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COMMUNITY ATTITUDES TOWARD PROTECTED AREAS IN THAILAND

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ABSTRACT

Local people's attitudes toward protected areas and the biodiversity they safeguard are essential for conservation success. Consequently, local people need to be included in conservation decision making. Our case study investigates local village residents' understanding of wildlife, and how this understanding shapes their conservation attitudes and perceptions toward protected areas in Thailand. We conducted verbal interviews of 791 people in 34 villages around seven protected areas. Respondents who lived close to a protected area with more formal education had a higher ability to correctly identify photographs of wildlife. Contact with rangers was not strongly correlated with people's wildlife knowledge or conservation attitudes. In open-ended interviews, people frequently said they believe wildlife should be conserved for the next generation. Our interview surveys provided information that can help inform conservation decisions by protected area managers. For example, local residents often are more keenly aware of existing human–wildlife conflict as exemplified by our interviews at Samran Wildlife Sanctuary and Khao Yai National Park. As seen at Dong Yai Wildlife Sanctuary, local residents can also provide useful information about the severity of poaching. Our research demonstrates the usefulness of actively encouraging local communities to participate in protected area conservation. This can only be achieved, however, if protected area staff, as well as local non-government organizations, collaborate with the communities.

Key words: conservation attitudes, local knowledge, interview surveys, wildlife management

INTRODUCTION

Involvement of local stakeholders in protected area management is vital to successful and long-term conservation projects (HEINEN, 1993; DURBIN & RALAMBO, 1994; FIALLO & JACOBSON, 1995; NEPAL, 2002; HOLMES, 2003). A stakeholder is any person who may be affected by, or may affect, wildlife or conservation management actions (DECKER *ET AL.*,

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2002). When conservation managers actively involve these stakeholders in conservation plans, managers improve decisions by updating wildlife status information, educating citizens about species or natural systems, and building support for conservation actions (CLARK *ET AL.*, 1996; LAFON *ET AL.*, 2004).

The foundation of the Royal Forest Department (RFD) in Thailand was modeled after British forestry practices whose key tenet was based on taking control of the forests away from local communities to manage them for national economic and conservation goals (WITTAYAPAK & DEARDEN, 1999; ROTH, 2004). Even as management concepts have evolved, there are only a few examples of protected area conservation in Thailand that include local people as stakeholders. One example is the Mae Tho pilot project in 1997 where an attempt was made to maintain the boundaries of the park, but create multiple-use buffer zones with local residents (ROTH, 2004). However, both sides became frustrated and park managers ended up dealing with increasing levels of protests from villagers who were suspicious of the RFD (ROTH, 2004). Another attempt was made in 2005 at Kuiburi National Park when the RFD initiated a five-year project to strengthen the relationship between people and protected area staff through participatory planning and co-management (PARR *ET AL.*, 2008). While the collaboration did produce an elephant management report, it is unclear why the concept was not sustainable beyond the pilot stage. The RFD has since remade itself to be more conservation-focused as the Department of National Parks, Wildlife, and Plant Conservation. In the future, this agency may also move further from policing mechanisms to conserve resources (ALBERS & GRINSPOON, 1997; NEPAL, 2002) and begin to include local people or other stakeholders, like non-government organizations (NGOs), on park management boards.

Local communities are a key source of information and can be a source of problems or solutions for solving conservation problems. For example, protected areas in Thailand typically lack buffer zones and villagers often grow crops or graze livestock abutting conservation land. As a result, human-wildlife conflict (e.g. crop raiding by wild pigs and elephants) is common and has become a point of contention for many of the villagers living adjacent to the protected areas (e.g. SRIKRACHANG, 2005). Villagers may be intimately aware of wildlife issues and human-wildlife conflicts in their region, but do not have an opportunity to explain their problems nor provide input for the development of effective and sustainable conflict management solutions (K. Jenks pers. obs.). Additionally, the stakeholders' tolerance of wildlife problems may negatively impact their support for conservation in general (RILEY *ET AL.*, 2002; SILLERO-ZUBIRI & SWITZER, 2004).

The aim of this study is to assess how local knowledge and perceptions may help guide conservation management plans in Thailand's protected areas. We conducted villager interviews at seven protected areas to learn: (1) how knowledgeable villagers are about local wildlife, (2) where they perceive the largest wildlife threats and from what species, (3) where they allege the greatest poaching pressure is occurring, (4) how they perceive protected areas and the work of rangers, and (5) where they receive the majority of their information about wildlife and conservation messages. By doing so, we attempted to highlight wildlife problems from the perspective of local stakeholders, examine the impacts of protected area rangers on shaping conservation attitudes, and identify outreach targets for conservation managers.

METHODS

Study Area

We interviewed 791 people from 34 villages from May 2007 through August 2009 living adjacent to seven protected areas in Thailand: Dong Yai Wildlife Sanctuary (DY; 313 km^2 founded in 1996), Huai Sala Wildlife Sanctuary (HS; 380 km^2 founded in 1990), Huai Samran Wildlife Sanctuary (HSAM), Huai Tabtan Wildlife Sanctuary (HT; HSAM and HT total 502 km^2 founded in 1995), Khao Ang Rue Nai Wildlife Sanctuary (KARN; 1,079 km^2 founded in 1992), Khao Yai National Park (KYNP; 2,168 km^2 founded in 1961), and Phanomdongrak Wildlife Sanctuary (PD; 316 km^2 founded in 1992; Thailand Ministry of Culture, 2013; Figure 1).

Students from Kasetsart University, Thailand and research assistants from KARN conducted the questionnaire in Thai, the national language. We randomly selected one individual per household that was 18 years or older (average age 46 years) and made an effort to equally survey men (51%) and women. Socio-economic details are reported in Jenks (2012). To evaluate wildlife knowledge, we asked participants to identify 11 mammal species from photographs, including one non-native species (Table 1). Other questions in the survey included: 12 demographic questions, four questions related to human-wildlife conflict, one question about the frequency of ranger visits to the village, one question about the source of

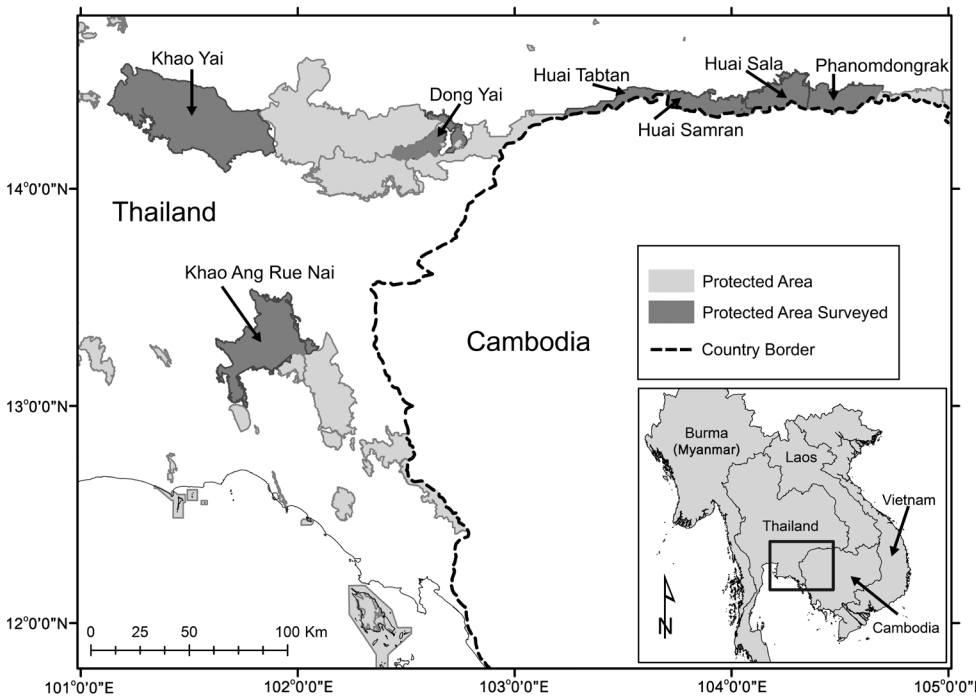

Figure 1. Thailand protected areas where surveys of villagers were conducted during May 2007 through August 2009.

Table 1. Local resident's ability to correctly identify wildlife species from photographs during interview surveys from November 2007 through August 2009 in Thailand.

Species	Thai phonetic names	Percent correct identification	Percent with no answer
Tiger (*Panthera tigris*)	seua, seua khrong	98	0
Leopard *(Panthera pardus)*	seua dao	80	7
Clouded Leopard *(Neofelis nebulosa)*	seua lai make	9	31
Leopard Cat *(Prionailurus bengalensis)*	maew dao	8	17
Large Indian Civet *(Viverra zibetha)*	cha mot, cha mot chiang, ehen lain nok, ehen tham ma da	50	43
Dhole (*Cuon alpinus*)	maa nai	20	10
Asiatic Jackal (*Canis aureus*)	maa jing jawk, jing jawk	41	18
Maned Wolf *(Chrysocyon brachyurus)*	chanit dang bratet	1	35
Sambar Deer *(Rusa unicolor)*	gwang, gwang baa	80	9
Barking Deer *(Muntiacus munjak)*	geng	70	8
Banteng *(Bos javanicus)*	wua daeng	30	3

messages about wildlife, and one open-ended question: "Is there anything else you would like to tell us about wildlife conservation or the adjacent protected area?" Rangers were defined as the park or wildlife sanctuary employees that regularly conduct forest patrols and come into direct contact with villagers.

Data Analysis

We chose *a priori* predictor variables and conducted a linear regression to identify factors contributing to villagers' wildlife knowledge as judged by their photo score (number of wildlife photos correctly identified). Variables included the distance of a respondent's village from the protected area boundary, level of education achieved, number of trips into the forest in the last six months, whether or not a respondent saw or heard a message about wildlife in the last month, and whether or not rangers visited their village in the last year. We compared all possible models with Akaike Information Criterion (AIC, BURNHAM & ANDERSON, 2002). The significant covariates of the AIC-best model (*distance* and *school*) were used to predict the photo scores by education level (Figure 2). Distance from villages to nearest protected area was calculated in ArcGIS version 9.3 (ESRI Inc. Redlands, USA).

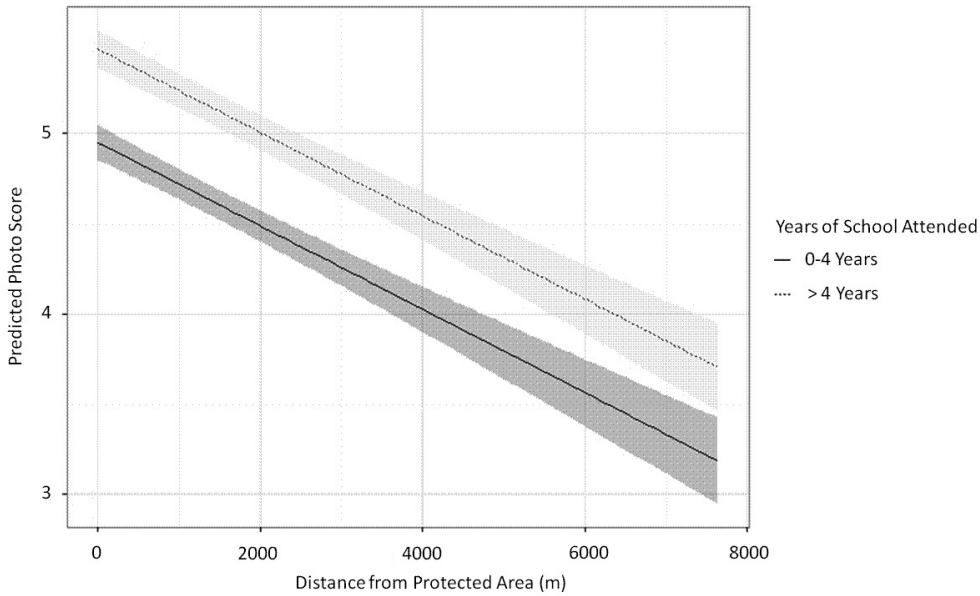

Figure 2. Predicted photo scores taking into account distance from protected area and years of schooling. Higher score = more correct identifications of wildlife photographs. Grey shading represents 95% confidence intervals.

RESULTS

When presented with a wildlife photograph, most respondents provided the correct common name for tiger (*Panthera tigris*; 98%), leopard (*Panthera pardus*; 80%), sambar deer (*Rusa unicolor*; 80%), and barking deer (*Muntiacus muntjak*; 70%; Table 1). Fewer than 10% of respondents were able to correctly label smaller cat species and fewer than 45% were able to correctly label wild canid species. Males correctly identified a significantly higher percentage of photographs (47% of the 11 photos) than females (40%); X^2 (10, n = 791) = 62.63, $p < 0.001$.

A simple regression model with distance from protected area, level of schooling, and number of trips into the forest was best at explaining knowledge of wildlife based on correct photo identification, however, trips into the forest was not a significant variable (Tables 2 and 3).

Approximately half of the respondents at HSAM (52%) and KYNP (49%) agreed with the statement that "wildlife causes problems for me or my family" (Table 4). The lowest agreement with the statement was at KARN (22%). Of those people who listed a specific species, the majority of conflicts were with elephants (*Elephas maximus*; 187 complaints) and wild pigs (*Sus scrofa*; 93 complaints; Table 4). Few people reported poaching as a serious problem and of those who answered the final questions, the percentage of people who felt that poaching needed to be decreased varied between three and 13% with the greatest need to address poaching at DY (Table 5).

Except for DY and HS protected areas, the first or second-highest noted task performed by the rangers was teaching (Figure 3). However, the percent of villagers at each protected

area who reported ranger contact (66% in total across all protected areas) was not correlated ($r = –0.21$, $p = 0.66$, $n = 7$) with the percent of people who made positive comments about conservation.

As a measure of attitudes toward protected areas, villagers were asked to respond to the open-ended question: "Is there anything else you would like to tell us about wildlife conservation or the nearest protected area?" Of the respondents who chose to comment on the question, villagers near HSAM made the most positive comments ($n = 51$) about rangers, while villagers around KYNP made the fewest positive comments (n=1) about encounters with rangers (Table 5). Most people discussed whether they perceived the protected area rangers to do their jobs well or commented on conservation in a positive way. Of those people who offered an opinion, respondents at PD were the most optimistic about conservation with 78% stating conservation is important. A minority voiced negative comments directed at park rangers (Table 5).

Table 2. Multiple logistic regression models explaining degree of wildlife knowledge by local residents adjacent to protected areas in Thailand, based on variables included in models.

Model	K	logLik	AICc	ΔAICc	w_i
distance + school + forest.trips	5	–870.18	1750.50	0.00	0.58
distance + wildlife.messages + school + forest.trips	6	–870.17	1752.54	2.04	0.21
distance + ranger.visits + school + forest.trips	6	–870.17	1752.54	2.04	0.21

K is number of parameters in model; logLik is log-likelihood; ΔAICc is difference in AICc (model score) value, model with ΔAICc value of 0 has most support; w_i = Akaike model weights. Only models with support (ΔAICc < 4) are shown. *distance* = distance from protected area boundary to village (m); *school* = 0–4 years (0), >4 years (1); *forest.trips* = number of trips to the forest in the past 6 months; *wildlife.messages* = saw/heard a message about wildlife in the past month (1), did not encounter such a message (0); *ranger.visits* = saw a park ranger visit their village in the past year (1); did not encounter any rangers (0).

Table 3. Estimates of coefficients derived from the top model, standard error (SE) and its 95% confidence interval (CI).

Variable	Estimated coefficient*	SE	Lower 95% CI	Upper 95% CI
intercept	5.0690	0.1455	4.7829	5.3547
distance	–0.0002	0.0000	–0.0003	–0.0001
school	0.5835	0.1708	0.2479	0.9192
trips.to.forest	–0.0009	0.0025	–0.0059	0.0040

*Overlap with zero indicates a weak effect or no effect.

Table 4. Local perceptions of wildlife conflict as derived from interview surveys near protected areas in Thailand.

Protected area	Number interviewed	% agreed they face wildlife problems	Conflict with wildlife*				
			Elephant	Wild pig	Gaur	Macaque sp.	Other
Dong Yai WS (DY)	100	43	51	1	0	0	0
Huai Sala WS (HS)	102	42	0	9	0	2	2
Huai Samran WS (HSAM)	82	52	1	7	0	0	1
Huai Tabtan WS (HT)	121	36	0	4	0	0	2
Khao Ang Rue Nai WS (KARN)	200	22	121	56	12	12	8
Khao Yai NP (KYNP)	87	49	12	5	3	0	7
Phanomdongrak WS (PD)	99	43	2	11	0	2	1

*not all respondents listed species involved in the perceived wildlife conflict and some listed more than one species.

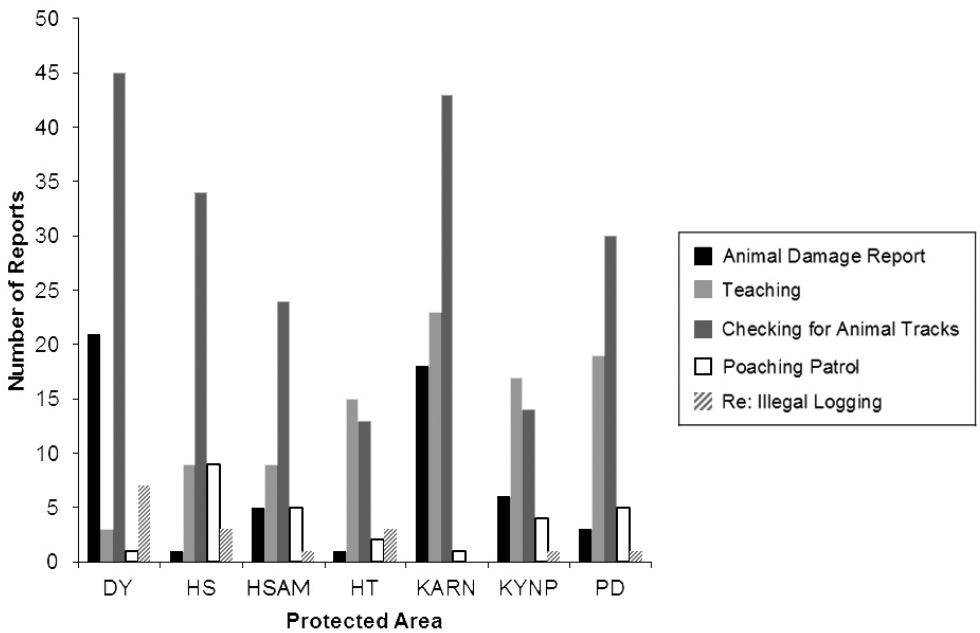

Figure 3. Tasks respondents perceived rangers to undertake when visiting their village. Dong Yai Wildlife Sanctuary (DY), Huai Sala Wildlife Sanctuary (HS), Huai Samran Wildlife Sanctuary (HSAM), Huai Tabtan Wildlife Sanctuary (HT), Khao Ang Rue Nai Wildlife Sanctuary (KARN), Khao Yai National Park (KYNP), and Phanomdongrak Wildlife Sanctuary (PD).

Table 5. Summary of respondents' perceptions of protected areas based on an interview survey conducted in villages adjacent to seven of Thailand's protected areas. Sample size represents number of people who responded to the final question.

Comments	DY ($n = 60$)	HS ($n = 83$)	HSAM ($n = 75$)	HT ($n = 103$)	KARN ($n = 192$)	KYNP ($n = 36$)	PD ($n = 77$)
Conservation is important for the next generation and/or wildlife	46 (77%)	45 (54%)	46 (61%)	52 (50%)	52 (27%)	23 (64%)	60 (78%)
Rangers do their job well (arrest and punish poachers)	10 (17%)	20 (24%)	51 (68%)	23 (22%)	26 (14%)	1(3%)	21 (27%)
Poaching is a problem	8 (13%)	7 (8%)	6 (8%)	7 (7%)		3 (8%)	2 (3%)
Rangers are doing a poor job (animal numbers decreasing, they are not honest)	1 (2%)	3 (4%)	9 (12%)	10 (10%)	9 (5%)	2 (6%)	4 (5%)
Need collaboration between rangers and community/ rangers should share knowledge	2 (3%)	1 (1%)	7 (9%)	3 (3%)	5 (3%)	5 (14%)	
Elephants cause me problems	5 (8%)				25 (13%)		
Need to strengthen rules to hunt		4 (5%)	3 (4%)		1 (<1%)	4 (11%)	1 (1%)
Rangers should allow villagers to hunt	1 (2%)	3 (4%)	1 (1%)	1 (1%)	3 (2%)	4 (11%)	
Human-wildlife conflict is a problem/ we want a barrier or fence					20 (10%)	2 (6%)	
The park should help villagers develop ecotourism or alternative occupations						5 (14%)	
Should increase number of rangers		2 (2%)	4 (5%)	1 (1%)			2 (3%)
We should grow trees		1 (1%)			1 (<1%)	2 (6%)	1 (1%)
Park ticket prices are too expensive						2 (6%)	
Illegal logging is a problem				3 (3%)		1 (3%)	
The government should return protected area land to the local people	1 (2%)			1 (1%)			
Wild animals are sold along the highway	1 (2%)						
The border area is a problem because there is no clear boundary			2 (3%)				
Do not like wildlife/conservation					5 (3%)		

Dong Yai Wildlife Sanctuary (DY), Huai Sala Wildlife Sanctuary (HS), Huai Samran Wildlife Sanctuary (HSAM), Huai Tabtan Wildlife Sanctuary (HT), Khao Ang Rue Nai Wildlife Sanctuary (KARN), Khao Yai National Park (KYNP), and Phanomdongrak Wildlife Sanctuary (PD).

DISCUSSION

The majority of villagers have poor knowledge about wildlife species in adjacent protected areas. This is of concern because people are less likely to protect species or areas that they do not know (e.g. Abram, 1996). The distance a respondent lived from a protected area and their level of schooling were the most important factors influencing their ability to identify wildlife photographs. Participants near KYNP had the highest percentage of correctly identified photographs which may be due to KYNP being the only park in our survey that has a well-developed visitor's center. The majority of wildlife messages were viewed by people on iTV and educators may want to consider this outlet first when disseminating conservation messages or advertising new outreach activities.

Perhaps, the ideal foundation for conservation support is for people to value nature and to have a thorough knowledge of wildlife regardless of how far they live from a protected area or whether or not they have direct contact with species (Tisdell & Wilson, 2008). Unfortunately, protected areas in Thailand lack the budget, staff, and equipment to spearhead significant environmental education and conservation outreach activities (ICEM, 2003). However, increasing the connection between park staff and students through conservation programs at local schools, especially at the elementary level, would probably significantly increase knowledge and conservation awareness. One solution is to outsource these tasks to local NGOs.

In our study, people's encounters with protected area rangers in their village did not influence their wildlife knowledge or their feelings toward conservation. Villagers noted "teaching" as the second most important task performed by rangers after "checking for wildlife tracks." So, it appears rangers are making a serious attempt at teaching and communicating with villagers, but they are not effective. Teaching was a one-word response given in answer to the question and the category has multiple meanings based on individual interpretation, so we are not able to elaborate on the extent or detail of the teaching. Most likely they do not receive significant training in education and outreach. Additionally, our survey only quantified teaching that happened during encounters in villages and did not explore outreach rangers may participate in at schools or protected area visitor centers.

Stakeholders' attitudes toward protected areas are also often influenced by their relationship with protected area staff. Additionally, the goals of a protected area are more difficult to achieve if local community attitudes are antagonistic (Alexander, 2000; Nepal, 2002; Holmes, 2003). While overall attitudes toward conservation and rangers were positive, there was a vocal minority who did not like the park or rangers and wanted to hunt inside protected areas. Depending on the social standing of these individuals, they could influence others to ignore policies (Wood, 2000). It would be interesting to explore what proportion of local people with either positive or negative attitudes towards conservation might constitute a "tipping point" and influence the attitudes of the majority one way or the other. Unfortunately, there are little available data on poaching levels in different parks for comparison.

Andrade & Rhodes (2012) found that level of compliance with protected area polices (e.g. hunting) was significantly related to the level of community participation in the protected are decision-making process. Therefore, incorporating a more participatory approach in protected area management in Thailand could foster more positive attitudes even among the current minority who hold negative attitudes or where there is high disregard for hunting policies. While we did not directly ask villagers about poaching levels, some respondents

still commented about poaching or hunting in their area. Of the seven protected areas, the highest percentage of people that mentioned poaching was near DY. This highlights a need for stronger anti-poaching protection in this sanctuary.

It was encouraging that a large number of people thought wildlife should be conserved "for the next generation." They also mentioned the need for collaboration with protected area staff. However, each protected area has a unique set of circumstances that influence local stakeholders' impressions of staff and conservation. For example, in a 1990–1992 attempt to reorganize land use and resettle illegal land squatters, the RFD engaged in a military-led "Land Distribution Programme for the Poor Living in Degraded National Forest Reserves in the Northeast of Thailand" (or *Khor Jor Khor*) which resulted in waves of protests by 36 settlements of farmers (PYE, 2005). Citizens from the Northeast or with ties to the movement may be less cooperative speaking to protected area staff due to remnants of antagonistic feelings.

To gain rapport with villagers, rangers could start by asking how protected area staff can help with local problems. Nearly half of the respondents at HSAM and KYNP reported problems with wildlife, with the majority of complaints focused on elephants. Human-wildlife conflict may provide opportunities for park and conservation managers to positively and actively engage local communities in conservation and park management. This can be achieved by listening to the concerns and grievances of local stakeholders and working jointly with them to address the problems. In such a process, villagers also become an information resource for managers because they often are very familiar with the wildlife issues that cause human-wildlife conflict (CLARK *ET AL.*, 1996; RILEY *ET AL.*, 2002).

A solid foundation for conservation support is built on a positive connection between local people and wildlife as well as local people and protected area staff. We believe this can be improved upon in Thailand by increasing villagers' basic wildlife knowledge and incorporating a more participatory approach to protected area management. Wildlife knowledge can be improved if park officers make an effort to:

- Collaborate with NGOs and local schools to develop joint outreach programs or expand wildlife conservation programs, especially at the elementary school level.
- Train rangers in basic education and outreach teaching methods.
- Disseminate conservation messages on TV (specifically iTV).

Thailand protected area managers can move toward a more participatory approach to conservation management by:

- Making an effort to employ local people living around protected areas as patrol rangers or encouraging volunteer community members to participate in patrols.
- Asking village headmen to select at least one person from their respective villages to be direct liaisons with protected area staff.
- Inviting a liaison from every adjacent village to monthly meetings to keep communication open and involve local residents in decisions on management directions.
- Attending town meetings to give residents an opportunity to voice their questions and concerns regarding protected area and human-wildlife conflict.

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