REPORT ON CEPF'S SAFEGUARD POLICY ON PEST MANAGMENT REGARDING *MIMOSA PIGRA* CONTROL IN BOEUNG PREK LAPOUV SARUS CRANE RESERVE IN BOREI CHULSA AND KOH ANDET DISTRICTS, TAKEO PROVINCE

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For WWT full proposal
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The Critical Ecosystem Partnership Fund is a joint initiative of l'Agence Française de Développement, Conservation International, the Global Environment Facility, the Government of Japan, the MacArthur Foundation and the World Bank. A fundamental goal is to ensure civil society is engaged in biodiversity conservation.

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1-SUMMARY

The control of invasive species in Boeung Prek Lapouv (BPL) has always mainly focused on the Giant Mimosa *M. pigra* which is spreading into the core conservation area and could have significant negative impact on the ecology of this wetland. Therefore work to control this invasive species measures have been undertaken since 2007 until the present time. The total treated areas so far over the six year period is equal to 478.2 hectares. The areas where control efforts have taken place are mostly along the riparian zone of irrigation canals, streams and rivers in and around the core zone. In late 2013 & early 2014 (after the CEPF project ended), it was not possible to undertake removal work as there was no available budget..

Control of *M. pigra* is attempted by first removing all seed pods from plants and then cutting the main stem at the base by machete. This is done as water levels are rising, immediately prior to the 3 – 4 month period of deep flooding. Immediately following the flood period the same area is re-cut to further weaken any surviving plants and prevent regrowth and seed production.

Another invasive plant present in and around the core area is *Ipomoea rubens*. This vine is spreading rapidly and smothers other plants, especially woody vegetation such as *Polygonum tomentosum*. *I. rubens* was removed from an area of 0.57 ha in 2009 as a trial. This work has not been continued although it is recommended to include this species in future efforts to control invasive species.. Water Hyacinth *Eichhornia crassipes* numbers need also to be reduced to allow boat access and to benefit native aquatic flora, such as Water Lily *Nymphaea sp*. For the forthcoming phase of work to be undertaken at BPL, the local community will be engaged and participate in this process through the wider engagement strategy for the whole project to be developed by the WWT team. This will ensure local knowledge and expertise is accessed and informs conservation planning and management.

2-MATERIALS

Equipment and materials are used for the *M. pigra* control including:

- Thick canvas gloves
- Bush knives (machete)
- Pruning scissors
- Masks
- Large plastic bags
- Raincoats

3-CONTROL METHODS

The first round of *M. pigra* control is conducted as flood waters begin to rise, sometime between June and August. The method used follows that which has been effectively used in Tram Chim National Park and elsewhere whereby plants are cut at their base, with subsequent flooding reducing the capacity of the plants to regenerate and survive the cutting (van Zalinge 2006). This method has resulted in 75-90% mortality of plants in Tram Chim (Nguyen Hong Son *et al.*, 2004; Nguyen Thi Lan Thi *et al.*, 2004). Before cutting the main stems all seed pods are removed and later transported off site for burning and disposal. Another round of cutting is normally repeated after the floodwaters have receded in December or early January in order to cut back stems, which survived the first treatment, but do not yet bear fruits. The LCG was trained in this method by Dr. Tran Triet of the International Crane Foundation, who had previous experience on invasive species control in Tram Chim as described above. Local people are hired to conduct the work and supervised by the LCG. One treatment is not normally sufficient to prevent re-growth and so any areas controlled prior to flooding will usually be treated again as floods recede and re-growth occurs

To improve monitoring of the efficiency of *M. pigra* control, in 2011 assessment of plant regrowth was incorporated in to the program (Annex A). During the first pre-flood treatment the LCGs place 16 square

meter quadrats randomly in the treatment area and count the number of plants cut within each quadrat. The quadrats are replaced with wooden pegs and string to demarcate the quadrat area. This demarcation started in 2012. In 2011 only the GPS coordinates of quadrats was recorded, but given GPS accuracy to around three meters, this was not found to be accurate enough. Quadrats are then revisited during post-flood treatment and both, the number of cut stems that show signs of regrowth and the number of new plants growing within the quadrats are counted. This allows us to calculate average mortality of plants following the cut & flood treatment and average overall regrowth within treated areas. See Annex 2 for an example of the datasheet used for monitoring the Giant Mimosa control work in BPL.

Local community members are hired to carry out *M. pigra* control under daily supervision of the LCG. Before the control work is started, a short training session on methods is provided by LCG members or project manager and equipment and materials are distributed. Working hours are from 8:00-11am in the morning and 1:00-4:30pm in the afternoon.

4-LOCATIONS AND SIZE

Areas to be controlled can only be identified in the immediate aftermath of the rainy season as this provides for ease of access by boat to the worst-affected areas and also because areas of re-growth can only be identified as floodwaters recede.

5-CEPF'S SAFEGUARD POLICY ON CONTROL OF INVASIVE PLANTS

M. pigra control is implemented by cutting its seed pods and stems without chemicals as described above. Similarly, attempts to control other invasive plants (as identified above) will also be undertaken without chemicals.This means that we are able to precisely focus attempts to control and even eradicate target species whilst protecting water quality, human health and wetland/aquatic biodiversity.

Annex A: Example of data entry sheet used for Giant Mimosa control work

M. PIGRA CONTROL DATA COLLECTION SHEET

Name of Officer _____ **Date** _____ **Plot ID** _____

GPS used: WWT (new) ☐ **BirdLife (old)** ☐

Waypoint numbers for mapping control plot: _____ **to** _____

WP	UTM (E)	UTM (N)	WP	UTM (E)	UTM (N)	WP	UTM (E)	UTM (N)

Density of plants (count number of living stems within quadrates of 1m^2)

A. Pre-flooding ( ):

Quadrate	Number of living stems	Central Location	
		Long (E)	Lat (N)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			

B. Post-flooding ( ):

Quadrate	Number of living stems	Number of new growths
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		

INSTRUCTIONS

Record:

- Name of person filling in the form
- Date of treatment (day/month/year)
- Assign an ID for the treatment plot (e.g. alphabetical or numerical). Make sure to give a different name to each new block and that the same name is used again every following year to identify the treatment area (even if it increased or decreased in size).
- The range of numbers automatically saved to the GPS when mapping the boundaries of the infested area that is being treated (e.g 11-65).
- Identify the GPS used when mapping the treatment plot (choice of the WWT or BirdLife GPS)
- Describe the treatment and disposal method, e.g.:
  - Cutting mature fruits first and put in the plastic bags
  - Then cutting plants at base of stem, as close to the soil surface as possible
  - Keep the cut fruits in one prominent location until being dry and then burn by adding some gasoline.
  - Ashes are gathered to put in a pit and cover with soil.
- Count the number of living stems within $1m^2$ quadrats. This is achieved most easily immediately following treatment. Collect 16 random samples within the treated area and record sample location with a GPS. Try to ensure a maximum accuracy reading. Place sticks in ground at corners of quadrat and tie bright coloured string between sticks. Revisit same locations post flooding, around January and count the number of living stems within the 16 random samples of quadrats, before re-treatment.
- Completed forms to be collected by LCG/Field officers and data entered onto computer by Phnom Penh WWT office staff
- Annual report including review of effectiveness and recommendations for future work produced and disseminated by WWT.