logistical implications and in some cases complications. Preparation for each pilot site involves identifying the right questions for the likely target audiences, and printing enough copies of the questionnaires. Making changes between sites meant that a number of the questionnaires had to be updated and re-printed. This has time and cost implications, and requires access to facilities, such as a PC, printer and photocopier. If the forms have been translated, that adds an additional complication as there is a turn-around time to consider as well as the cost. There is therefore a balance when deciding which adaptations will reap the benefit. These types of issues were recorded, and would form part of a User Guide for subsequent risk assessments using this methodology (see *Chapter 6 Recommendations for further work*).

c) *Record adaptations/improvements that would need to be applied later as part of future refinement of the model*

A number of other adaptations and improvements were recorded that would need to be addressed later as part of future refinement of the model. At each location, findings were recorded as well as data being collected through the questionnaires. If a finding turned out to be true for all locations, then it automatically became a note for future refinement. One key example is that some questions need updating, both to tighten the answer and to be able to relate it more clearly to risk, e.g. asking if local people knew of a tiger trade around the PA: the scale ran from ***1****= little or no knowledge of trade* to ***5****=good knowledge of trade*. It was not clear to people how to respond if they felt they had good knowledge that there was no trade. This was not something that could be tweaked by language and this, as well as some of the other factors, needs to be re-thought in terms of the intention and measure. A second example is the abundance of tigers: would a healthy population indicate high risk (a poaching target?) or low risk (obviously protecting them effectively). This factor needs to be reconsidered in terms of its relation to risk.

Another key finding for the methodology to be addressed in future revisions of the framework was that it turned out to be easier to measure fact than opinion in a number of cases. A further example of this was asking if estimating of tiger numbers was done on a regular and frequent cycle – many answered that it was, yet if pressed, they could not estimate how many tigers were in the Protected Area, or identify colleagues who could. This factor therefore needs to be reassessed in terms of its measurement.

d) Examine how the framework stood up to use in new and different situations

Testing in multiple locations allowed examination of how the framework stood up to use in new and different situations, albeit in only one country at this stage. At each pilot site, a new challenge presented itself, so this proved a good test. At the first PA, surveying had to be adapted around people's time, both for surveying and for help with logistical arrangements e.g. visiting local villages. At the second PA, there were many park staff all wanting to be surveyed at the same time, and following this there was access only to villagers outside the park, rather than the hunting community inside. At the third PA, there was far more opportunity for local community surveying, with a wide range of new target groups available.

Across all the PAs, tigers seemed almost inconsequential: in Khao Yai, people still thought they were present without seeing them, in Kaeng Krachan no-one had seen one in some years including the rangers, only in Huai Kha Khaeng was there any confidence that tigers were there in healthy numbers, as rangers still saw pugmarks relatively regularly, even though they were not actively looking for tigers. Knowledge of tigers and caring about their future was distinctly limited, from local people right through to rangers. Yet all this forms the environment in which these wild tigers are surviving, and hence led to the suggestion for a holistic approach across all Tiger Range States, to share expertise and balance investment according to a coordinated strategy. Leaving tigers to their fate without active conservation measures has resulted in plummeting numbers with many now in scattered unviable populations.

Through the pilot studies, people were surveyed across different levels of knowledge and education and representing different economic and cultural backgrounds and perspectives, with the process being adapted to fit. The basic methodology was robust, in that it could be adapted, it had something for everyone in the content, and was successfully applied at the varying levels.

Although there were lessons learnt, they indicated refinement rather than abandoning the concept. The lessons are also contributing to content for a User Guide for future use. An important outcome across all PAs was that to get a true risk assessment, the most representative samples of stakeholders must be identified, access to them must be arranged and ways sought to facilitate their input.

e) Give an indication of how resulting scorecards could be usefully compared

This last component of discussing experiences across the PAs is to demonstrate use of the framework as a comparison tool.

Firstly, during expert review in the UK, a contact at TRAFFIC expressed the view that most tiger killings arose from tigers posing a threat to humans or their livestock. Research in Thailand showed this not to be the case here – across all PAs, tigers were reported to be killed in the forest through either targeted tiger poaching or opportunistic general hunting for wildlife (other than just two cases where sick and old tigers came into a human settlement). Backing up this finding, comparison of all the risk results across the PAs in **Table 7** shows below average risk for the factor assessing *threat* (on a risk scale of ***1-5***: the lower the number, the lower the risk) as follows:

Table 7. Comparison of the risk results across PAs pertaining to threat to villagers from tigers

	Khao Yai	Kaeng Krachan	Huai Kha Khaeng
Threat to livestock or humans	2.00	1.00	2.00

Generally, it was found to be easier to use the scorecard results in combination with the additional information acquired during surveying, as this often gave pointers on where to look in the results for areas of interest. For example, it was discovered that an Outreach programme with a wildlife monitoring branch had been operating in Khao Yai NP for 3 years, and an Outreach programme was also operating at that time around Huai Kha Khaeng for some parts of the community, as opposed to nothing of this type in Kaeng Krachan NP. Let us therefore look at a likely effect from their work: *LOCAL COMMUNITY Involvement in tiger management* through discussion and use of their expertise. Individual factors can be compared across PAs, but it is well known that many aspects are inter-linked, so the following example in **Table 8** examines three relevant factors in parallel that make up *Involvement in tiger management*: a) *Opportunity for discussion*, b) *Use of local expertise*, and c) *Relationships with conservation/PA staff*. Note that for this example, a split has been made below for Huai Kha Khaeng between respondents in or out of the Outreach programme. This was not possible for Khao Yai as the data was not available.

Table 8. Comparison of the risk results across PAs pertaining to local community involvement in tiger management

	Khao Yai (overall)	Kaeng Krachan	Huai Kha Khaeng (overall)	Huai Kha Khaeng (Outreach)	Huai Kha Khaeng (not Outreach)
Involvement in tiger mgmt	***2***	***3.33***	***2.67***	***2.67***	***3.33***
a) *Opportunity for discussion*	2	4	3	3	4
b) *Use of local expertise*	2	4	3	3	3
c) *Relationships with conservation /PA staff*	2	4	2	2	3

Given that within a scale of ***1-5***, the higher the number, the higher the risk, it can be seen that where the Outreach programmes have been operating, the risk is lower (underlined) for these particular factors of a - c. This then rolls up to give the associated result for *Involvement in tiger mgmt*: Khao Yai=***2***, Huai Kha Khaeng (overall) =***2.67*** as opposed to Kaeng Krachan=***3.33***. This can also be seen within the Huai Kha Khaeng result, where the risk result just including those in the programme is ***2.67*** versus ***3.33*** for those not in the programme.

In order for effects of investment to be examined, the factors likely to be related must be identified, and then the results can be compared. Another and perhaps 'purer' comparison (given the complex circumstances unique to each location) is to repeat the risk assessment over time at a particular PA then compare the results, to view the risk increase or decrease. Again, this is most helpful if tied to reflecting a particular scenario or investment e.g. decline of hunting skills or investment in anti-poaching units.

In summary, each of the aims of testing in multiple locations was satisfied, and the experience gained can be put to good use in future work of this type. However following experience in the PAs, a final thought is now considered regarding the approach to determining factors and their measures for inclusion in the model. There were many interesting findings during the fieldwork, but this discussion has been focussed on those most directly providing feedback for the existing framework and methodology. Let us stand back and reconsider.

Where additional information was uncovered, e.g. community programmes or poaching stories, it gave an insight into the world in which wild tigers live and may be at risk of being poached. This is relevant to determining factors/measures in the model, and for each story it provokes thought as to whether the current framework model can reflect the scenario in question and if so, how it manifests itself. The above case of potential best practice is an example of this: Outreach programmes are shown in the model through improved local awareness of the park and the tigers' plight. However another story given as additional information was that of the Great Hornbill opportunistically poached by killing his mother. The model is currently very focussed on poaching of tigers, whereas experience from the PAs showed that some hunting is just opportunistic, capturing any animal that happens to be found – does the model have an adequate way to reflect this? Not really, as it would be quite subtly reflected through a set of conditions: poor law enforcement meaning little deterrent from risk of penalty, big $ value but from a

potentially normally inactive trade route (e.g. one set up for other wildlife that happens to also process the occasional tiger). The positive work of Outreach programmes may have had no effect on the hunter, yet look positive in the model.

This is an interesting crosscheck to pursue in future development of the framework: thinking of scenarios in which tigers are poached and then looking at how that risk may have been spotted through this type of model. In this case, opportunistic hunting may not be a problem if the rate at which tigers are poached is low, but what if the park is full of opportunistic hunters, as in Khao Yai – their total effect has been devastating. Now that some good examples of risk scenarios have been identified from Thailand, the model could be revisited with a clearer understanding of how to be alerted to risk.

3.3.2 Implications and applications for the framework

Many of the detailed points regarding use of the framework have already been discussed previously. This section focuses on broader practicalities for the methodology, followed by the overall implications for the feasibility of designing a rapid risk assessment of the tiger poaching threat in PAs, given the experience gained throughout the project. This leads to whether there is value in pursuing this concept, and if so, how this should be done, and how it could be applied.

At a practical level, the most important implication from the testing phase was that the methodology did work with regard to collecting data to populate a risk assessment scorecard for tiger poaching, with some adaptations.

Two broader points are now worthy of discussion with regard to the methodology.

Firstly, the technique for data collection: the main technique chosen for data collection was through questionnaires with numerical answers, as this was felt

to provide standardisation. Although successful in this way, a lot of information was forthcoming in addition to the basic answers, in the form of both facts and stories relevant to poaching, as well as activities that may be important in prevention or at least deterring poaching in the future. This led to contemplation of whether the questionnaire approach was too limited. Other possible techniques that give more possibility for broad answers and follow-up questions are structured interviewing (used here in parts) or focus groups. However, looking back on the number and type of people who were surveyed, it is hard to see how such a wide range of specific input would have been secured through these techniques as, with certain target groups, many would have sat quietly in the corner whilst others dominated. This already happened when groups answered questionnaires in parallel, but on comparing the forms afterwards, the same answers were not always recorded, so it would appear that, privately, individual opinions were being given. Having considered the pros and cons of the various techniques, it was decided on balance that the combination of using questionnaires and room/time for additional information is the best approach to achieve the broadest range of input.

Secondly, the approach for data analysis: it was identified earlier that this stage of the testing phase was cumbersome and needed to be streamlined. Before doing that, the most appropriate technique for data collection needed to be confirmed, as there was no point investing time in automation if the decision was to use, for example, structured interviews, for which the data entry would be very different. Having reviewed the options for data collection and been satisfied that standardised questionnaires are still the best way, it is worth optimising the data entry for the analysis stage. This basically entails tailoring

data entry screens for entering the answers from individual questionnaires, then automating the mapping of those answers back to original risk framework. Options for the actual analysis are considered in *Chapter 4* below.

Revisiting the original concept, there are a few issues to be considered following the feasibility study, to examine if there is value in continuing. These are discussed below.

The original purpose was to design a rapid risk assessment tool, yet the necessary spread of factors leads to exploration of areas that are each complex in their own right. It can be difficult to find a balance between delving enough to make a true assessment and not getting lost or distracted by detail. This leads to two questions: can the assessment be rapid? should the assessment be rapid? These will be discussed in reverse order.

Should the assessment be rapid? The reason for wanting a rapid risk assessment tool was to enable a holistic view to be built across all Tiger Range States worldwide, with the purpose of using this to prepare a coordinated strategy for placing investment. There are many projects targeted at detailed areas of tiger conservation – the piece that seemed to be missing was a management tool to guide prioritisation. It is recognised that any rapid assessment approach provides only a preliminary rather than definitive result, but this is felt to be necessary to form a timely initial baseline from which to improve. If the individual risk assessments are too detailed, they will take too long, and then become a risk in themselves either by overly diverting much needed money or, more seriously, by wild tigers having been terminally lost to poaching in the meantime. It is therefore concluded that the assessment must be rapid to be of benefit, at least in the first instance to build the picture.

So given rapidity as a requirement, *can the assessment be rapid?* From experience gained in the field, it is possible for the actual assessment to be rapid, however it is noted that the speed improves exponentially as more PAs are studied in a particular Tiger Range State. There is a heavy start-up cost in

terms of preparation time spent to examine a new country and location, but using the structured approach identified in the framework and "tips & tricks" noted in the planned User Guide (see *Chapter 6. Recommendations for further work*), the assessment can be reasonably smoothly and rapidly made. There is a natural desire on the part of interviewees to fully represent 'their angle', and hence provide a lot of detail. There must be room for this, in order for relevant points to be extracted, but the focus must be kept in mind: addressing those factors that directly affect the threat of tiger poaching and assessing the risk for the location in question. The additional information then serves as a useful crosscheck in viewing how a particular scenario is reflected in the model, giving a useful feedback loop on whether the framework is complete and constructed appropriately.

The latter point leads to another important consideration: *is the tool too blunt to highlight risk?* The original intention was to use the model to highlight high and low risk, for example by reflecting gaps in knowledge (through higher risk) and identifying examples of best practice (through low risk). Experience has shown that these do not currently show clearly, one reason being that some questions are not tight enough (as discussed previously) and another reason being that results can be 'cancelled out' when summarised across stakeholders or rolled up to the overall Category level in the scorecard. An example of the latter is the Outreach programme at Huai Kha Khaeng Wildlife Sanctuary. This manifests itself in the scorecard through a number of factors, however if only one scorecard is produced for that PA, then those in the scheme cancel out those not in the scheme, and any progress made through the programme is not clear. This can be addressed by ensuring appropriate sampling, in this case a balance of stakeholders representing both sides, then analysing the scorecard separately for these two target groups, so the issue is not insurmountable, but it highlights the need for thorough and informed data analysis, not just adding everything up to provide an overall score, which can be very distracting. The overall score can of course still indicate total risk, but it hides the effects of positive and negative activities underneath. When reviewing the completed scorecard, as mentioned previously, additional information should be revisited

as it helps to give pointers on where to look in the model for areas of interest. Splitting some questions as well as probing with follow-up questions enables clearer exposure of a greater level of detail, for example if there is a difference in attitude to PA staff as opposed to NGO staff. Hence through this discussion, it is concluded that the tool is not too blunt if it is used intelligently.

It is important to note that the power is in the detailed analysis, and this is discussed further in the next chapter. During initial use of the scorecard approach, particularly when unexpected results occur, they must be examined to ascertain whether the result is valid, or a problem has been identified with the model. The factor may be right, but the measure may be wrong e.g. estimating tiger numbers, or the factor may be right but the connection to risk may be wrong, e.g. what level of risk to derive from recording a healthy population of tigers (both these examples were discussed in the previous section).

Overall, it is definitely considered valuable to stimulate discussion and provide a holistic view of tiger poaching, and the framework suggests a structure for such an investigation, be it followed through structured interviews or questionnaires. As well as sharing knowledge, the holistic approach is particularly important as so many aspects of tiger poaching are interlinked. Prioritisation of international and national resources is key, particularly when time is running out for some Tiger Range States. It was found that some tiger populations are not even publicised, for fear of attracting poachers, but this should not mean they fall outside the vision of those trying to help conserve them – this would put them at even greater risk. Establishing a baseline then reviewing overall progress over time is also important, and to do this, standardised success indicators are needed: the framework provides a good tool for on-going monitoring, as the same process used for the baseline can be repeated at intervals at the same PAs and results compared.

Looking to the future, in order for the concept to be adopted by the tiger conservation community, it must first be refined, based on the experiences of

the fieldwork, then discussed and promoted to those who may be in a position to use it. A good starting point would be those involved in the testing phase, for example, NGOs and relevant PA or government staff in the TRS. A different promotion pack would need to be prepared for those who may run a scorecard exercise versus those who would be involved in reviewing the results. During fieldwork, notes were taken in preparation for both these audiences, and formalising these is identified as a task in *Chapter 6. Recommendations for further work*, together with other suggestions for next steps.

Finally, it is important to describe some applications for the framework, though there are many possibilities. Some of these have been mentioned previously, others are additional. The following list draws them together with a brief outline.

At a tactical level:

- On a single PA basis, populating a scorecard can be used to provide a baseline risk assessment, and then be repeated over time to provide ongoing monitoring of the status. The initial measures for the factors turn into success indicators to be used to show progress.
- Comparisons of PAs can be made, for example to highlight gaps in knowledge or identify best practice that can be shared.

At a strategic level:

- Comparisons of Tiger Range States can be made, for example to highlight different approaches to tiger management, for example the use of 'tiger tourism'.
- Prioritisation of investment options can be reviewed, for example to target the high-risk areas. There is currently a mismatch in Huai Kha Khaeng, whereby good tiger habitat has been identified as a priority for conservation, but tigers within it are not being actively protected. This framework could be used to expose this mismatch.
- Comparisons of the likely impact of different investment options can be made, through identifying the range of factors affected and applying a

sensitivity analysis (described in more detail in the next chapter).

- Once a large enough collection of scorecards is available, these can contribute to setting the strategy for tiger conservation, with the threat of tiger poaching being viewed alongside habitat loss and prey depletion.

3.4 Summary and conclusions of the testing phase

The objectives of the testing phase were:

- to test the hypothesis that such a model can be defined
- to gain experience of the issues and practicalities of implementing this risk assessment model
- to gain some preliminary results for two or more locations that could be compared and contrasted.

Overall, the testing phase proved successful in meeting its objectives. The hypothesis was tested by putting the methodology from the definition phase into practice in a pilot Tiger Range State - Thailand. Through fieldwork in three Protected Areas, preliminary results were obtained as well as useful experience of the issues and practicalities of performing this type of risk assessment.

Summarising the key activities and outcomes from the testing phase:

- In Thailand, meetings were held with relevant government contacts at the Royal Forest Dept (RFD) and relevant NGOs and research institutions - WCS, WildAid and World Wildlife Fund (WWF) Thailand

- Contact was also made with two lawyers familiar with wildlife legislation and the Wildlife Fund of Thailand (WFT), a local NGO with an interest but no active tiger programmes at that time

- Three PAs were selected from discussion with local experts: Khao Yai and Kaeng Krachan National Parks and Huai Kha Khaeng Wildlife Sanctuary

- Together with central research, surveying in and around the PAs resulted in

253 completed questionnaires (including 24 Fact Sheets) from the following target groups:

  - Lawyers
  - Government officials (Wildlife Protection and Natural Resources Divs.)
  - NGOs (funding & implementing agencies)
  - PA management, office staff and rangers
  - Local communities including some poachers
  - Tourists (foreign & local) and tour companies/group leaders

- Preliminary results were collated on summary prototype scorecards for each of the three Protected Areas then basic analysis was applied.

The main conclusions are described below, firstly with respect to the risk assessment framework and secondly regarding preliminary results from Thailand.

a. <u>Conclusions pertaining to the framework</u>

At a practical level, the most important conclusion from the testing phase was that the methodology did work with respect to collecting data to populate a risk assessment scorecard for tiger poaching. Some adaptations had to be made along the way, but the approach was successfully applied at many levels, collecting information for a Tiger Range State as well as at a Protected Area level, across a wide range of stakeholders. The main issues that arose were regarding streamlining the process and facilitating data collection, and these were reasonably easily addressed.

Some points to note for data collection in the future were:

- anticipation of target groups, such that representative sample populations and associated questionnaires could be designed accordingly, with the aim of being as intuitive as possible. Interviews and surveys should be concise, without missing opportunities for useful additional information.

- clarification and tightening of some questions, to ensure that there are no misinterpretations, as discussed in the previous sections.
- redesign of some questions. Firstly, testing showed that the initial supposition that it was easier to collect opinion than fact did not turn out to be true in all cases - it can be easier and, more importantly, far more reliable to collect fact than opinion in some cases where this is appropriate i.e. when facts are available. Secondly, some of the factors need to be rethought in terms of their indication of risk.

Other key conclusions were:

- Language is and usually will be a problem during tiger related fieldwork - translation is necessary but can be approached a number of different ways with varying costs and benefits.
- Time must be incorporated to 'train' the translator – go through the questionnaires, confirm the emphasis, prepare a suitable introduction for those who need to know more about the work e.g. PA Superintendents, versus those respondents who just want 'to get on with it'. This investment of time, together with facilitating the survey sessions, really helps to improve data quality on the questionnaire responses.
- Following data collection, further thinking is required regarding analysis. There are a number of ways to analyse the data and some basic analysis was done as 'proof of concept', but this needs to be explored more fully to produce a data analysis tool to accurately reflect risk in a standardised way.

The last key point is that the additional information gathered during fieldwork provides a useful way to 'dry run' the model as a test of its accuracy in predicting risk. This would be done by examining how the poaching scenarios would be manifested through the framework and whether they would be successfully highlighted as a high risk. More thought on this is required and is recommended as a next step for future work in *Chapter 6. Recommendations for further work.*

So overall, following testing, there is value in the concept but it needs refining, with an eye on how to capture best practice and expose gaps most effectively. As a methodology, it works at a practical level with regard to data collection, with some suggestions for improvement.

b. Conclusions pertaining to Thailand

The main purpose of the testing phase was to test the feasibility of the concept and methodology, by piloting in a TRS. Consequently, the preliminary findings and results for Thailand should be viewed with some caution as their quality may have been affected by the immaturity of the process. Having said that, some general conclusions can be drawn with reasonable confidence, but are kept brief so as not to distract from the core theme of testing the risk assessment methodology:

- There is good law coverage but very patchy enforcement.
- The management for the PAs is operated strictly hierarchically, from central RFD control to the Superintendent controlling the PA itself. Formalities matter – it is important to spend time with appropriate government staff and secure the necessary permissions, as this makes subsequent fieldwork at the PAs far easier.
- National Parks are set up as a 'nature setting', not as a formalised protection and research programme towards biodiversity conservation.
- Tiger knowledge is very limited at the ranger level, with tigers surviving in spite of not because of protection.
- There has been some very good work with the local communities, but this is patchy and down to NGOs rather than a government programme.
- Tiger poaching is proactive not the result of threat to humans or livestock.
- There is no tiger specific tourism, and revenue generation from tourism is sub optimal. PA Management are missing a trick with education opportunities in Visitors Centres, particularly with Kaeng Krachan and Huai Kha Khaeng.

3.5 Recommendations from the testing phase

The following recommendations have been split into those pertaining to the concept and methodology, and those relevant to Thailand. The latter have been kept very brief as the focus is testing the model not evaluating Thailand itself.

Recommendations from testing the methodology are as follows.

- Collate the findings regarding streamlining the process into a "User Guide" for future risk assessments. These findings include those from the fieldwork and those from the subsequent data analysis process.
- Refine the content of the questionnaires before the model is used again, with respect to making it intuitive and ensuring each factor can be clearly evaluated as an indicator of risk.
- Build on the good relationships established during the pilot studies, to re-run the assessment as an ongoing monitoring tool.
- Now that it has been seen to work (with improvements), prepare a "Communication Pack" to introduce the concept to potential operators and reviewers of the tool.

For future assessments:

- Always build plenty of time into the schedule. For a new Tiger Range State, the first trip should allow extra time at the beginning to understand how everything works and to make the right connections.
- Be sure to recruit a good translator if English is not widely spoken where the surveying will take place.
- Ensure preparation time with the translator, then make good use of them: facilitating the survey sessions, checking data quality, translating additional information from the local language and pursuing follow up questions as opportunities arise.
- Anticipate target groups of stakeholders and design your sample populations and associated questionnaires accordingly.

Regarding recommendations pertaining to Thailand, four points have been picked out to give a flavour of the type of recommendations enabled by observation in this pilot study. The four high level recommendations are:

- Reapply best practice examples, such as the Watchdog scheme where villagers act as 'eyes & ears' on poaching activities in their local communities.
- Tighten law enforcement and publicise this effort, such that the threat of punishment becomes a real deterrent.
- Consider models for improved revenue generation from tourism, and use the extra money as a positive force for conservation of biodiversity:
    - restructure where money goes, away from private business and into the Protected Area, or least a better balance
    - couple this with better facilities to support education in the PAs, such as field guides and improved Visitors Centres
- If Thailand really wants to keep its wild tigers, then initiate some research and protection as a priority, including urgent ranger training.

CHAPTER 4. FURTHER DATA ANALYSIS

4.1 Options for Analysis

Only basic data analysis was performed to provide preliminary results in **Figs. 5**, **7** and **9** for discussion in the previous sections. It was necessary to use a measure of central tendency to give an overall evaluation, as multiple answers were collated from the questionnaires for each risk factor in the scorecard. 'Summing' was not appropriate as there was variance in the sample numbers across different target groups of stakeholders, so it was decided to use the median, as it is not affected by outliers unlike the mean (N.B. the mode could also have been used). The data analysis functions used were Excel's MEDIAN and AVERAGE (arithmetic mean): the median was used across the responses for a particular factor, then the average was used when 'rolling up' to calculate the derived 'parent' value of the nested levels of medians (see *Section 4.2 Weighting and Sensitivity Analysis* below).

Even at a basic level, there are clearly other ways in which the data could have been analysed and this should be explored more fully as a next step to this project. An example is the use of measures of variability, for example on closer inspection of the range and distribution of answers for each factor, finding a very mixed response right across ***1-5*** may indicate that the question needs clarifying or refining. Alternatively, another measure of spread that is not influenced by outliers is the interquartile range. Having already calculated the median, this would be useful to review to look at trends in the distribution of the answers e.g. perhaps there is a difference based on the perspective of different stakeholders.

Alternatively, or in addition to some of the previous techniques, a completely different approach that could be usefully applied is that of sensitivity analysis, described below.

4.2 Weighting and sensitivity analysis

Following early discussion, it was decided that there should be no implicit weighting built into the model, i.e. all categories of factors would be considered of equal importance in the first instance. It should be noted however that in order to maintain a balance of level, some factors were nested with the top value being derived from those below. Where this has been done, it has been clearly marked as such using indentation for the component factors. An example of this nesting within *PA Staff* was to set *Number of staff* (derived as a function of staff balance across different roles, terrain type etc.) at the same level as *Staff Motivation (*derived as a function of salary, training, equipment etc.), see **Fig. 11** below, taken from **Appendix A** – *Detailed Framework*. Derived values of this type are marked in red in the framework.

Figure 11. Example of nested factors

Number of staff
No. of staff across functions
Staff make-up
Local recruitment
Staff rotation
Terrain type
Popularity
Staff motivation
Pay
Training
Equipment
Individual attitude
Incentive schemes

Once all the data has been collected for a PA, sensitivity analysis can be performed by varying the weighting of different inputs to show how placing emphasis on a particular area will influence the result. Weighting can be applied to one or more inputs at a time, as it is recognised that factors are often inter-related and it may be unrealistic to treat them independently.

Inputs of any type may be weighted, such as at the category level, at the factor level or at the stakeholder level, for example in the latter case by doubling the scores of primary data owners versus secondary.

The purpose of a sensitivity analysis is to show the outcome of placing emphasis in one input to the model versus another. A key benefit of this can be to demonstrate both the positive and potentially negative effects of placing investment in a particular area. An example of this may be to focus on enforcement of existing legislation without investment in a local community outreach scheme, such that no support is provided to those whose spouses may be incarcerated, either during or following their prison sentence. An alternative form of investment project could tackle these in combination, by improving enforcement as well as working with the local community to identify alternative employment to poaching, thereby averting the problem or at least providing some method of income for the spouse whilst a penalty is enforced. This could have a positive impact on both the financial situation and the attitude of hunting families towards the authorities.

A simple worked example for applying sensitivity analysis is described below to demonstrate the approach, followed by a brief discussion of the choice of input to vary.

4.3 Sensitivity analysis: a worked example

In this example, suppose there is one lump of money to invest in our *PA Staff.* We would like to predict the potential impact of the investment on the overall risk for the *PA MANAGEMENT* category by:

a) Spending money to recruit more staff, thereby having more staff who are equally happy/unhappy

or

b) Spending money on improving conditions for our existing staff, so that there are the same number of staff, but they feel more motivated.

Whichever best improves the return on investment will receive the money.

To investigate how the risk is affected, we will say that investing the money in either case would improve the person's future response by, for example, a factor of 2. As it is an investment, it should therefore lower the risk, so this translates to multiplying each of the responses by 0.5 in the nested factors of firstly scenario a) *Number of staff,* then secondly scenario b) *Staff motivation.*

Taking Khao Yai as the example, the risk score of *PA MANAGEMENT* is ***2.54*** before any weighting is applied. **Table 9** shows the effects of weighting the first then the second scenario.

Table 9. Impact on PA MANAGEMENT of weighting different sub factors in turn

	PA MANAGEMENT
No weighting	2.54
a) Weighting *Number of staff* by x 0.5	2.31
b) Weighting *Staff motivation* by x 0.5	2.21

With these two scenarios, the risk is improved more through investment in the second, as ***2.21*** is a lower risk than ***2.31***. This therefore shows that in the case of this simple example, it would be better to invest in motivating the existing staff than recruiting more.

Similarly, a calculation on a second example in the *PA MANAGEMENT* category to investigate a choice of investing in a) *PA Staff* generally as opposed to b) *Communication*, showed the following result in **Table 10.** The investment in PA Staff should therefore be chosen as a better return on investment.

Table 10. Impact on PA MANAGEMENT of weighting different sub factors in turn

	PA MANAGEMENT
No weighting	2.54
a) Weighting *PA staff* by x 0.5	1.73
b) Weighting *Communication* by x 0.5	2.08

Obviously, these are very simple examples, but they are just intended to demonstrate the technique. In reality, many factors are interlinked when any particular scenario is chosen, and the challenge is to untangle those connections and make the appropriate weightings. The choices of which variable(s) to weight is discussed in the next section.

4.4 Choosing which variables to weight

As mentioned previously, a variety of inputs could be weighted depending on the desired prediction. The most important consideration is the intended purpose, and this will guide which inputs to weight in order to demonstrate the effects of the proposed actions. Two examples are as follows. If the *POLICY AND LEGISLATION* of the TRS are suspected to be the most important risk category, then this whole category could be weighted. If the actions of the local community have been identified as high risk regarding the threat of poaching, then this could be examined as a combination of weighting the *LOCAL COMMUNITY* and *MARKET FOR TIGER PARTS* categories.

Given that any one or more inputs can be weighted, a suggested approach for determining which to select is as follows:

Step 1. Review the framework results for the PA. Note that it is sensible to choose an input that appears to show higher risk of poaching as the target for investment, although this is obviously a tactical risk management approach and in reality a strategic view may prioritise differently.

Step 2. Decide which are the important factors that would be directly linked to that investment.

The outcomes of these steps should determine the choice of inputs to weight in any particular scenario. It is then necessary to decide what weighting to give to show the required emphasis, based on appropriate logic, for example the potential proportion of investment or perceived size of problem.

Further examples of reasons for examining important areas for which weighting could be usefully applied are:

At the Category level :

- auditing then monitoring the *FUNDING AND GOVERNANCE* of PAs in a particular TRS, in order to ensure transparency of investment and management performance against objectives. This can provide a holistic view of the funding spread and can be used to identify areas for improvement or issues for resolution between investors and those with fiscal management responsibilities.
- investing in *TOURISM* based on tiger presence. This may be desired if best practice examples in other Tiger Range States, such as India or Nepal, have been identified through the framework as showing a reduced risk of poaching.

At the Factor level:

- demonstrating the effect of investment in areas of Outreach programmes for the local community, for example if the focus is to be on local community participation then the current status and potential progress could be manifested through the *Involvement in tiger management*. Similarly, if tigers are deemed a threat, then this aspect can be studied through *Attitude to tigers*.
- examining the likely accuracy of the process for *Estimation of tiger numbers* and its regularity in a PA; if the methods have a high level of inaccuracy or are only performed infrequently then the risk will be increased as it is hard to note poaching incidents if there is only poor knowledge of the tiger numbers and distribution in the first place.

At the Stakeholder input level:

- recognising that *Rangers or anti-poaching patrols* are critical to the protection of wild tigers in situ. The importance of their views can be

highlighted by weighting their input over that of other stakeholders, which will affect their contribution to certain factors across the framework.

- a general way to look at the effects of stakeholder influence could be achieved by weighting the input of primary data owners versus secondary. Primary data owners are various target groups of stakeholders who are considered to be the main source of a particular piece of information. An example is to ask PA staff if they consider their salary to be good. They are the primary data owners, but asking NGOs or the PA management if they believe PA staff are happy with their salary would be secondary data owners, treated as one way of 'cross-checking' the answer. Note there may be multiple primary data owners in some cases, e.g. hunters may know if there are poaching 'hot-spots' within a PA, but equally validly so may anti-poaching patrols who monitor the PA on a regular basis.

It is therefore fundamental to the validity of the outcome that the choice of variable and level of weighting applied are carefully identified against the desired scenario.

As noted above, the analysis needs further exploration following on from this project.

4.5 Summary and Conclusion of Data Analysis

The purpose of this chapter was to summarise how the data analysis had been done to date, introduce other options such as the technique of sensitivity analysis with its possibilities for application within this type of framework, and lastly to acknowledge that a lot more work is required to leverage benefit from any of these. As this framework is a powerful tool and can be applied at many levels, it was not possible or intended that there be exhaustive analysis as part of this project - the principles have been demonstrated for future application. This was also appropriate as the results for Thailand, used in the previous

worked examples, were notably from a test run of the framework so must be approached with caution, bearing in mind that the model was still being refined.

A recommendation is therefore included to state that the analysis must be properly explored before the model is used in new locations (see *Chapter 6. Recommendations for further work*).

CHAPTER 5. SUMMARY AND CONCLUSIONS

The overall aim of the project was to determine the feasibility of using a rapid risk assessment methodology for assessing poaching threats to tigers in Protected Areas. This was to be done by defining a prototype framework in the form of a scorecard to evaluate relevant factors, then by testing this scorecard in a pilot Tiger Range State. The findings and results from the test phase would be used to show the implications and applications for the framework, and lead to recommendations on the next steps for such a concept.

To draw an overall conclusion for this feasibility study, the question should be framed in three parts:

- whether it was possible to define a methodology and prototype framework to enable a rapid risk assessment?
- whether it was possible to implement the rapid risk assessment using the prototype framework?
- whether any useful results could be obtained from such an assessment?

A brief summary of the project activities and outputs follows, with specific conclusions drawn for each of these questions, in order to arrive at an overall judgement of the feasibility.

The definition of a prototype framework was achieved through literature research and seeking feedback from appropriate experts in the conservation field. The resulting framework was subdivided into categories, such as *POLICY AND LEGISLATION,* each containing individual factors, such as *Law enforcement*. The categories and factors selected were those deemed to most directly affect the threat of tiger poaching. Each factor was described together with a standardised measure to assess the level of risk. Following discussion during the expert review stage, Thailand was selected as the pilot TRS, as it was important that the pilot study be conducted in a country with some formal infrastructure in place for managing PAs, in order for the indicators in the scorecard to be successfully evaluated. Within Thailand, the research was

conducted in three PAs: Khao Yai National Park (the kingdom's 'flagship' park), then Kaeng Krachan National Park and Huai Kha Khaeng Wildlife Sanctuary (two areas that still have good tiger populations). Preliminary results were collated for each site, and basic data analysis performed. The experiences from these locations were compared and contrasted, and the resulting implications and applications for the framework explored.

As this was a feasibility study, only basic data analysis was conducted to derive some quick results. Further options for analysis have been briefly outlined, for example a sensitivity analysis where different factors within the model can be weighted to demonstrate varying impact. A lot more can be done to explore the power of this type of rapid risk assessment through more detailed analysis, and suggestions have been noted in *Chapter 6. Recommendations for further work*.

Was it possible to define a methodology and prototype framework to enable a rapid risk assessment?

Conclusion: It was possible to define such a framework using the technique of a risk assessment grid of the type utilised in Environmental Impact Assessments, and populating the criteria with the range of factors deemed most likely to impact the threat of poaching. Adding standardised measures produced a scorecard that could be evaluated for each PA. The challenges in this task were firstly to ensure that the chosen categories and factors were the right indicators to make an appropriate assessment of this risk, and secondly that these would provide a complete enough overview, given the complexity of so many of the factors and balanced against the original desire for the assessment to be rapid.

Review of the concept and methodology showed basic support for the approach, but with frequent observation that it was very broad and hence may prove difficult to collect data. Another comment made was that tiger threats differ on a case-by-case basis, and it may not be possible to generalise for

evaluation in this way. This was useful feedback: the first point helped in tailoring the approach and content of the testing phase to avoid getting lost in detail. The conclusion regarding the second point, having tested the methodology in the field, was that it is possible to generalise then evaluate each PA and compare the results. Any unique circumstances were captured through the additional information gained from discussion stimulated by and structured around the framework, so that the findings were complementary, rather than negating the use of such a framework.

Expert review of the framework also highlighted that everyone had their own 'angle', and wanted to see the model adapted to reflect that more clearly. The point of the model is to take a holistic view, so it is vital that the categories cover all key factors likely to affect the threat. The methodology showed that desired emphasis could be addressed via sensitivity analysis, without losing the overall perspective.

Was it possible to implement the rapid risk assessment using the prototype framework?

Conclusion: The testing phase showed that it was possible to carry out a rapid risk assessment using this methodology. The framework was used to design standardised questionnaires to collect data consistently and the results were collated to populate the scorecard. A number of key conclusions were noted during the testing phase, as follows.

Preparation before fieldwork is essential, with plenty of extra time also built in to the schedule to allow for flexibility based on local conditions – things will never occur as anticipated at a research location, but contingency planning will help to take the most advantage of whatever presents itself upon arrival. An example of this is to make contact with the government and relevant conservation organisations before the trip, and then be prepared for all plans to change once you meet face to face. Another example is trying to anticipate all

possible target groups who may be available for surveying and be as flexible as possible regarding logistical arrangements.

'Understanding your audience' was found to be fundamental to the success of data collection, and the situations encountered during the pilot study provided an excellent insight into how to optimise the current framework to improve data quality and completeness.

Language was found to be a potential barrier, and given the remoteness of wild tigers in other countries, that is likely to be the case elsewhere. Having tried several different approaches with translators, the best solution was found to be surveying people simultaneously, with the interviewer and translator facilitating the group's proceedings, as opposed to translating questionnaires that were then completed out of sight. It was crucial for the translator to have a good enough grasp of English to hold a swift conversation, in case an opportunity arose for additional follow-up questions.

During the fieldwork a number of detailed refinements were identified that must be addressed before the framework is used again in another location. These pertained to the content of the model and questionnaires, as well as optimising the methodology based on logistical practicalities.

Overall, as long as the researcher is adaptable and well prepared, operating the rapid risk assessment is not difficult. The valuable points noted for streamlining the implementation process are intended for inclusion in a "User Guide" to be used by people conducting a similar exercise in a new PA or TRS. Creation of this User Guide is included in the recommendations.

Could any useful results be obtained from such an assessment?

Conclusion: Useful results <u>can be obtained</u> from this type of assessment, indeed even through the pilot study, some examples of best practice (local

community participation) were identified that manifested themselves through lower risk values.

As mentioned above, only basic data analysis was done, so the full potential of the tool is still to be exploited. However, it could already be seen that the framework enables a better view of linkages between factors, and this will be useful when explored more fully through sensitivity analysis. Notably this type of analysis can be applied in many ways e.g. at the factor level, or at the stakeholder level, to demonstrate how the importance of a particular aspect can affect the outcome. An example of the use of this is to view the significance or overall impact of one type of investment over another e.g. legislation enforcement versus community education programmes. Clearly variables can be weighted in combination, as factors are often inter-related.

In principle the model can be used to compare and contrast TRSs or PAs - one concern that arose was whether the prototype tool was too blunt to highlight points, such as the effects of Outreach programmes running with the local communities. This problem can arise when target groups inside and outside the programme are both surveyed, and their input 'cancels each other out' i.e. a positive + a negative opinion = an average risk. However this can be addressed by good sample design, and by analysing the results separately for the two types of target groups, so that a comparison can still be drawn within the PA. However until the number of people in the programme becomes the majority, it is fair that the overall risk is reflected as average.

Valuable information was given in addition to completing the questionnaires, and this is a good place to start when reviewing the risk profile for a PA. It can be used to crosscheck the results, but also to provide background explanations for some of the evaluations. The framework provides the structure, but the additional information ensures the 'human element' does not get lost, and is a key part of the findings to discuss along with the scorecard results.

In summary, the answer to all three parts of the question was affirmative, recognising that there are many improvements still to be made before the framework is ready for final use. This is the first time that a rapid risk assessment approach has been applied in this way, i.e. to take a holistic view of all the key factors that are likely to affect the threat of tiger poaching. Testing the concept has shown that there is merit in this approach, though refinement is needed to realise the potential. The overall conclusion is therefore that it is feasible to use such a rapid risk assessment technique to evaluate the comparative threats of tiger poaching. A prototype is now available, and recommendations for the next steps are detailed in the next chapter.

CHAPTER 6. RECOMMENDATIONS FOR FURTHER WORK

This framework concept touches on many complex areas, and as this was a feasibility study, it has only scratched the surface. As the conclusion of this project is that there is value in pursuing the idea, some recommendations for further work have been identified. These have been split into four areas:

- refining and developing the model – tasks that should be addressed before the framework is used as a risk assessment in a new location
- recommendations for where the framework could next be used
- next steps towards the framework becoming recognised and embedded as a management tool
- further applications for the model

Refining and developing the model before further use

Implement the improvements identified during this feasibility project. This includes

- refining some factors and/or aspects of the questionnaires for clarity
- rethinking and revising some factors, their measures in relation to risk, and the associated questions in the questionnaires for improved accuracy
- developing some factors and/or questions to enhance the information received for improved coverage.

Review or dry run the framework with regard to poaching scenarios identified from fieldwork to determine how these would manifest themselves in the model. The tool should be robust, and able to reflect true risk, not just theoretical risk, so it is important that this reality check be done. The tool should either be revised in light of the outcomes from this, or explanatory notes added for enhanced analysis, so threats are not inadvertently missed.

Perform a thorough analysis of the test results, in order to be able to

- highlight any issues with clarity in the model
- demonstrate the range of possibilities when promoting the tool.

The analysis should include a wider range of basic statistics functions, such as analysing the stakeholder input using the median and interquartile range for each factor to explore the distribution of views, as well as choosing some investment scenarios to compare using sensitivity analysis to identify maximum return on investment.

Formalise notes made during the feasibility study regarding streamlining the process into a "User Guide for future use" when repeating this exercise in other locations. The notes include a "Hints & Tips" section for capturing small points that can make a big difference in facilitating the assessment e.g. park restaurants are useful places for surveying when talking to rangers and tourists, rather than trying to catch them one by one when they are busy.

Streamline and automate the data entry and analysis as far as possible. This will optimise the process, both from a speed point of view, but also from a data quality perspective, as there will be less room for human error.

Initiate a "Knowledge Base" about tiger poaching by collating key findings from this fieldwork, for example

- Findings per location with regard to the nature of poaching, to dispel myths that the majority or tigers are killed because they posed a threat to villagers or their livestock
- Poaching scenarios: methods, motives, deterrents etc.
- A 'best practice' list, starting with the excellent Watchdog scheme around Huai Kha Khaeng WS.

<u>Recommendations for where the framework should next be used</u>

Once the model has been refined and developed to incorporate learnings from the pilot study, it should be used to *evaluate risk in more Protected Areas across more Tiger Range States*. As the pool of information increases, it becomes easier to visualise the overall picture, to realise the observations and examinations that can be made and the conclusions that may be drawn once

more data is available. Relevant perspectives for each audience can also be explored to catch people's interest.

Repeat the assessment in the test Protected Areas after an appropriate interval to monitor progress.

Consider *using the framework at a Tiger Conservation Unit level*, as this is the level at which some core tiger conservation groups are planning. Evaluating at the TCU level would integrate the TCU habitat prioritisation exercise with current risk assessment for tiger poaching, which makes a great deal of sense.

Promoting and embedding the framework as a management tool

Prepare a communication pack to promote the tool, with the following elements:

- Overview of the concept and potential benefits
- Summary of the test results, conclusions and recommendations
- Demonstration of the power and use of the tool using the example results, and a range of analysis techniques
- Outline of benefits to those involved in managing tiger conservation e.g. the tiger experts in the IUCN Cat Specialist Group
- Outline of benefits to those implementing tiger conservation, or those PA staff with wild tigers in their midst who currently have no conservation activity in place

Identify members of the two audiences (management and implementers) and make contact to *promote and demonstrate the tool*.

Further applications for the model

This risk assessment tool can be *used for other species*. For example, the risk could easily be evaluated for other large mammals that share the tiger's habitat and similar threats, such as Asian elephants poached for their ivory; many of

the scorecard results can be re-used, as the legislation backdrop and local community programmes, for example, will be the same around a particular PA.

Note that if prey loss through poaching is a significant threat to the viability of the tiger population, then the framework could be used to analyse and assess the prey market - another example of applying the framework to other species.

Consider the possibility of a 'risk scale', placing Tiger Range States along a scale according to their risk profile.

In summary as outlined above, there are plenty of ways to build on the work initiated in this project, and it is sincerely hoped that this tool will be adopted and developed to enable the benefits envisioned. The tiger is a "sleek, stealthy, powerful, and beautiful" animal (Nichols et al, 1998) and its presence is an important indicator of the health of that ecosystem. Let us hope that it is allowed to continue to perform this role.

Courtesy of WWF Thailand

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GLOSSARY

BFF	Born Free Foundation
BPP	Border Patrol Police
CITES	Convention on International Trade in Endangered Species
DSWF	David Shepherd Wildlife Foundation
EIA	Environmental Investigation Agency
GTPD	Global Tiger Projects Database
KY	Khao Yai
KYCP	Khao Yai Conservation Programme
MOE	Ministry of Education
NGO	Non Governmental Organisation
NP	National Park
PA	Protected Area
RFD	Royal Forest Department
SEET	Strengthening Environmental Education in Thailand
TCM	Traditional Chinese Medicine
TCU	Tiger Conservation Unit
TRS	Tiger Range State
WCS	Wildlife Conservation Society
WEFCOM	Western Forest Complex
WFC	Western Forest Complex (used by WWF)
WFT	Wildlife Fund for Thailand
WS	Wildlife Sanctuary
WWF	World Wildlife Fund
WWFN	Worldwide Fund for Nature
ZSL	Zoological Society of London

APPENDICES

Appendix A – Detailed Framework

PROTOTYPE

Detailed Framework

Factors indicating level of risk for poaching of tigers in National Parks, Reserves and Wildlife Sanctuaries

Category of factors	Level applied	Description and measures (scales of 1-5)	List of values
1. POLICY AND LEGISLATION	National	Policy and legislation provide the context in which tiger conservation and poaching activities are set. (N.B. policy seeks to deliver more than legislation, policy commitments can be met through other mechanisms e.g. funding programmes/functions in Cat. 2). Provision of policy focus, tight legislation and good enforcement will certainly contribute to reducing poaching threat.	
a. Relevant laws/International Treaties		*Assessment of presence and coverage of relevant laws to support international treaties e.g. CITES, CBD. Having identified which laws and international agreements have jurisdiction in this PA, how adequate is the protection?* *Scale of **1** (adequate protection) to **5** (insufficient protection)*	***1 2 3 4 5***
b. Law Enforcement		*Assessment of implementation and effectiveness: from recent history, how well is legislation enforced? Derived as a function of resources e.g. staff and funding, success rate of prosecutions following intelligence and suitability of penalties.* ***1** (effective enforcement) to **5** (little or no enforcement)*	***Derived value***
Resources		Resources to enforce legislation (compared with other areas e.g. drugs?). Derived as a function of staff numbers, funding. **1** (adequate) to **5** (insufficient)	Derived value
No of dedicated staff		Number of staff dedicated to enforce legislation (compared with other areas e.g. drugs?). **1** (adequate) to **5** (insufficient)	1 2 3 4 5
Funding		Funding to enforce legislation (compared with other areas e.g. drugs?). **1** (adequate) to **5** (insufficient)	1 2 3 4 5
Seizures and prosecution		Is intelligence being converted to successful prosecution? e.g. number of suspected cases of poaching versus action taken. **1** (seizures leading to prosecution) to **5** (intelligence not acted upon)	1 2 3 4 5
Penalties		Do the penalties fit severity of crime, therefore acting as a deterrent? **1** (effective deterrent) to **5** (little or no deterrent)	1 2 3 4 5
2. FUNDING AND GOVERNANCE	For PA	Is there clear understanding of who provides funding for the PA and is there clear accountability and responsibility for managing investment? Tight management and monitoring is likely to expose risk.	
a. Accountability and Reporting		*Is there a clear line of governance above the PA? Derived as a function of roles and responsibilities and reporting requirements.* ***1** (defined and documented) to **5** (not defined)*	***Derived value***
Roles and responsibilities		Are the roles and responsibilities defined for governance? **1** (defined and documented) to **5** (not defined)	1 2 3 4 5
Reporting requirements		Are the reporting requirements laid out for all funding providers? **1** (defined and documented) to **5** (not defined)	1 2 3 4 5
b. Funding		*Analysis of source and reliability of funding for the PA, its staff and programmes. Derived as a function of funding availability, breakdown, reliability and opportunity for direct benefit of successful operation through reinvestment.* ***1** (well managed) to **5** (little or no information available)*	***Derived value***
Funding availability		Is the funding sufficient for the strategies and programmes in place in the view of implementing agencies? **1** (considered adequate) to **5** (insufficient)	1 2 3 4 5
Funding breakdown		Is there funding breakdown: e.g. central/regional/local government, conservation groups/programmes, consumer countries? **1** (clearly defined and documented) to **5** (not defined)	1 2 3 4 5
Reliability		Do PA budgets reliably receive promised funding? **1** (usually) to **5** (rarely)	1 2 3 4 5
Re-investment of PA revenue		Are PA fees, tour/hotel co.charges and visitor centre profits reinvested in the PA providing direct benefit of successful operation? **1** (reinvested) to **5** (paid to government, with no clear reinvestment)	1 2 3 4 5

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PROTOTYPE

Detailed Framework *continued*

Factors indicating level of risk for poaching of tigers in National Parks, Reserves and Wildlife Sanctuaries

Category of factors *continued*	Level applied	Description and measures (scales of 1-5)	List of values
3. PA MANAGEMENT	WithinPA	Is the PA being managed to best effect? A well run PA with motivated staff will provide a more protected environment for tigers, and tight management will expose risks and opportunities.	
a. PA Staff		*Assessment of PA staff, derived as a function of roles & responsibilities, number & balance of staff and their motivation.* ***1** (good workforce) to **5** (urgent attention required)*	***Derived value***
Roles and responsibilities		Are these clearly defined and documented? **1** (clearly defined and documented) to **5** (not defined)	1 2 3 4 5
Number of staff		Number of staff will be derived as a function of staff balance, make-up, PA size, terrain type (below), popularity **1** (adequate) to **5** (insufficient)	Derived value
No. of staff across functions		Number of staff available: admin, management, rangers **1** (good proportions) to **5** (insufficient/incorrect balance)	1 2 3 4 5
Staff make-up		What is the make-up of staff in the PA? Derived as a function to show local recruitment and staff rotation opportunities **1** (good proportions) to **5** (insufficient/incorrect balance)	Derived value
Local recruitment		Is there a mix of staff recruited locally, as well as expertise from outisde the area? **1** (local recruitment policy) to **5** (no opportunity)	1 2 3 4 5
Staff rotation		Do a proportion of the staff rotate round other PAs to gain/share expertise? **1** (rotation policy) to **5** (no opportunity)	1 2 3 4 5
Terrain type		Recorded in terms of overall ease of patrolling? **1** (easy) to **5** (hard)	1 2 3 4 5
Popularity		Is the PA frequently visited by tourists/other groups e.g. school parties, compared with averages visiting other local attractions **1** (above average) to **5** (below average)	1 2 3 4 5
Staff motivation		Staff motivation will be derived as a function of pay, training, equipment, individual attitude, incentives **1** (highly motivated) to **5** (poorly motivated)	Derived value
Pay		Is the pay considered a good package by the staff? **1** (good) to **5** (inadequate)	1 2 3 4 5
Training		Is the training available to perform role, and considered good by the staff? **1** (good) to **5** (inadequate, little or no training)	1 2 3 4 5
Equipment		Do the staff consider the necessary equipment is provided to carry out their jobs? **1** (well-equipped) to **5** (inadequate, little or no equipment)	1 2 3 4 5
Individual attitude		How committed do the PA staff feel to their jobs? **1** (very committed) to **5** (little commitment)	1 2 3 4 5
Incentive schemes		Are there performance incentive schemes in place? These may include money (bonuses?), promotion, other benefits **1** (good incentive schemes in place) to **5** (nothing provided)	1 2 3 4 5
b. Communication		*Assessment derived as a function of PA mgmt reporting, visitor info & links to relevant organisations e.g. academics, NGOs* ***1** (good communication in place) to **5** (nothing established)*	**Derived value**
Management Reporting		Is regular management reporting to funding bodies in place? Derived as a function of this PA's progress & comparative reports **1** (frequent and regular documented reports) to **5** (no reporting in place)	Derived value
Own progress		Is there management reporting of PA status? **1** (frequent and regular documented reports) to **5** (no reporting in place)	1 2 3 4 5
Comparative		Is there a coordinated summary management reporting across all PAs? **1** (frequent & regular documented reports) to **5** (no reporting in place)	1 2 3 4 5
Visitors centres		Is there a visitors centre at the PA, and if so is it judged to be well equipped by PA staff and visitors? (Facilities could include sale of local crafts/postcards etc. to generate revenue) **1** (present and well-equipped) to **5** (no facility present)	1 2 3 4 5
Links to other organisations		Have useful contacts been established with relevant organisations? **1** (regular & frequent contact) to **5** (no links established)	1 2 3 4 5

Detailed Framework *continued*

Factors indicating level of risk for poaching of tigers in National Parks, Reserves and Wildlife Sanctuaries

Category of factors *continued*	Level applied	Description and measures (scales of 1-5)	List of values
4. TIGER MANAGEMENT	Within and around PA	Is there a strategy or programme(s) in place to conserve the tiger in this PA? Active management is likely to reduce risk.	
a. Estimation of numbers		*Reliability of estimation of tiger numbers will be derived as a function of methods and frequency* ***1** (good level of confidence) to **5** (no estimating in place)*	**Derived value**
Methods used		Use multiple methods to cross-check estimates, e.g. camera trapping, footprint identification, capture/recapture, local knowledge? **1** (multiple methods) to **5** (no method used)	1 2 3 4 5
Frequency		Is estimating done on a regular cycle? **1** (regular & frequent) to **5** (rarely or never)	1 2 3 4 5
b. Suitability of habitat/ranges		*Does the habitat have good potential carrying capacity and has this been translated into active management? Assessment derived as a function of habitat management, tiger abundance and prey abundance* ***1** (translated to action) to **5** (nothing planned)*	**Derived value**
Habitat management		Is the habitat identified as priority tiger habitat, as defined in relevant strategies/action plans? **1** (high priority) to **5** (nothing defined)	1 2 3 4 5
Abundance of tigers		Is the abundance of tigers near the carrying capacity? **1** (abundant) to **5** (few)	1 2 3 4 5
Abundance of prey		Is the projected prey abundance adequate? **1** (abundant) to **5** (insufficient)	1 2 3 4 5
c. Anti poaching measures		*What anti-poaching measures are in place e.g. trained units on patrol; derived as a function of knowledge, dedicated anti poaching staff and frequency of patrol and boundary maintenance* ***1** (good) to **5** (insufficient)*	**Derived value**
Understanding of poaching threats		Is there good knowledge of poaching threats to this PA, derived as a function of knowledge of where, why, how, who including trading route/outlet? **1** (good) to **5** (little or none)	Derived value
Target poaching locations		Are specific areas (hot-spots) of the PA targeted by poachers? **1** (no pattern) to **5** (frequent occurrences)	1 2 3 4 5
Tiger trade potential		Is there good knowledge of trade potential from this PA e.g. how, who, why as well as trading route/outlet? **1** (good) to **5** (little or none)	1 2 3 4 5
Anti poaching staff		Derived as a special case function of staff numbers and motivation applied to dedicated anti poaching staff **1** (good) to **5** (insufficient)	Derived value
Frequency of patrolling		Frequency of patrol **1** (regular & frequent) to **5** (rare)	1 2 3 4 5
PA Boundary markings		Are the PA Boundaries clearly marked? **1** (clearly marked and maintained) to **5** (not marked)	1 2 3 4 5
d. Education programmes		*What efforts are made for education on tiger conservation? Are opportunities taken to raise awareness of tiger benefits and current plight? Can/are efforts being measured? Derived as a function of efforts for visitors inside and those outside the PA, such as local people, schools etc., and success indicators* ***1** (good effort) to **5** (little or no effort)*	**Derived value**
Visitor awareness		Does the Visitors centre in Category 3.b present tiger information? **1** (good information present) to **5** (no information present)	1 2 3 4 5
Local awareness		Are local schools and villages visited for awareness and discussion, and made aware of potential benefits of tiger presence? **1** (frequently) to **5** (never)	1 2 3 4 5

Detailed Framework *continued*

Factors indicating level of risk for poaching of tigers in National Parks, Reserves and Wildlife Sanctuaries

Category of factors *continued*	Level applied	Description and measures (scales of 1-5)	List of values
c. Education programmes *continued*			
Group trips		Are groups such as schools, local businesses/villages or tourist companies encouraged to visit? **1** (good regular and frequent advertising) to **5** (nothing provided)	1 2 3 4 5
Success indicators		Are successes measured e.g. track change in attitude or whether advertising results in those visited making the trip? **1** (good measures) to **5** (nothing provided)	1 2 3 4 5
5. LOCAL COMMUNITY	Local to PA	Are there people living in and around the PA? Their presence, situation and resulting relationships will be a vital factor. Their interaction with and attitude to tigers will dictate a powerful position from greatest ally to biggest poaching threat.	
a. Human/tiger interaction		*How much do local communities routinely come into contact with tigers? Derived as a function of proximity, density, reliance on PA materials, relative economic hardship.* ***1*** *(little or no interaction) to* ***5*** *(frequent interaction)*	**Derived value**
Human proximity/density		Relative likelihood of interaction based on number and density of villages bordering/inside the PA boundaries **1** (little likelihood) to **5** (high likelihood)	1 2 3 4 5
Reliance on PA materials		Is there heavy reliance on materials from inside the PA to survive? **1** (little reliance) to **5** (heavy reliance)	1 2 3 4 5
Relative economic hardship		What is the economic situation for villages in/around the PA, according to wealth index/earning pa wrt av. national wage)? **1** (adequate relative wealth) to **5** (very poor)	1 2 3 4 5
b. Attitude to tigers		*What is general local attitude to tigers? Derived as a function of perceived tiger threat, compensation arrangements, tiger value, and assessment of deterrents e.g. religious views. (may use children's attitude to tigers as a cross-check?)* ***1*** *(positive attitude) to* ***5*** *(negative attitude)*	**Derived value**
Threat to livestock/humans		Are tigers considered a threat to either livestock or humans? **1** (little or no threat) to **5** (regular threat)	1 2 3 4 5
Compensation schemes		Are there any compensation schemes in place for loss or damage? **1** (reliable compensation) to **5** (no compensation)	1 2 3 4 5
Potential $ value		Potential $ value of sale of tiger parts expressed as a factor of average annual income. Do villagers see the large $ value as a significant temptation to poach overriding the risk of penalty? **1** (no temptation) to **5** (significant temptation)	1 2 3 4 5
Deterrents to poaching		What are the main deterrents that serve to inhibit tiger poaching? Recorded as 3 values **A** - personal beliefs **B** - threat of penalty **C** - no financial incentive	A + B + C
c. Involvement in tiger management		*Extent to which local communities participate in tiger management programmes, with PA staff or other conservation groups? Derived as a function of opportunity for involvement through discussion & sharing of local expertise, & nature of relationships.* ***1*** *(regular participation) to* ***5*** *(little or no participation)*	**Derived value**
Opportunity for discussion		Do implementing agencies arrange opportunities for discussion on plans and progress regarding conservation programmes? **1** (regular and frequent contact) to **5** (no links established)	1 2 3 4 5
Use of local expertise		Do implementing agencies make use of local expertise in conservation programmes? **1** (regular and frequent collaboration) to **5** (no collaboration)	1 2 3 4 5
Relationship with conservation groups/PA staff		How are the local communities' relationships with any implementing agencies of conservation programmes running in this PA? **1** (generally positive) to **5** (generally negative)	1 2 3 4 5

Detailed Framework *continued*

Factors indicating level of risk for poaching of tigers in National Parks, Reserves and Wildlife Sanctuaries

Category of factors *continued*	Level applied	Description and measures (scales of 1-5)	List of values
6. MARKET FOR TIGER PARTS	Local to PA	Does a trade in tiger parts or other protected species exist in the locality? Existence is likely to increase temptation to poach.	
a. Existence and access to market		*Assessment of a market for either opportunistic or planned poaching, derived as a function of method, motive, market e.g. ease of access to poison, guns, vehicles, a negative attitude to tigers (identified above) & knowledge of how to dispose of tiger parts.* ***1** (no market) to **5** (active market)*	**Derived value**
Method		*Derived as a function of access to weaponry and market access to traders* ***1** (not easily accessible to poachers) to **5** (easily accessible to poachers)*	Derived value
Available weaponry		Ease of access to poaching equipment e.g. guns, snares, spears, poison **1** (not easily accessible to poachers) to **5** (easily accessible to poachers)	1 2 3 4 5
Tiger availability		Ease of access to tigers due to abundance and level of protection **1** (not easy access to tigers) to **5** (easy access to tigers)	1 2 3 4 5
Market access: routes/traders		Do poachers have access to transport tiger parts to traders e.g. vehicles? **1** (not easily accessible to poachers) to **5** (easily accessible to poachers)	1 2 3 4 5
Motive		Derived as assessed in Category 5.b **1** (positive attitude) to **5** (negative attitude)	Derived value
Market		Measured by indication of distance from poaching location to trader **1** (travel to town/city to trade) to **5** (trader is poacher/trader comes to PA or village)	1 2 3 4 5
7. TOURISM	To PA	What are the effects of a tourism presence on poaching threat (N.B. habitat disturbance is out of scope). It is believed that tourism can reduce poaching threat by providing benefit to retaining tigers and providing additional 'monitoring' resources.	
a. Revenue generator excluding PA		*Revenue potential from tiger tourism - is any revenue from tourism generated by/provided to/invested in local communities?* ***1** (good revenue) to **5** (no revenue stream established)*	**1 2 3 4 5**
b. Promotion of tiger as attraction		*Assessment derived from whether tigers are used as a specific attraction in advertising the PA and whether locals are aware of tiger presence providing attraction.* ***1** (positive link) to **5** (no link)*	**Derived value**
By Tour Companies		Are tigers used as a specific attraction in tour company advertising? **1** (key selling point) to **5** (not mentioned)	1 2 3 4 5
Local awareness of link?		Are locals aware of specific link between tiger presence and tourist attraction? **1** (very aware) to **5** (not aware)	1 2 3 4 5
c. Alternative 'monitoring' body		*Does a tourism presence in this PA translate to more people (hotel/tour company trackers/tourists) patrolling PAs, observing tigers and disturbing poachers?* ***1** (significant contribution) to **5** (little or no contribution)*	1 2 3 4 5

Appendix B – Example Questionnaires

NGOs and Academic Institutions Questionnaire

1. **Name of your NGO or Academic Institution?** _____
2. **Is this organisation**
   a. observing activities, with no funding or implementation? ☐
   b. funding programmes? ☐ Please name the park and your programme(s) below:

      _____

      _____

   c. implementing programmes? ☐ Please name the park and your programme(s) below:

      _____

      _____

      _____

Your Name: _____

Your Job Title: _____

Please tick here if you do not want your name to be documented ☐

In the survey below, please circle the number in the scale that best represents your experience, for example

1 2 (3) 4 5

insufficient = 1 5 = adequate

Policy and Legislation

- **Coverage**

1. Having considered which laws implement relevant International Treaties, such as CITES and CBD, do you believe this legislation to give adequate coverage of protection? Please circle one number.

1 2 3 4 5

insufficient = 1 5 = adequate

- **Enforcement**

2. Do you consider the number of staff dedicated to enforce legislation enough? (compared with other crime areas e.g. drugs?)

1 2 3 4 5

insufficient = 1 5 = adequate

3. Do you consider the funding dedicated to enforce legislation enough? (compared with other areas of crime e.g. drugs?)

1 2 3 4 5

insufficient = 1 5 = adequate

4. Is intelligence being converted to successful prosecution? e.g. number of suspected cases of poaching vs. action taken.

1 2 3 4 5

intelligence not acted on = 1 5 = seizures lead to prosecution

5. Is funding offered for information on poachers?

   No ☐ Yes ☐ If yes, how much is offered? _____

   how many times per year is money paid? (approximately) _____

6. Do the penalties fit the severity of crime, therefore acting as a deterrent?

   1 2 3 4 5
   little or no deterrent = 1 5 = effective deterrent

Funding and Governance

7. To your knowledge, are the roles and responsibilities defined for governance of the park?

   1 2 3 4 5
   not defined = 1 5 = defined and documented

8. Are the reporting requirements defined to track use of your funding?

   1 2 3 4 5
   not defined = 1 5 = defined and documented

9. Is the funding sufficient for the strategies and programmes in place in your view?

   1 2 3 4 5
   insufficient = 1 5 = considered adequate

10. Is there a funding breakdown: e.g. from central government, conservation groups/programmes etc?

    1 2 3 4 5
    not defined = 1 5 = clearly defined and documented

11. Do park budgets reliably receive your promised funding?

    1 2 3 4 5
    rarely = 1 5 = usually

12. To your knowledge, are park fees, tour/hotel company charges and visitor centre profits reinvested in the park, providing direct benefit of successful operation?

    1 2 3 4 5
    paid to government, with no clear reinvestment = 1 5 = reinvested

Park Management

13. To your knowledge, are the roles and responsibilities clearly defined and documented for park staff?

    1 2 3 4 5
    not defined = 1 5 = clearly defined and documented

14. How do you consider the number and balance of staff available across different functions: admin, management, rangers?

    1 2 3 4 5
    insufficient/incorrect balance = 1 5 = good proportions

15. Is there a mix of staff recruited locally, as well as expertise from outside the area?

    1 2 3 4 5
    no opportunity = 1 5 = local recruitment policy

16. Do a proportion of the staff rotate round other parks to gain/share expertise?

    1 2 3 4 5
    no opportunity = 1 5 = rotation policy

17. Is the terrain type of the park easy to patrol?

    1 2 3 4 5
    easy = 1 5 = hard

18. Is the park frequently visited by tourists/other groups e.g. school parties, compared with averages visiting other local attractions?

1 2 3 4 5
below average = 1 5 = above average

19. Is the pay considered a good package for the staff?

1 2 3 4 5
inadequate = 1 5 = good

20. Is the training available to perform role, and considered good for the staff?

1 2 3 4 5
inadequate, little or no training = 1 5 = good

21. Do you consider the necessary equipment is provided to carry out their jobs?

1 2 3 4 5
inadequate, little or no equipment = 1 5 = well-equipped

22. How committed do the park staff feel to their jobs?

1 2 3 4 5
little commitment = 1 5 = very committed

23. Are there performance incentive schemes in place? These may include money (bonuses?), promotion, other benefits

1 2 3 4 5
nothing provided = 1 5 = good incentive schemes in place

24. Is there a visitors centre at the park, and if so, do you judge it to be well equipped? (Facilities could include sale of local crafts/postcards etc. to generate revenue)

1 2 3 4 5
no facility present = 1 5 = present and well-equipped

Tiger Management

25. Are multiple methods used to cross-check estimates of tiger numbers? e.g. camera trapping, footprint identification, capture/recapture, local knowledge

1 2 3 4 5
no method used = 1 5 = multiple methods used

26. Is estimating of tiger numbers done on a regular and frequent basis?

1 2 3 4 5
rarely or never = 1 5 = regular and frequent

27. Is the habitat identified as priority tiger habitat, as defined in relevant strategies/action plans?

1 2 3 4 5
nothing defined = 1 5 = high priority

28. Is the abundance of tigers near the carrying capacity (maximum the park can hold)?

1 2 3 4 5
few = 1 5 = abundant, near maximum for park

29. Is the projected prey abundance adequate?

1 2 3 4 5
insufficient = 1 5 = abundant

30. Are specific areas (hot-spots) of the park targeted by poachers?

1 2 3 4 5
no pattern = 1 5 = frequent occurrences

31. Is there good knowledge of trade potential from this park e.g. how, who, why as well as trading route/outlet?

1 2 3 4 5
little or none = 1 5 = good

32. How frequent are the anti-poaching patrols?

1 2 3 4 5
rare = 1 5 = regular and frequent

33. Are the Park Boundaries clearly marked?

1 2 3 4 5
not marked = 1 5 = clearly marked and maintained

34. Does the Visitors Centre in this park present tiger information?

1 2 3 4 5
no information present = 1 5 = good information present

35. Are local schools and villages visited for awareness and discussion, and shown potential benefits of tiger presence?

1 2 3 4 5
never = 1 5 = frequently

36. Are groups such as schools, local businesses/villages or tourist companies encouraged to visit?

1 2 3 4 5
nothing provided = 1 5 = good regular and frequent advertising

37. Are successes measured e.g. track change in attitude or whether advertising results in those visited making the trip?

1 2 3 4 5
nothing defined = 1 5 = good measures defined and documented

Local Community

38. What is the relative likelihood of villagers interaction with tigers based on the number and density of villages bordering or inside the park boundaries?

1 2 3 4 5
little likelihood = 1 5 = high likelihood

39. Is there heavy reliance on materials from inside the park to survive?

1 2 3 4 5
little reliance = 1 5 = heavy reliance

40. What is the economic situation for villages in/around the park, compared with the average national wage?

1 2 3 4 5
very poor = 1 5 = adequate relative wealth

41. Are tigers considered a threat to either livestock or people by the local communities?

1 2 3 4 5
little or no threat = 1 5 = regular threat

Have you known of livestock or people being hurt or killed by a tiger?

No ☐ Yes ☐ How many incidents? _____

42. Are there any compensation schemes in place for loss or damage by tigers?

1 2 3 4 5
no compensation = 1 5 = reliable compensation

43. Do people see the large $ value as a big temptation to poach, more important than the risk of penalty?

1 2 3 4 5
no temptation = 1 5 = big temptation

44. What are the main deterrents that reduce tiger poaching? Please tick all that apply

A - personal beliefs ☐ B - threat of penalty ☐ C - no financial incentive? ☐

If other reason, please state: _____

45. Do park staff and your conservation programme arrange opportunities for discussion on plans and progress?

1 2 3 4 5
no links established = 1 5 = regular and frequent contact

46. Do park staff and your conservation programme make use of local expertise?

1 2 3 4 5
no collaboration = 1 5 = regular and frequent collaboration

47. How are the local communities' relationships with implementing agencies of your conservation programme in this park?

1 2 3 4 5
generally negative = 1 5 = generally positive

Market for tiger parts

48. How easy is access to poaching equipment e.g. guns, snares, spears, poison?

1 2 3 4 5
not easily accessible to poachers = 1 5 = easily accessible to poachers

49. How easy is the access to tigers due to abundance and level of protection?

1 2 3 4 5
not easy access to tigers = 1 5 = easy access to tigers

50. Do poachers have access to transport tiger parts to traders e.g. vehicles?

1 2 3 4 5
not easily accessible to poachers = 1 5 = easily accessible to poachers

51. How aware are you of a trade in tiger parts around this particular park e.g. how, who, why, where parts are traded?

1 2 3 4 5
not aware = 1 5 = aware

Tourism

52. Revenue potential from tiger tourism - is any revenue from tourism generated by/provided to/invested in local communities?

1 2 3 4 5
no revenue stream established = 1 5 = good revenue

53. Are tigers used as a specific attraction in tour company advertising to the park?

1 2 3 4 5
not mentioned = 1 5 = key selling point in advertising

54. Are locals aware of specific link between tiger presence and tourist attraction?

1 2 3 4 5
not aware = 1 5 = very aware

55. Do you consider that a tourism presence in this park means more people to disturb poachers?

1 2 3 4 5
little or no disturbance = 1 5 = significant disturbance

National Park Staff Questionnaire – Park Rangers / Anti-poaching patrols

Name of your National Park: _____

Your Name: _____

Your Job Title: _____

Please tick here if you do not want your name to be documented ☐

In the survey below, please circle the number in the scale that represents your experience, for example

1 2 (3) 4 5

insufficient = 1 5 = adequate

Policy and Legislation

1. Do you consider the number of staff dedicated to enforce legislation enough? (compared with other crime areas e.g. drugs?) Please circle one number.

1 2 3 4 5

insufficient = 1 5 = adequate

2. Is intelligence converted to successful prosecution? e.g. number of suspected cases of poaching vs. action taken.

1 2 3 4 5

intelligence not acted on = 1 5 = seizures lead to court case

Park Management

3. Is your role and responsibilities clearly defined and documented?

1 2 3 4 5

not defined = 1 5 = clearly defined and documented

4. How do you consider the number and balance of staff across different functions: admin, management, rangers?

1 2 3 4 5

insufficient/incorrect balance = 1 5 = good number and balance

5. Is there a mix of staff recruited locally, as well as expertise from outside the area?

1 2 3 4 5

no opportunity = 1 5 = local recruitment policy

6. Do a proportion of the staff rotate round other parks to gain and share expertise?

1 2 3 4 5

no opportunity = 1 5 = rotation policy

7. Is the terrain type of the park easy to patrol?

1 2 3 4 5

easy = 1 5 = hard

8. Is the park frequently visited by tourists or other groups e.g. school parties, compared with average numbers visiting other local attractions?

1 2 3 4 5

below average = 1 5 = above average

9. Do you consider your pay (salary) is a good package?

1 2 3 4 5

inadequate = 1 5 = good

10. Is the training available good enough to perform your job?

1 2 3 4 5
inadequate, little or no training = 1 5 = good

11. Is the necessary equipment provided to carry out your job?

1 2 3 4 5
inadequate, little or no equipment = 1 5 = well-equipped

12. How committed do you feel to this particular job?

1 2 3 4 5
little commitment = 1 5 = very committed

13. Are there performance incentive schemes in place? e.g. money (bonuses?), promotion, medical benefits, sick pay

1 2 3 4 5
nothing provided = 1 5 = good incentive schemes in place

14. Is there a visitors centre at the park, and if so do you judge it to be well equipped? (e.g. Information provided and facilities could include sale of local crafts/postcards etc. to generate revenue)

1 2 3 4 5
no facility present = 1 5 = present and well-equipped

15. Have useful contacts been established with relevant organisations? e.g. NGOs or researchers from universities

1 2 3 4 5
no links established = 1 5 = regular and frequent contact

Which organisations? _____

Tiger Management

16. Are multiple methods used to cross-check estimates of tiger numbers? e.g. camera trapping, footprint identification, capture/recapture, local knowledge

1 2 3 4 5
no method used = 1 5 = multiple methods used

17. Is estimating of tiger numbers done on a regular and frequent basis?

1 2 3 4 5
rarely or never = 1 5 = regular and frequent

18. Is the habitat identified as priority tiger habitat, as defined in relevant strategies/action plans?

1 2 3 4 5
nothing defined = 1 5 = high priority

19. Is the abundance of tigers near the maximum number the park can hold (carrying capacity)?

1 2 3 4 5
few = 1 5 = abundant, near maximum for park

20. Is the projected prey abundance adequate?

1 2 3 4 5
insufficient = 1 5 = abundant

21. Are there specific areas (hot-spots) of the park targeted by poachers?

1 2 3 4 5
no pattern = 1 5 = frequent occurrences

22. Is there good knowledge of trade potential from this park e.g. how, who, why as well as trading route/outlet?

1 2 3 4 5
little or none = 1 5 = good

23. How frequent are the anti-poaching patrols?

1 2 3 4 5
rare = 1 5 = regular and frequent

24. Are the Park Boundaries clearly marked?

1 2 3 4 5
not marked = 1 5 = clearly marked and maintained

25. Does the Visitors centre in this park present tiger information?

1 2 3 4 5
no information present = 1 5 = good information present

26. Are local schools and villages visited for awareness and discussion, and shown potential benefits of tiger presence?

1 2 3 4 5
never = 1 5 = frequently

27. Are groups such as schools, local businesses, villages or tour companies encouraged to visit?

1 2 3 4 5
ing provided = 1 5 = good regular and frequent advertising

Local Community

28. What is the relative likelihood of villagers interaction with tigers based on the number and density of villages bordering or inside the park boundaries?

1 2 3 4 5
little likelihood = 1 5 = high likelihood

29. Do park staff make use of local expertise in conservation programmes?

1 2 3 4 5
no collaboration = 1 5 = regular and frequent collaboration

30. How are local communities' relationships with park staff or any staff of conservation programmes running in this park?

1 2 3 4 5
generally negative = 1 5 = generally positive

Market for tiger parts

31. How easy is access to poaching equipment e.g. guns, snares, spears, poison?

1 2 3 4 5
not easily accessible to poachers = 1 5 = easily accessible to poachers

32. What weapons do local people use to hunt animals?_____

33. How easy is the access to tigers due to their numbers and level of protection?

1 2 3 4 5
not easy access to tigers = 1 5 = easy access to tigers

34. Do poachers have access to transport tiger parts to traders e.g. vehicles?

1 2 3 4 5
not easily accessible to poachers = 1 5 = easily accessible to poachers

35. How far does the poacher have to take the dead tiger from where it was killed to reach trader?

1 2 3 4 5
trader is poacher or trader comes to park or village = 1 5 = travel to town or city to trade

Tourism

36. Are locals aware of specific link between tiger presence and tourist attraction?

1 2 3 4 5
not aware = 1 5 = very aware

37. Does a tourism presence in this park translate to more people (hotel/tour company trackers/tourists) patrolling parks, observing tigers and disturbing poachers?

1 2 3 4 5
little or no contribution = 1 5 = significant contribution

Poachers Questionnaire

Name of your Village: _____

Your Name: _____

Please tick one: **Male** ☐ **Female** ☐

Please tick here if you do not want your name to be documented ☐

In the survey below, please circle the number in the scale that represents your experience, for example

1 2 (3) 4 5

insufficient = 1 5 = adequate

Policy and Legislation

1. When the authorities are told about poaching incidents, do they seize the evidence and successfully take to court? e.g. number of suspected cases of poaching vs. action taken.

1 2 3 4 5

intelligence not acted on = 1 5 = seizures lead to court case

2. Do the penalties match the seriousness of the crime, therefore encourage people to stop poaching?

1 2 3 4 5

little or no penalty, so ok to poach = 1 5 = risk of big penalty so no poaching

Tiger Management

3. Are specific areas (hot-spots) of the park targeted by poachers?

1 2 3 4 5

no pattern = 1 5 = frequent occurrences

4. Do local people living in/around the park know of tiger trade from this park e.g. how, who, why, where to trade?

1 2 3 4 5

little or no knowledge of trade= 1 5 = good knowledge of trade

5. Are the Park Boundaries clearly marked?

1 2 3 4 5

not marked = 1 5 = clearly marked and maintained

6. Are your local schools and villages visited for awareness or discussion, and shown potential benefits of tiger presence?

1 2 3 4 5

never = 1 5 = frequently

7. Do your school lessons include teaching about tigers?

No ☐

Yes ☐ If yes, what type of information was included? E.g.numbers, distribution, location, threats

_____

_____

8. Are groups such as your schools, local businesses/villages or tour companies encouraged to visit?

1 2 3 4 5
nothing provided = 1 5 = good regular and frequent advertising

Local Community

9. What is the relative chance of local people seeing tigers?

1 2 3 4 5
little chance = 1 5 = high chance

10. Have you seen one? No ☐ Yes ☐ If yes, how long ago? _____

11. Do you rely on materials from inside the park to survive?

1 2 3 4 5
little reliance = 1 5 = heavy reliance

12. What is the economic situation for this village, compared with the average national wage?

1 2 3 4 5
very poor = 1 5 = adequate relative wealth

13. Do you consider tigers a threat to either your livestock or family and friends?

1 2 3 4 5
little or no threat = 1 5 = regular threat

14. Have you known of livestock or family being hurt or killed by a tiger?

No ☐ Yes ☐

15. Are there any compensation schemes in place for loss or damage by tigers?

1 2 3 4 5
no compensation = 1 5 = reliable compensation

16. Have you needed to claim compensation?

No ☐ Yes ☐ If yes, how much did you receive? _____

17. Do people see the large $ value as a big temptation to poach, more important than the risk of penalty?

1 2 3 4 5
no temptation = 1 5 = big temptation

18. What are the main reasons that reduce tiger poaching? Please tick all that apply

A - personal beliefs ☐ B - threat of penalty ☐ C - no financial incentive ☐

If other reason, please state: _____

19. Do park staff and conservation programmes arrange opportunities for you to discuss plans and progress?

1 2 3 4 5
no links established = 1 5 = regular and frequent contact

20. Do park staff and conservation programmes make use of your village's local expertise?

1 2 3 4 5
no collaboration = 1 5 = regular and frequent collaboration

21. How do you feel about the NGOs and park staff in this park?

1 2 3 4 5
generally negative = 1 5 = generally positive

Market for tiger parts

22. How easy is access to poaching equipment e.g. guns, snares, spears, poison?

1 2 3 4 5
not easily accessible to poachers = 1 5 = easily accessible to poachers

23. What weapons do local people use to hunt animals?

_____

24. How easy is the access to tigers due to the number of them and level of protection?

1 2 3 4 5
not easy access to tigers = 1 5 = easy access to tigers

25. Do poachers have access to transport tiger parts to traders e.g. vehicles?

1 2 3 4 5
not easily accessible to poachers = 1 5 = easily accessible to poachers

26. How far does the poacher have to take the dead tiger from where it was killed to reach trader?

1 2 3 4 5
trader is poacher, or trader comes to park or village = 1 5 = travel to town or city to trade

Tourism

27. Is any revenue (money) from tourism generated by and/or re-invested in your local community?

1 2 3 4 5
no revenue stream established = 1 5 = good revenue

28. Do you think that tourists in this park means more people to disturb poachers?

1 2 3 4 5
little or no disturbance = 1 5 = significant disturbance

29. Are local people aware of specific link between tiger presence and tourist attraction?

1 2 3 4 5
not aware = 1 5 = very aware

Facts research

- How much does a poacher receive from a trader for the following?
  - a tiger skin _____
  - Bones (per kg) _____
  - Claws _____
  - Teeth _____
  - Penis _____
- How much does a poacher receive from a trader for a whole dead tiger? _____

- What method do poachers use for catching tigers? _____
- What method do they use for killing tigers? _____
- How much is the fine for poaching tigers? _____
- How much is the fine for being caught with tiger parts? _____
- Do they kill tiger if they have chance, for selling the parts? _____

  in the forest? ☐

  in the village? ☐
- Does someone come and pay them to poach tiger? _____
- Where are the traders from? _____
- Is it always the same trader who buys? Yes ☐ No ☐
- How far do poachers have to carry the dead tiger to the trader? _____ kms

Trader at: forest ☐ village ☐ local market ☐ town ☐ city ☐

- How do they carry the dead tiger?

  People ☐ vehicle ☐ what other way? _____

Appendix C – Example of a Completed Questionnaire

Teachers

แบบสอบถาม – สำหรับชุมชนท้องถิ่น

ชื่อหมู่บ้าน: Ban Thonglang. หมู่ 5 ต. อากอง อ.พังงา จ.ภูเก็ต

ชื่อ-สกุล: สุลิต เหมนรง Saulit Muenmarong

เพศ: ชาย ☑ หญิง ☐ อายุ 45 อาชีพ ชาวนา farmer.

กาเครื่องหมายที่นี่ หากไม่ต้องการแจ้งชื่อ ☐ เป็นอาสาสมัครมา... Volunteer for how long?

โปรดวงกลมรอบตัวเลขที่คุณเลือก ตัวอย่าง

1 2 (3) 4 5

ง่ายมาก = 1 5 = ยากมาก

เชิงนโยบายและกฎหมาย

1. เมื่อได้รับแจ้งว่ามีการล่าสัตว์ เจ้าหน้าที่ที่รับผิดชอบให้ความสำคัญ และดำเนินการจับกุม อย่างมีประสิทธิภาพเพียงใด

1 2 3 4 (5)

ไม่มีการดำเนินการใดๆ = 1 5 = ดำเนินการจนถึงขั้นศาล

2. บทลงโทษทางกฎหมายที่รุนแรง ส่งผลให้การล่าสัตว์ลดลงหรือไม่

1 2 3 4 (5)

โทษไม่หนัก เสี่ยงล่า =1 5 =ไม่อยากเสี่ยงต่อโทษหนัก หยุดล่า

การจัดการเกี่ยวกับเสือโคร่ง

3. มีจุดที่พวกลักลอบล่าสัตว์เข้ามาล่าสัตว์ในพื้นที่หรือไม่

(1) 2 3 4 5

ไม่มี = 1 5 = มีมากมาย

4. ชุมชนชาวบ้านรอบพื้นที่ รู้ว่ามีการค้าเสือโคร่งในพื้นที่หรือไม่ เช่น วิธีเสนอขาย ขายให้ใคร ขายอย่างไร ขายที่ไหน

(1) 2 3 4 5

รู้น้อยมาก = 1 5 = รู้รายละเอียดอย่างดี

5. แนวเขตพื้นที่เขตรักษาพันธุ์ฯมีเครื่องหมายชัดเจนดีหรือไม่

1 2 3 4 (5)

ไม่มีเครื่องหมายใดๆ = 1 5 = ชัดเจน ได้รับการดูแลอย่างดี

6. โรงเรียนรอบพื้นที่ให้ความสนใจในการอนุรักษ์เสือโคร่ง พูดถึงการมีอยู่ของเสือโคร่งหรือไม่

1 2 3 4 5

ไม่เคย = 1 5 = บ่อยๆ

7. โรงเรียนที่เคยเรียน เคยมีการสอน/ให้ความรู้เกี่ยวกับเสือโคร่งหรือไม่

ไม่สอน ☑

สอน ☐ ถ้าสอน มีการสอนอะไรบ้าง เช่น จำนวน การแพร่กระจาย ถิ่นอาศัย การอนุรักษ์โปรดระบุ

_____

_____

8. มีการสนับสนุนกลุ่มต่างๆ เช่น โรงเรียน ธุรกิจเอกชน กิจกรรมท่องเที่ยวเชิงอนุรักษ์ ให้เข้ามาในพื้นที่เพื่อให้เข้าใจถึงการอนุรักษ์หรือไม่

1 2 3 4 5

ไม่มีการจัด = 1 5 = มีการจัดและประชาสัมพันธ์สม่ำเสมอ

<u>ชุมชนท้องถิ่น</u>

9. คนในท้องถิ่นเองมีโอกาสเห็นเสือโคร่งหรือไม่

(1) 2 3 4 5

โอกาสน้อย = 1 5 = โอกาสสูงมาก

10. คุณเคยเห็นเสือโคร่งหรือไม่

ไม่เคย ☐ เคย ☑ ถ้าเคย เมื่อใด 10 กว่าปีก่อน 10 years ago.

11. คุณอาศัยยังชีพจากแหล่งอาหารในเขตรักษาพันธุ์สัตว์ป่าหรือไม่

(1) 2 3 4 5

พึ่งพาเล็กน้อย = 1 5 = ต้องพึ่งพาอย่างมาก

12. ฐานะของหมู่บ้านนี้เป็นอย่างไร เปรียบเทียบกับหมู่บ้านอื่น

(1) 2 3 4 5

จนมาก = 1 5 = มีฐานะ

13. คุณสนใจพูดถึงเรื่องการอนุรักษ์เสือกับญาติ ครอบครัว หรือเพื่อนหรือไม่

1 2 3 4 5

น้อยมาก = 1 5 = เป็นประจำ

14. ทุณรู้จักใคร หรือคนในครอบครัวที่เคยถูกเสือทำร้าย บาดเจ็บหรือถึงแก่ชีวิตหรือไม่

ไม่มี [✓] มี [ ]

15. มีการจ่ายชดเชยต่อความเสียหายต่างๆที่เกิดจากเสือโคร่งหรือไม่

(1) 2 3 4 5

ไม่มีการชดเชย = 1 5 = มีการชดเชยอย่างเต็มที่

16. ต้องการเรียกร้องการชดเชยหรือไม่

ไม่ต้องการ [✓] ต้องการ [ ] ถ้าต้องการ คิดว่าควรเป็นเท่าใด _____

17. ชาวบ้านเห็นว่าเงินจำนวนมากล่อใจให้ล่าสัตว์ มากกว่าการถูกจับหรือไม่

(1) 2 3 4 5

ไม่ล่อใจ = 1 5 = เงินมากล่อใจมาก

18. อะไรเป็นสิ่งสำคัญที่ทำให้การล่าเสือโคร่งลดลง โปรดเลือก

A - ความเชื่อส่วนบุคคล [ ] B - กลัวถูกจับ [✓] C - มีพอกินไม่อดอยาก [ ]

เหตุผลอื่น โปรดระบุ : _____

19. หน่วยงานรัฐ หรือโครงการอนุรักษ์สิ่งแวดล้อม เปิดโอกาสให้คุณมีส่วนร่วมในการหารือเพื่อกำหนดแผน และเป้าหมายหรือไม่

1 2 3 4 (5)

ไม่เปิดโอกาส = 1 5 = เปิดโอกาสอย่างมาก

20. เขตรักษาพันธุ์สัตว์ป่า หรือโครงการอนุรักษ์สิ่งแวดล้อม ได้นำภูมิปัญญาท้องถิ่นไปปรับใช้หรือ เช่น ความรู้เรื่องสมุนไพร ความเชี่ยวชาญในการติดตามสัตว์ป่า ฯลฯ

1 (2) 3 4 5

ไม่มีการร่วมมือกันเลย= 1 5 = ร่วมมือกันบ่อย และสม่ำเสมอ

21. คุณมีทัศนคติต่อองค์กรเอกชน และเจ้าหน้าที่ป่าไม้ในพื้นที่อย่างไร

1 2 3 4 (5)

รู้สึกไม่ดี = 1 5 = รู้สึกดี

<u>แหล่งขายชิ้นส่วนเสือโคร่ง</u>

22. อุปกรณ์ล่าสัตว์ เช่น ปืน หอก กับดัก ยาเบื่อ หาได้ง่ายหรือไม่ในละแวกหมู่บ้านของท่าน

(1) 2 3 4 5

หาไม่ง่าย = 1 5 = หาได้ง่ายมาก

23. ชาวบ้านทั่วไปใช้อะไรล่าสัตว์? ปืน/ GUN

24. เป็นเรื่องง่ายหรือไม่ที่จะพบเสือเพื่อล่า จากจำนวน และมาตรการป้องกันที่เป็นอยู่?

(1) 2 3 4 5

ไม่ใช่เรื่องง่าย = 1 5 = เป็นเรื่องง่ายมาก

25. นักล่าสัตว์ ใช้พาหนะในการนำซากสัตว์ส่งไปให้ผู้ซื้อได้อย่างสะดวกสบายหรือไม่

(1) 2 3 4 5

ยากลำบาก = 1 5 = สะดวกสบายมาก

26. นักล่าสัตว์ต้องขนซากเสือไปส่งผู้ซื้อที่ไหน ? ระยะทาง 20 ก.ม.

ซื้อขายที่ไหน: ในป่า ☐ หมู่บ้าน ☐ ตลาดในท้องถิ่น ☐ ตัวอำเภอ ☑ ตัวจังหวัด ☐

การท่องเที่ยว

27. มีเงินรายได้หมุนเวียน หรือการลงทุนด้านการท่องเที่ยว ในชุมชนท้องถิ่นของเท่านหรือไม่

(1) 2 3 4 5

ไม่มี = 1 5 = มีมากมาย

28. คุณคิดว่าการท่องเที่ยวจะสร้างปัญหาให้กับนักล่าสัตว์หรือไม่

1 2 3 4 (5)

ไม่รบกวนเลย หรือรบกวนน้อยมาก= 1 5 = สร้างปัญหาอย่างมาก

29. คนในท้องถิ่น ระมัดระวังว่าการเปิดการท่องเที่ยวจะกระทบต่อการมีอยู่ของเสือหรือไม่

(1) 2 3 4 5

ไม่สนใจ = 1 5 = ระแวดระวังมาก

ข้อเท็จจริงจากการวิจัย

- นักล่าสัตว์ทำเงินจากชิ้นส่วนเสือโคร่งเท่าใด?
  - หนังเสือ ไม่รู้ (ไม่รู้) don't know.
  - กระดูก (ต่อก.ก.) _____
  - เล็บ _____
  - ฟัน _____
  - อวัยวะเพศผู้ _____
- เสือโคร่งทั้งตัว นักล่าสัตว์ขายได้เท่าใด? _____
- นักล่าสัตว์จับเสือโคร่งด้วยวิธีใด? ยิง shooting
- ใช้วิธีใดในการฆ่าเสือโคร่ง? ยิงด้วยปืน Gun
- การล่าเสือมีโทษหนักหรือไม่(จำคุก/ปรับ)? _____
- หากถูกจับพร้อมชิ้นส่วนอวัยวะของเสือโคร่ง จะถูกลงโทษอย่างไร (จำคุก/ปรับ)?

  _____
- นักล่าเสือฆ่าเสือเพื่อขายชิ้นส่วนใช่หรือไม่ ? _____
  - ฆ่าข้างหลังในป่า ☑
  - ฆ่าข้างหลังในหมู่บ้าน? ☐
- มีผู้เข้ามาจ้างวานให้ล่าเสือโคร่งใช่หรือไม่? ใช่ Yes
- ผู้สั่งซื้อเสือโคร่งมาจากไหน? (ระบุหมู่บ้าน อำเภอ จังหวัด) ต่างจังหวัด Another Province
- ผู้ซื้อเป็นคนเดิมใช่หรือไม่? ใช่ ☐ ไม่ใช่ ☑

- นักล่าสัตว์ต้องขนซากเสือไปส่งผู้ซื้อที่ไหน ? ระยะทาง 10 ก.ม.

  ซื้อขายที่ไหน: ในป่า ☐ หมู่บ้าน ☑ ตลาดในท้องถิ่น ☐ ตัวอำเภอ ☐ ตัวจังหวัด ☐

- นักล่าสัตว์ขนเสือที่ล่าได้อย่างไร?

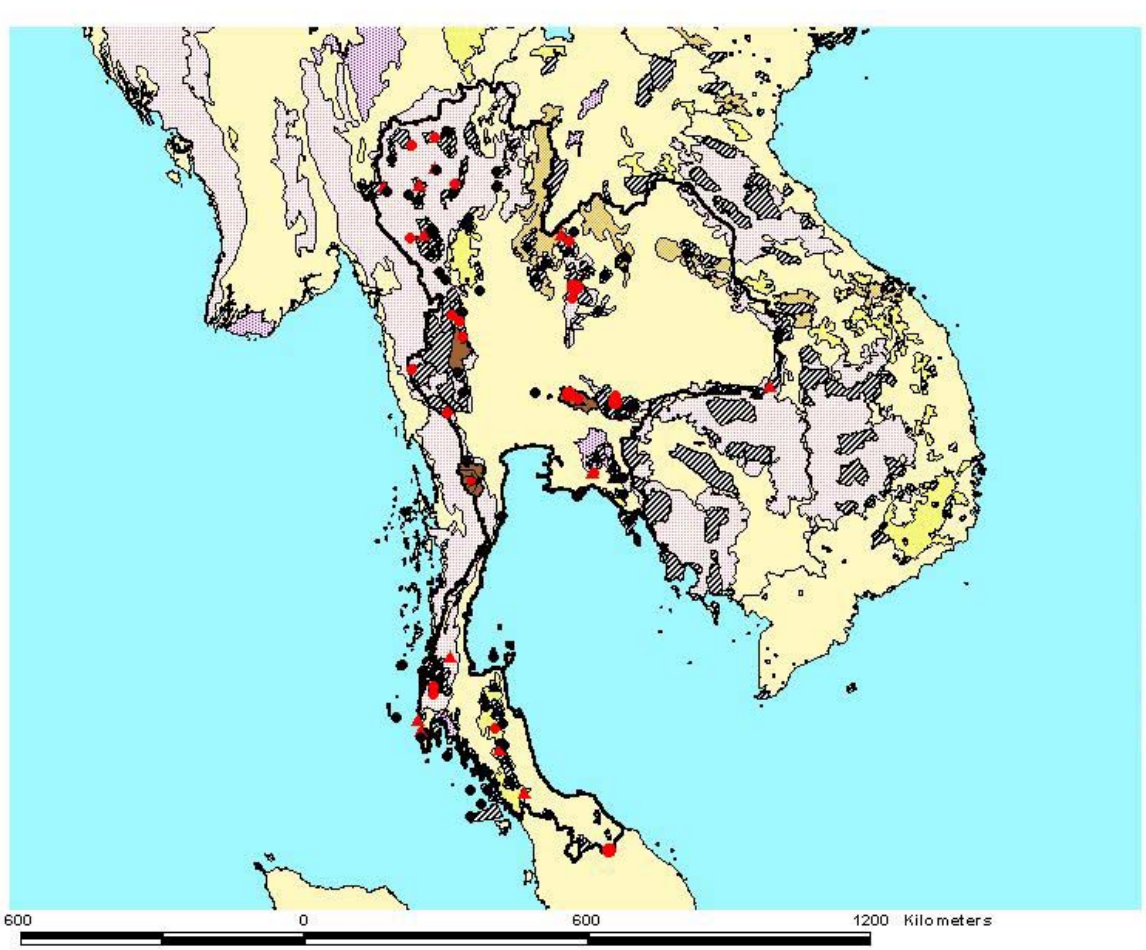
  ใช้แรงคน ☑ รถยนต์ ☐ วิธีอื่น (โปรดระบุ) ? _____

2 cubs

10 years ago this man shot Tiger and took her baby to sale for private zoo for 80,000 Baht.

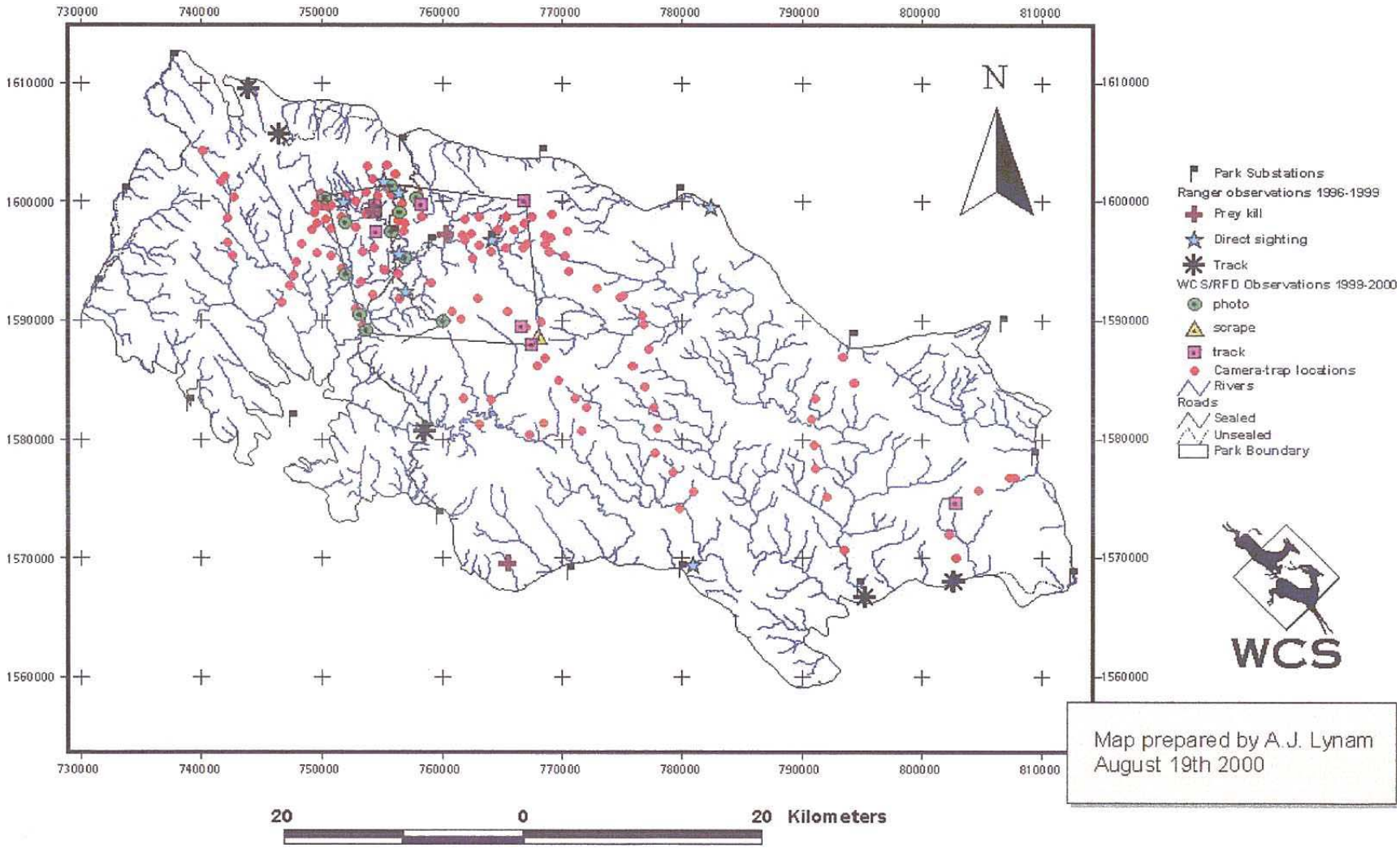
Appendix D – Test sites for tiger fieldwork in Thailand

Test sites for tiger fieldwork in Thailand, August-September 2002



Appendix E – Tiger Observations in Khao Yai National Park

Tiger Observations in Khao Yai National Park 1996-2000



Appendix F – Fact Sheet, used in surveying

Fact sheet

Sources _____

Which protected areas is this information relevant to?_____

Poacher to Trader

1) How much does a poacher receive from a trader for the following?

   a. a tiger skin _____

   b. Bones (per kg) _____

   c. Claws _____

   d. Teeth _____

   e. Penis _____

2) How much does a poacher receive from a trader for a whole dead tiger? _____

Poachers

3) What method do poachers use for catching tigers? _____
4) What method do they use for killing tigers? _____
5) How much is the fine for poaching tigers? _____
6) How much is the fine for being caught with tiger parts? _____
7) Do they kill tiger if they have chance, for selling the parts? _____
   in the forest? ☐
   in the village? ☐
8) Does someone come and pay them to poach tiger? _____
9) Where are the traders from? _____
10) Is it always the same trader who buys? Yes ☐ No ☐
11) How far do poachers have to carry the dead tiger to the trader? _____ kms
    Trader at: forest ☐ village ☐ local market ☐ town ☐ city ☐

12) How do they carry the dead tiger?
    People ☐ vehicle ☐ what other way? _____

Park

13) How big is the park? _____ sq kms

14) What is the terrain type?

_____

_____

15) How much is a ranger paid? Baht per month _____

16) Are there extra payments from conservation programmes?

No ☐ Yes ☐ If yes, how much per month _____

17) What other benefits are there for rangers?

Bonuses or extra payments ☐
Sick pay ☐
Medical benefits ☐
Pension ☐
Family allowance ☐

18) How many tigers are estimated to be in the National Park/Wildlife Sanctuary? _____

Consumers

19) How much for a consumer to buy a skin?

20) How much for the following common tiger products?

a. Tiger trophy head _____
b. Claws _____
c. Teeth _____
d. Penis _____
e. Tiger bone pills (per kg) _____
f. Tiger bone plasters (box) _____
g. Tiger bone wine (bottle) _____