Environmental Impact Assessment

Prepared by the **Wildlife Conservation Society**

for the **Critical Ecosystem Partnership Fund**

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Project: **Emergency funding for the recovery of a globally significant population of critically endangered Siamese crocodile (Crocodylus siamensis) in Lao PDR.**

1. Policy, legal, and administrative framework

In 2010, Laos PDR acceded to the Ramsar Convention on Wetlands of International Importance (Ransar) and designated two Ramsar sites: Xe Champhone and Beung Kiat Ngong. The Xe Champhone wetland is located in two districts of Savannakhet Province: Champhone and Xonbuly.

Xe Champhone is the habitat of one of the few surviving wild populations of the Siamese crocodile (Crocodylus siamensis), a species which is protected under international and national law. The Xe Champhone Ramsar site is protected under the Ramsar Convention on wetlands; endangered species and specific aspects of the site are governed by other international agreements and by national sectoral law. Within the Xe Champhone Ramsar site, specific areas are under customary law protection and designated conservation areas in individual villages are protected under statutory village regulations (Moore *et.al.* 2013).

In a recent survey undertaken by IUCN at 11 villages in the Xe Champhone Ramsar site, 86% of respondents indicated For the most part local communities follow customary law rather than statutory law. Customary laws pertain to spiritually protected areas, sacred forests and lakes, cemeteries, and non-spiritual communal protected areas.

The statutory laws that generally apply to the Xe Champhone Ramsar site include, but are not limited to: the Constitution; the Land Law; the Law on Aquatic Animals and Wildlife; the Water and Water Resources Law; the Forestry Law; the Fisheries Law; the Environmental Protection Law; the Penal Law; and their implementing decrees. The implementing decrees for most of these laws establish detailed rules that apply to specific uses of natural resources. There is no specific law enacted by the National Assembly to regulate the Xe Champhone Ramsar site.

2. Project Description

The project will be implemented in the Xe Champhone (XC) wetlands (16°23'N, 105°13'E), located in eastern Savannakhet Province, Lao PDR. This extensive wetland is recognized in the CEPF ecosystem profile as Key Biodiversity Area LAO40.

The XC wetlands are a large floodplain area, part of one of the key river basins connected to the Mekong River, the Xe Banghieng River basin. It is one of only two Ramsar sites in Lao PDR designated by the government in September 2010. The 12,400ha wetland is a mosaic of different wetland types, comprising perennial and seasonal rivers, freshwater lakes, oxbows,

marshes, mixed bamboo forest and rice paddy fields. These become interconnected during the wet season as water levels rise, providing important habitat and migration pathways for fish and other freshwater species, while in the dry season many parts of the wetland are isolated

The Siamese Crocodile (*Crocodylus siamensis*) is considered one of the most threatened crocodilians in the world. Although formerly widespread and abundant throughout much of Southeast Asia, populations of *C. siamensis* have precipitously declined during the past 50 years as a result of widespread habitat destruction, over-collecting to stock crocodile farms, and illegal hunting for skins and meat. Extant wild populations apparently no longer survive in Vietnam, and remnant populations of questionable viability remain in parts of Cambodia and Thailand. Little information is available from Malaysia and Indonesia; *C. siamensis* appears to be extinct in Peninsular Malaysia and Java, although a small, genetically distinct population persists in a single river system of Kalimantan.

The Siamese crocodile is currently recognized as Critically Endangered ("severe decline in numbers and area; >80% decline in three generations") by the IUCN and included in Appendix I of the Convention on International Trade in Endangered Species of Fauna and Flora. Without immediate aggressive conservation action, wild populations of Siamese crocodiles will likely disappear within the next 20 years. The recovery of wild populations has been accorded the highest priority by the IUCN/SSC Crocodile Specialist Group.

In Lao PDR, potentially viable, albeit fragmented populations of *C. siamensis* are known only from Attapue, Salavan, and Savannakhet provinces. On the basis of recent observations by local people acknowledged as the most familiar with crocodile occurrence in the Ramsar listed XC wetlands in Savanakhet Province, a minimum of 75 crocodiles was estimated. Considering the critically small population of this species remaining in the wild globally, the remnant populations of *C.siamensis* in Lao PDR, and particularly in the XC wetland complex are of global significance.

The WCS Lao PDR Program has been working with the government of Lao PDR and local communities in the XC wetlands since 2008. Currently we are implementing the third phase of the multifaceted Community-based Crocodile Resource Management Project (CCRMP). In Phase 1, in May-June 2008, surveys of crocodiles, associated wetlands and rural livelihoods were conducted in western Savanakhet to assess crocodile recovery potential (Cox and Phothitay 2008). Phase 2 also included two rounds of village discussions to obtain local input to a CCRMP plan (Hedemark et.al. 2009). During Phase 3 we have improved wetland management through zoning of specific crocodile conservation zones with accompanying regulations, reinforced the crocodile population through a head-starting program, raised awareness of crocodile conservation in key communities, established community based organizations that implement management actions known as Village Crocodile Conservation Committees (VCCC), and monitored crocodile presence and distribution.

A particular success of the current Phase of the CCRMP has been the head-starting program. Given the global status of the species, the suitability of habitat at the site, the low number of fertile nests at the site, the threats to Siamese crocodile eggs, and the difficulty in protecting nests, project partners decided that the most appropriate strategy for increasing Siamese crocodile numbers at the site was to implement head starting. The IUCN Crocodile Specialist Group recognizes that sites in Lao PDR require augmentation of reintroduction if populations are to be viable (Simpson and Bezuijen 2010). To do this our team conducted nest searches on

an annual basis during the breeding season. Once a nest was located the eggs were carefully collected and incubated until they hatch. Hatchlings are then reared until they are of sufficient size and health to return to the wild (usually around 18-20 months). To return hatchlings to the wild we place them in a semi-captive environment for up to five months (soft release) so they develop hunting skills and imprint on the area. All methods for collection, incubating, rearing, and release are developed and overseen by members of the IUCN Crocodile Specialist Group.

To date the project partners have successfully released 19 juvenile crocodiles back into the XC wetlands. Currently in the head-starting program we have a further 46 individuals from clutches of eggs hatched in 2012 (21 individuals) and 2013 (25 individuals). It is expected that these individuals will be of sufficient size for release in the XC wetlands in August 2014 and September 2015 respectively. Combined these individuals represent a significant proportion of the population of Siamese crocodiles in both Lao PDR and globally. To successfully achieve their safe release to the XC wetlands requires continued funding for feeding and housing as well as monitoring, health checks, and collection of growth data. This work is primarily done by the VCCC located at Than Soum village in the XC wetland area supported by WCS specialists and staff. The Lao Zoo also provides technical assistance and support.

Thus far the CCRMP has received exclusive funding from the private sector although the current round of funding ended in December 2013. This funding was provided by the MinMetals Group who operate a gold and copper mine in Savannakhet province. The MinMetals Group has previously suggested they were committed to funding a fourth phase of the program which including ongoing costs for the head-starting program. In November 2013 WCS was informed that the company would no longer support the CCRMP, likely due to a downturn in gold prices on the global markets. Following this the company made verbal commitments to specifically fund the ongoing head-starting program to ensure the safe release of these 46 remaining individuals and completion of this component from Phase 3. However, on 31 December 2013 WCS was further informed that this pledge of support was to be withdrawn. There is now an emergency need to secure funds to ensure the successful completion of this component of the program.

As described above the project directly addresses the long-term prospects of Siamese crocodiles in Lao PDR by reversing population declines, and engendering community support for crocodile conservation. To accomplish these objectives, we implemented a multi-faceted community-based conservation program targeting key wetlands along the Champhone and Xangxoy river systems in Savannakhet Province of southern Lao PDR. These wetlands are thought to contain elements of a single interacting crocodile metapopulation linked by a riverine corridor.

The primary implementing party of this project at the site level is the community-based organization at each community, the VCCC. Thus far we have assisted 9 communities in the XC wetland area to establish these committees. Since their establishment the VCCC have provided significant input on the project design, adaptive management, implementation and monitoring. WCS's role is to provide technical advice, project coordination, reporting, financial management, and government liaison.

The project actions include the following;

1. Continued rearing of the remaining 46 individuals in the head-starting program. This includes provision of live prey and other food items (snails, eels, frogs) to ensure a varied diet. These food items are procured by the VCCC from the controlled use zones of the XC wetlands in accordance with local regulations. VCCC members also collect regular data to monitor the growth and weights on individuals in the head-starting program. WCS provides incentives to the local community for these services. To date this has included small direct payments to members of the VCCC to compensate for lost opportunity to engage in other livelihood activities. These payments are made on a daily input basis. In addition to this a community-based incentive is provided for wider benefit. This is negotiated with the local community executive and has included financial contributions to community infrastructure such as village school, office, and temple.
2. Continued technical inputs and monitoring of the head-starting program by both government and WCS staff. This includes monitoring visits to the site by WCS technical specialists and veterinarian. WCS staff will visit the site at least twice per month to liaise with the VCCC and assess project progress. WCS technical specialists will visit the site at least once every three months or as needed to further the successful completion of the program and monitor the health of the crocodiles. Local government personnel will attend all site visits.
3. Construction of a further rearing enclosure to house the crocodiles as their size increases. A rearing enclosure already exits at the Than Soum village although an additional enclosure is needed as the individuals increase in size and need to be divided into a smaller number of individuals in each pen. This enclosure is constructed by the local community according to specifications provided by WCS.
4. Construction of soft release pens in the wetland areas during 2014 and 2015. These pens are constructed of mostly local natural materials by the VCCC. WCS provides the design of the release pens and each can take up to one week to construct. At this time WCS anticipates the pens will be constructed in the Khout Mak Peo/ Pi Noy area at Than Soum village (Figure 1).
5. Release ceremonies during 2014 and 2015. Siamese crocodiles are both spiritually and culturally important to local communities. It is critical that local customs be respected and ceremonies conducted for each release of crocodiles. These events all build constituent support for the program since other communities from the area as well as local government also attend. The release timing of each cohort of crocodiles is dependent on their size and condition although we anticipate the releases will be conducted in August 2014 and 2015.

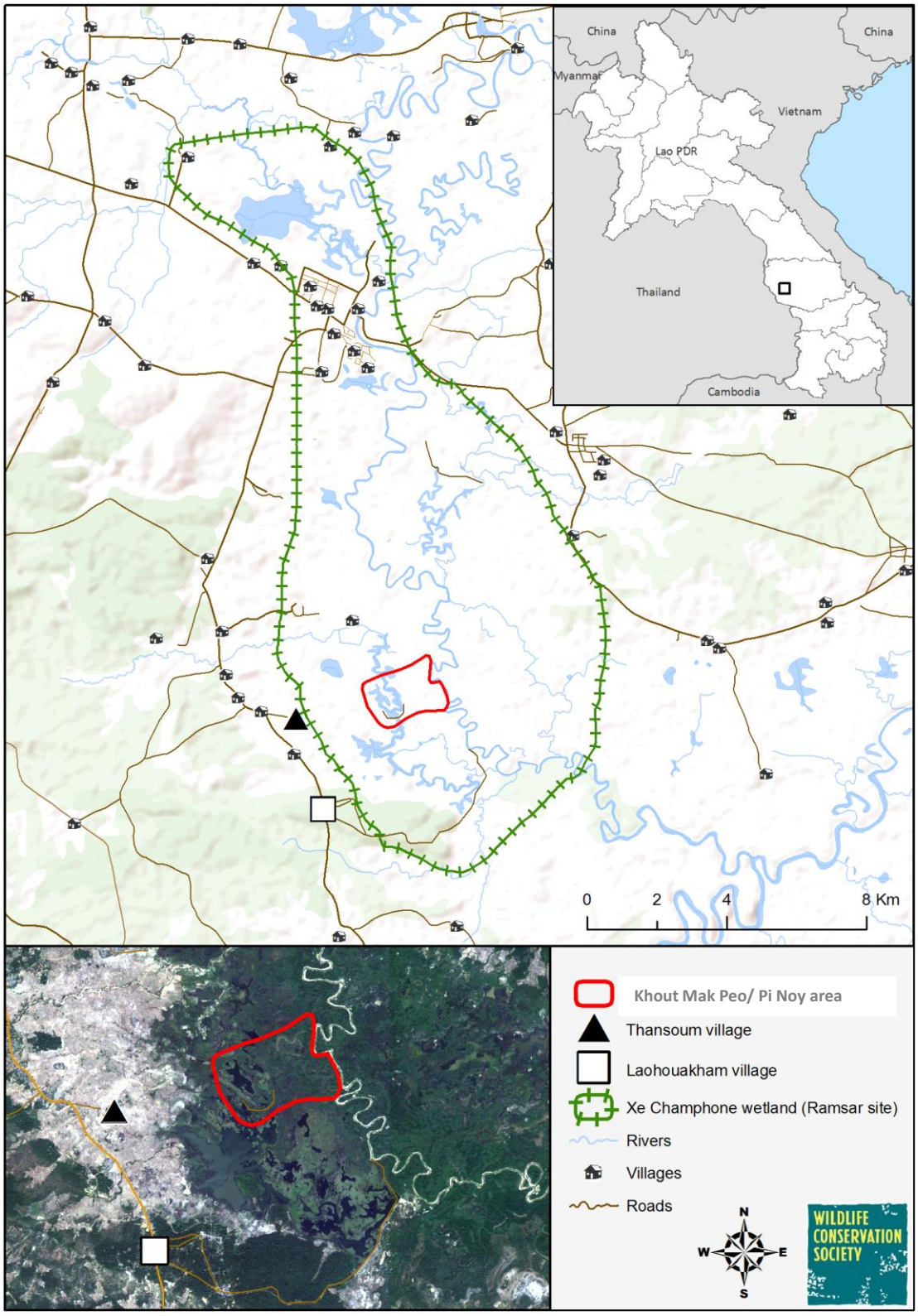

Figure 1. Map of the Khout Mak Peo (Latitude/Longitude: 16.3543°, 105.2032°) wetland area situated in the Ramsar listed Xe Champhone Wetland complex, Savannakhet Province, Lao PDR

The construction of the soft release pens in point 4 above are the subject of this EIA as it triggers the CEPF Safeguard Policy on Environmental Assessment.

The specific location of the soft release pens is yet to be determined. WCS will consult with both the local community at Than Soum village and the district government representatives from the District Office of Natural Resources and Environment to determine the most appropriate location in accordance with customary and statutory law. Nonetheless WCS expects the location will be almost identical to that where the soft release pen was situated on the edge of the Khou Pi Noy marsh for the release of crocodiles from the head starting program on 19 March 2013, 16°21'1.99"N, 105°11'58.90"E (Figure 2). Given consultation with local community and government, the location will not impact any site of environmental, cultural or spiritual importance.

Figure 2. Location of the soft release pen at Than Soum village.

Local community members from Than Soum village will do the construction of the soft release pen. The materials used to construct the pen are limited to bamboo, sourced from Than Soum village lands, and polyester netting. The pen will be approximately 4m in length and 3m in width. An example illustrating the design is provided in Figure 3.

A fence made of bamboo is erected in a rectangular formation (4m x 3m) with stakes driven into the mud below the waterline. Following the a polyester met is placed to line the inside of the pen with the bottom edge buried in the mud below the waterline. A small walkway, approximately 5m in length, is then built from the land to edge of the pen to facilitate access. This walkway is also made of bamboo sourced from Than Soum village lands. A small amount of vegetation, mostly *Mimosa pigra* and sedge grass, will be cleared to facilitate the landing of the walkway

Figure 3. Soft release pen constructed for crocodiles released in March 2013.

3. Baseline data

The Xe Champhone wetland area is a very complex mosaic of habitats, all modified to some extent by human activity. The most visually obvious are numerous large reservoirs, created apparently largely to supply irrigation water to surrounding agricultural land. Large thick floating mats of graminoids have established themselves in all of the large reservoirs and the aquatic vegetation (e.g. larger non-woody macrophytes) is at least comparatively as rich as the researcher has observed in any natural Indochinese wetlands (Timmins 2014). Despite this the area in which the soft release pens are to be constructed are not known to contain any vulnerable, threatened or endangered species of plants. A biodiversity survey conducted by IUCN in late 2013 identified the wetland bird community as significant nationally but certainly not significantly more important than similar communities at a number of sites nationally (IUCN 2014). Despite this the small area where the soft release pens will be situated is not known to contain significant habitat or breeding areas of any vulnerable, threatened or endangered species of animals including fish.

4. Environmental Impacts

WCS does not anticipate any significant changes in the local ecology or species composition as a result of the construction and use of the soft release pens. Bamboo wil be sourced from areas nearby and within the boundaries of the Than Soum village area where the species is abundant. A small area 2x2m will be cleared for the walkway landing. It is expected that the area cleared will regenerate naturally following the dismantlement of the enclosure following the completion of its use. There will be some disturbance to the wetland substrate during the construction of the soft release pens but it is not expected to significantly increase turbidity or water flow regimes in the large water body of the Khou Mak Peo / Pi Noy area.

5. Analysis of alternatives

WCS considers the current design of the soft release pen as the most suitable for the intended need and with the least amount of environmental disturbance. The alternative is to conduct a hard release of juvenile crocodiles but the is not advisable given hard release of other reptiles such as turtles has shown greater dispersal from the release area.

6. EMP

6.1.1.Mitigation

WCS will supervise the construction of the soft release pen to ensure that the agreed design of the pen is followed and that all waste materials, likely to be strips of polyester netting, are disposed off appropriately in waste disposal areas in the Than Soum village residential area. Further to this WCS will monitor and supervise the maintenance of the pen to ensure no unnecessary disturbance to either the wetland environment or species.

Following the completion of the action, final release of the crocodiles from the pen to the wetland area, WCS will supervise the dismantling of the soft release pen ensuring that the polyester netting is again disposed of appropriately.

6.1.2.Monitoring

WCS will conduct monitoring one time per month throughout the duration of us of the soft release pen. During monitoring WCS staff will assess the condition of the pen and noting any adverse conditions that could affect the environment in the wetland. Any issues will be reported to the Village Crocodile Conservation Committee and resolution shall be discussed with the relevant district government authorities, the District Office of Natural Reseources and Environment.

6.1.3.Capacity development and Training

During the construction of the soft release pen in January 2013 WCS conducted a meeting in which the design of this type of pen were discussed. No further capacity development and training regarding it's construction are considered to be needed at this time.

7. Implementation Schedule and Costs

The soft release pen will be constructed in March 2014 and we estimate the total cost to be USD 500.

Appendixes

Contributors

This EIA was prepared by Alex McWilliam, Deputy Director, WCS Lao PDR Program.

References

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