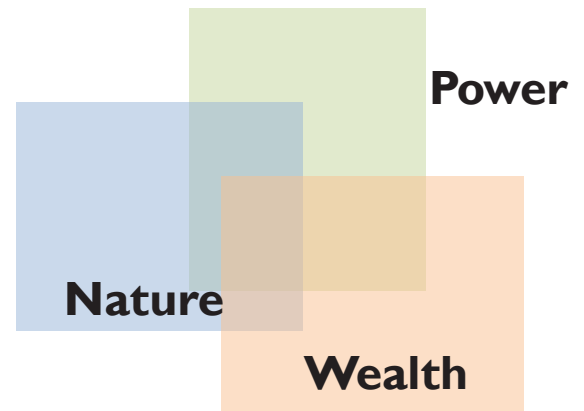


TRANSLINKS

Finding Linkages between Wildlife Management and Household Food Consumption in the Uplands of the Lao People's Democratic Republic *A Case Study from the Nam Et-Phou Louey National Protected Area*



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Introduction

Much of the biodiversity that remains in Lao People's Democratic Republic (hereafter called Laos) can be found in the rugged Uplands, a mountainous region covering the northern third of the country and running along its eastern border with Vietnam. Although the area harbors a rich fauna with numerous species of global conservation importance, most wildlife populations are at alarmingly low levels due to years of unregulated hunting and illegal trade. In this same area, poverty and malnutrition in the local communities, and limited opportunities for income, access to information or services, are persistent problems. In the traditional, shifting cultivation systems of the Lao Uplands, when population pressures were low, hunting was an indispensable part of local livelihoods and wildlife was an important component of local cuisine. Previous work (Krahn and Johnson 2007) has suggested that declines in wildlife consumption, as a result of overhunting and illegal trade, may increasingly be an important, but underestimated, determinant of the unbalanced, often vegan human diets observed in the area. Is it possible that more effective wildlife management holds unrealized potential for the recovery of wildlife populations as well as some degree of improvement in local livelihoods and household food security?

To recover and sustain wildlife populations, the Lao government is currently implementing two wildlife management approaches that have proven to be successful elsewhere: zoning and the distinction between hunted and

protected species. The National Forestry Law (GoL 2007a) mandates the establishment of *Totally Protected Zones* within National Protected Areas (NPAs) where hunting is prohibited, while the Wildlife Law (GoL 2007b) classifies wildlife into two groups: *Protected Species* that cannot be hunted because they are naturally rare and/or slow to reproduce and *Managed Species* that can be hunted during specific seasons and with specified weapons.



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Given the relatively recent implementation of these wildlife regulations in Laos there is little quantitative evidence of how this increased governance will impact the sustainability of wildlife offtake and, consequently, open opportunities for improved household food and nutrient intake. Thus, the aim of this case study was to test and refine the

methods for investigating linkages between wildlife management and household food consumption, following four main lines of inquiry (see Figure 1). The methods identified and tested by this case study can now be applied to a broader sample of villages to monitor change in these linkages over time.

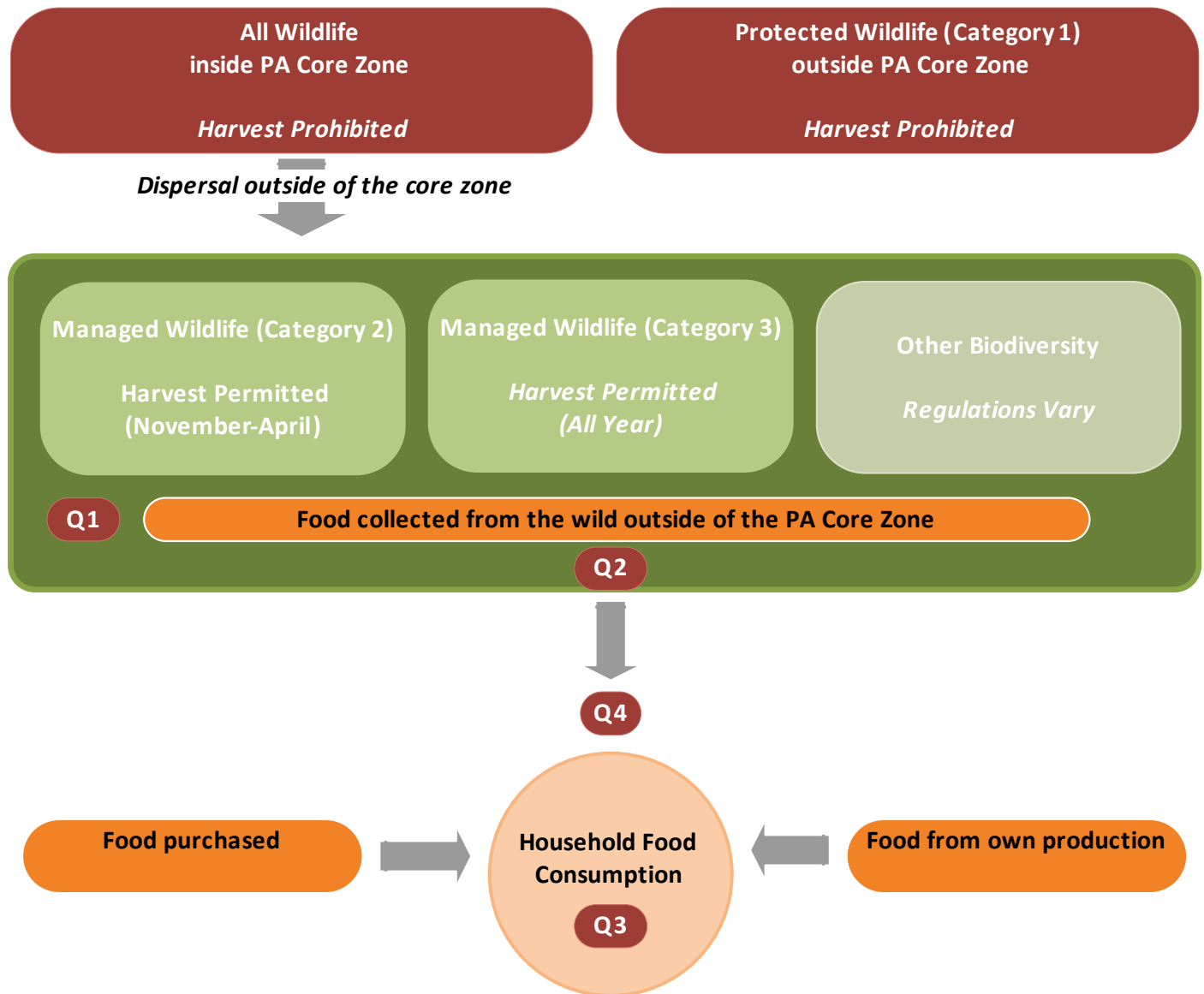


Figure 1. This diagram shows the three sources of food for household consumption: food collected from the wild; purchased food; and food produced by the household. It also illustrates the four broad areas of inquiry for which this case study tested investigative methods:

- Q1.** How does Protected Area management and village governance impact the abundance and use of managed wildlife species and other biodiversity?
- Q2.** What is the offtake of managed species and is it sustainable? If unsustainable, what mechanisms are needed to mitigate adverse impacts on biodiversity?
- Q3.** What is the adequacy of human nutrition? If inadequate, what mechanisms are needed to improve human nutrition?
- Q4.** What is the role of wild meat in household food consumption as compared to meat (and plant alternatives) coming from other sources - domestic production and the market?

Study Area

While the complex and multi-sectoral questions that this study has begun to investigate are relevant to all Lao protected areas, this case study was conducted in the Nam Et-Phou Louey (NEPL) National Protected Area (NPA) - an area of 5,950 km² of dry tropical mixed deciduous and evergreen forest in northern Laos. The people living in the 98 villages bordering the NPA core zone – many of them from non-Tai ethnic groups – engage in rapidly changing subsistence livelihoods with little access to, or integration in, the market economy. This preliminary study focused on Houey Dtern, a village of 39 families from the Mien ethnic group located in Viengthong District, which the government identifies as one of the poorest districts in the country.

Methods

Background information on hunting and household food consumption in villages around the NPA, collected from representatives from local government, NEPL management and four local ethnic groups during a February 2009 workshop, guided the design of the investigative methods. Participants confirmed that a wide range of wild foods are customarily eaten, as they are easy to access and free of charge. Wild foods are collected and cooked at three different locations: in the village; at semi-permanent shelters in livestock grazing areas; and at forest camps. They reported steady declines in wildlife populations over the last 20 years with some evidence of recovery since the start of NPA management in 2000.

From this information, several quantitative and participatory instruments were designed to gather information on trends in wildlife management and household food consumption. From May to August 2009, a university-trained coordinator fluent in the Mien language and two literate field assistants (1 male and 1 female) lived with two families to test the following quantitative tools:

1. **Household Profile Form.** To assess each family's demographic and socio-economic data, the latter as proxy indicators for household wealth.
2. **Household Weighing Record.** To record total food intake per family per day (based on records of all meals and snacks).
3. **Household Wildlife Form.** To quantify the harvest of wild mammals, birds and reptiles per family per day.
4. **Village Wildlife Form.** To opportunistically monitor the offtake of wild mammals, birds and reptiles by other families in the village.
5. **Household Food Collection Sites Form.** To determine the size of each family's wild food collection/capture area ("catchment area").

6. **Household Livestock Slaughter Form.** To monitor the slaughter of domestic livestock per family per week.
7. **Household Income and Expenditure Form.** To record weekly food and non-food expenditures and to collect pre-categorized income data.

The pilot study also incorporated participatory methods to assess the following:

1. **Trends in Food Consumption.** To document villagers' perceptions of changes in consumption (volume) of various food items over time.
2. **Trends in Food Sources.** To record villagers' perceptions of proportional changes in sources (domestic, wild, purchased) of food (such as meats, vegetables, fruits, rice) over time.
3. **Trends in Abundance and Offtake of Wildlife.** To compile villagers' perceptions of changes in the relative abundance and offtake of wildlife over time.
4. **Trends in Governance of Wildlife Offtake.** To document villagers' perceptions of changes in household and village rules governing wildlife offtake over time.
5. **Perceptions of Nutritional Value.** To record villagers' perceptions of the nutritional value of various food items, especially between wild and domestic foods.
6. **Taste Preference.** To compile villagers' taste preference for food items, especially between wild and domestic foods.

Results

Overall, the research team was able to effectively use the methods developed to gather the data needed to answer the questions posed, although some modifications are recommended for future studies. Data from Household and Village Wildlife Forms allowed the identification of individual animals to genera, and many cases species, as well as the determination of their age class and sex. The Wild Food Collection Sites Form proved to be sufficient for mapping collection locations and habitats, data which was used to estimate the "catchment area" from which animals are collected. Together, these provided the baseline data needed to estimate the annual offtake of individuals per km², although it will be necessary to employ these methods over a minimum of one year to accurately estimate total wildlife offtake across seasons of varying hunting intensity.

Data on illegal offtake of wildlife are essential for estimating total offtake. While such data are difficult to obtain, opportunistic observations on the Village Wildlife Form can be useful for understanding the occurrence and frequency of illegal offtake. Before implementing this study

with more households and villages, education aimed at increasing the local knowledge of wildlife regulations, and providing background information on human nutrition and the study's objectives (potentially targeted towards women), may help to ease the existing anxiety about reporting on wild food collection.

Data from the Household Weighing Record was instrumental in understanding the adequacy of each family's food and nutrient intake and the role of wild foods relative to other food sources, although it required intensive and skilled supervision to administer. Analyses of the results suggest that sufficient data to answer these questions could potentially be obtained by weighing all foods for only one week per month, while continuing to weigh the volume of meats, plant protein alternatives and eggs each day. Sufficient data on household income and expenditures, used to better understand sources of cash income and purchases of meat/meat alternatives, could likely be gathered using a one-week recall method, or derived from a national data set, rather than recorded daily.

A total of 549 meals were recorded between May and August for the two families. The results indicated that food and nutrient intake was suboptimal and the food group ratios were unbalanced. The diets were highly rice-biased, low in calories and fat and mainly vegan. Over two-thirds (67%) of the meat and nearly half of the vegetables were collected from the wild. The majority (61%) of the total reported volume of wild animals harvested by the two families during the three-month period came from small-bodied mammals (<1 kg in size), followed by fish (30.2%). Overall, the two families were found to have low levels and diversity of income and expenditures with high reliance on natural resources for many aspects of their livelihoods.

The difference between the results compiled from the quantitative household records and those obtained using participatory, and therefore subjective, methods highlights the necessity of quantitative data collection to fully answer the research questions, since in some cases reported villager perceptions differed markedly from the quantitative data recorded.

Conclusions

Results from this case study suggest that wildlife is a fundamental part of household food consumption in the Uplands. Therefore, managing wildlife for sustainable use is crucial not only for the conservation of biodiversity, but also may have a powerful impact on preventing malnutrition and

reducing poverty in remote areas over time. The results of this study highlight the importance of further investigation on the linkages between household food consumption and wildlife management across a wider range of villages of various ethnic groups. Information obtained from such investigation will be essential for engaging actors from multiple sectors in a holistic approach that addresses human dietary inadequacies while managing landscapes for wildlife conservation and sustainable offtake. If left unaddressed, increasingly vegan diets, low nutritional knowledge and a lack of opportunities to source meat (and plant-based protein alternatives), together with limited legal income opportunities, will likely hamper the acceptance and effective implementation of wildlife management regulations over the long term. The questions asked by, and methods derived from, this study are also relevant to extractive industries in rural Laos, where increasing investments in hydropower, mining, large-scale plantations and infrastructure warrant social and environmental assessments of how impacts on natural resources affect not only biodiversity, but also human livelihoods and nutritional well-being.

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To learn more about this preliminary examination of potential methods for investigating linkages between wildlife management, household food consumption and human nutrition, please read the full report, available from the lead author (ajohnson@wcs.org).

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