

# Management Plan for White-eared Night Heron at Ba Be National Park 2013 – 2017



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## List of Acronyms

BBNP	Ba Be National Park
BBFC	Ba Be / Na Hang Limestone Forest Complex
MoST	Ministry of Science and Technology
PRCF	People Resources and Conservation Foundation
VAST	Vietnam Academy of Science and Technology
WENH	White-eared Night Heron

## **1. Introduction**

### **1.1. Background**

In 2008 three adult White-eared Night Herons were observed at Ba Be National Park (BBNP) and in subsequent years more birds were observed with nesting pairs observed from 2009 to 2011, identifying the site as a significant conservation hotspot for the species. This discovery has generated considerable excitement within the ornithological community, especially as BBNP and one site in the neighboring Xuan Lac commune, represents the first confirmed reports of the species in Vietnam since 1975 when a specimen was collected by Vo Quy in Hoa Binh province (Pilgrim *et al.*, 2009). Amongst a network of conservationists interested in conserving the species in Vietnam, there is strong support to commence community-inclusive conservation initiatives at BBNP to conserve the species, its critical habitat and manage threats.

The White-eared Night Heron (WENH) Management Plan at BBNP has been prepared by the People Resources and Conservation Foundation (PRCF) in consultation with BBNP technical staff, ornithologists and local people interested in the conservation of WENH. The management plan considers requirements of the species within the reserve and not elsewhere throughout its known range (although information on the species gathered from observations made elsewhere in Vietnam and China is included). It identifies current and potential threats and actions to ensure the short to medium term viability of the species within the national park and the parties who will undertake these actions. Attaining the objectives of the management plan is subject to budgetary and other constraints affecting the parties involved.

### **1.2. Goal of the Management Plan**

Define a short to medium term conservation plan to conserve, manage, and improve understanding of the ecology and behavior of *Gorsachius magnificus* within Ba Be National Park

### **1.3. Objectives of the Management Plan**

- Define critical habitat (current and potential) to target conservation management initiatives.
- Identify threats and threatening activities to the species and its associated critical habitat.
- Identify management issues within BBNP that may impact on WENH and its critical habitat.
- Define management actions and responsibilities of key stakeholders to implement them.

## **2. Legislative Context**

### **2.1. International Conservation Status**

Because of its estimated small and fragmented population, and inferred declines caused by forest clearance and fragmentation, the species is categorized as a globally Endangered C2a (i) species under the IUCN Red List (Birdlife International, 2012b). The C2a criteria refers to as follows:

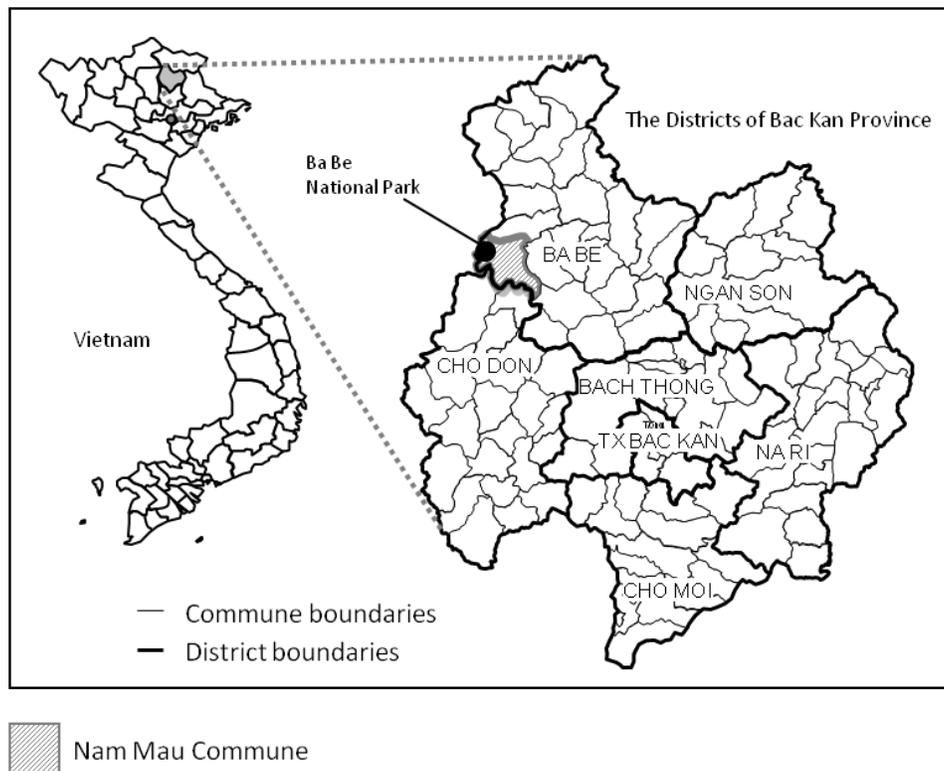
- C. Population size estimated to number fewer than 2500 mature individuals.
2. A continuing decline, observed, projected, or inferred, in numbers of mature individuals:
  - (a) Population structure in the form of one of the following:
    - (i) no subpopulation estimated to contain more than 250 mature individuals.

## 2.2. Vietnam Conservation Status

The species is listed in the Vietnam Red Data Book as Critically Endangered (MoST and VAST, 2008), however, has not been listed as a protected species in Vietnam under Decree 32/2006/ND-CP (Management of Endangered, Precious and rare Species of Wild Plants and Animals) or other relevant legislation or policy decisions.

## 3. Ba Be National Park

BBNP covers 10,048ha in Bac Kan province in northern Vietnam and is centered around Ba Be Lake. The national park is divided into a number of conservation land use area categories including strict protection, natural regeneration and administrative zones (BBNP, 2009). In addition, the park contains land that is used for agricultural and habitation purposes by approximately 3,559 people (613 households) from 11 villages permanently residing within its boundaries (Ba Be district Statistics Office, 2010). Nearly half the population of the Nam Mau commune is considered to be “poor” (declared a Program 30a<sup>1</sup> commune). Most village households have insufficient access to agricultural land to sustain themselves on a year-to-year basis (Ba Be district Statistics Office, 2010).



**Figure 1:** Location of Ba Be National Park (Adapted from Zingerli, 2001)

<sup>1</sup> The commune has been declared a Program 30A location by the Ministry of Labor, War Invalids and Social Welfare under Decision 30/A/2008/NQ-CP dated 27<sup>th</sup> December 2008 to address poverty reduction in the 61 poorest districts in Vietnam.

## 4. Species Information

### 4.1. Description

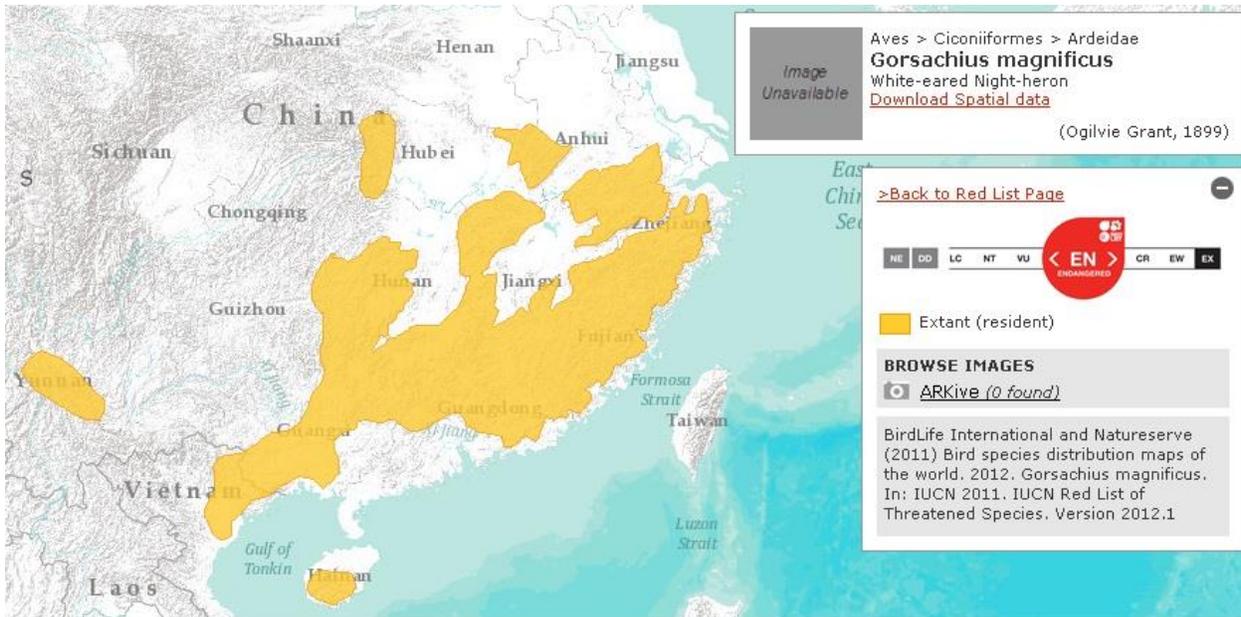
The adult WENH is a medium sized bird, with male and female approximately the same size and reaching up to 54-56 cm in body length. Males have blackish head and nape plumes, white post ocular stripe, cheek-stripe and throat, broad blackish lines down neck side, brown undersides with whitish streaks/scales and orange-buff to rufous-chestnut rear neck sides with yellow legs and feet (BirdLife International, 2012).

Females have a less distinct head and neck pattern, whitish streaks and spots on the back and wings (particularly wing-coverts) and shorter nape plumes. A juvenile resemble females, but has dark parts of plumage browner and has heavier whitish to buff spots above (BirdLife International, 2012).

### 4.2. Distribution

Globally the distribution of WENH is poorly known and appears to be rare and patchily distributed across a relatively wide range restricted to southeast southern China and northern Vietnam (Pilgrim *et al.*, 2009; Stattersfield *et al.*, 1998). In south-east China the species was known from c.20 localities in 2001, however, after an extensive survey effort and increased awareness a further 30 new localities have been recorded (He Fenqi *et al.* 2011). There are now records in twelve Chinese provinces including Hunan, Hubei, Zhejiang, Anhui, Jiangxi, Guangxi, Xinping, Guangdong, Yunnan, Fujian, Guizhou and Sichuan provinces (BirdLife International, 2012).

During the past 30 odd years in Vietnam, the species has been observed in five northern provinces (Hoa Binh, Bac Giang, Quang Ninh, Bac Kan and Tuyen Quang) (Fellowes *et al.*, 2001; He Fen-qi *et al.* 2007; BirdLife International, 2001; Le Trong Trai *et al.*, 2001; Nguyen Cu, 2008). In the past decade, however, WENH has been recorded at six locations in the north eastern provinces of Bac Kan and Tuyen Quang: 1) Ly and O villages, Xuan Lac commune, Cho Don district, Bac Kan province (Le Trong Trai *et al.*, 2004; Pilgrim *et al.*, 2009; Dine *et al, in litt*); 2) Border between Con Lon and Khau Tinh (Pac Vang) communes, Na Hang Nature Reserve (Tat Ke sector) Na Hang district, Tuyen Quang province (Nguyen Cu, 2008; Dine *et al, in litt.*); 3) Son Phu commune (Ban Lam), Na Hang district, Tuyen Quang province; 4) Nang Kha commune, Na Hang district, Tuyen Quang province; 5) Thuong Lam commune (Chom), Lam Binh district, Tuyen Quang province (PRCF, 2012); and 6) Nam Mau commune, Ba Be district, Bac Kan province 2008 – 2012 (various observers including Pilgrim *et al.*, 2009; Eames & Le Manh Hung, 2009; Le Manh Hung, 2011; Michael Dine, *Pers comms.*, 2010 - 2012).



**Figure 2:** Map depicting the estimated world distribution of WENH (Birdlife International, 2012b)

### 4.3. Habitat

The WENH is a forest species found in tropical to subtropical forest areas (BirdLife International, 2012a). Within the scientific literature, there are numerous recorded observations of WENH living and nesting in close proximity to human habitation suggesting that the presence of pristine habitat may not be essential for the species (BirdLife International, 2012a).

Optimal habitat for the species appears to be primary riparian forest (broad evergreen forest) with adjoining rice fields, marshes, mud flats and slow-flowing streams that constitute good foraging areas (Fellowes *et al*, 2001). Field observations made at BBNP by multiple researchers (Eames & Le Manh Hung, 2009; Pilgrim *et al*, 2009; Huong Van Chat and Michael Dine both *Pers. comms.*) appear to confirm this habitat categorization.

Known nesting sites within BBNP include riparian forest adjacent to Bo Lu and Coc Toc villages and upstream on the Nang River from Ban Cam village. There is unsubstantiated information of the presence of nests near Luang Quang and Leo Keo villages in riparian forest along the Cho Len stream in the south east of the national park.

At a workshop held in 2011 with national park and PRCF staff, interested ornithologists and key local informants, three habitat types for WENH were defined at BBNP including foraging, nesting/breeding and non-breeding season roosting (PRCF, unpublished workshop minutes, 2011). It is unclear whether the latter habitat type represents a permanent location or is used seasonally by the species. However, information from local informants indicates that the species may stay in a localized vicinity to breeding/nesting sites during the non-breeding season. Further research is necessary to investigate this claim.

The three habitat types are defined as follows and are roughly mapped in Figure 2:

- 1) *Breeding/nesting habitat*: areas of riparian forest with large trees (up to 30m tall) where suitable sites for nesting are located.
- 2) *Foraging habitat*: areas of low-lying land subject to inundation and no greater than 20cm in depth including rice fields, marshes, alluvial mud flats and small streams.
- 3) *Non-breeding season roosting habitat*: Areas of forest that provide suitable areas for non-breeding season roosting and daytime retreats around 500m of nesting locations.

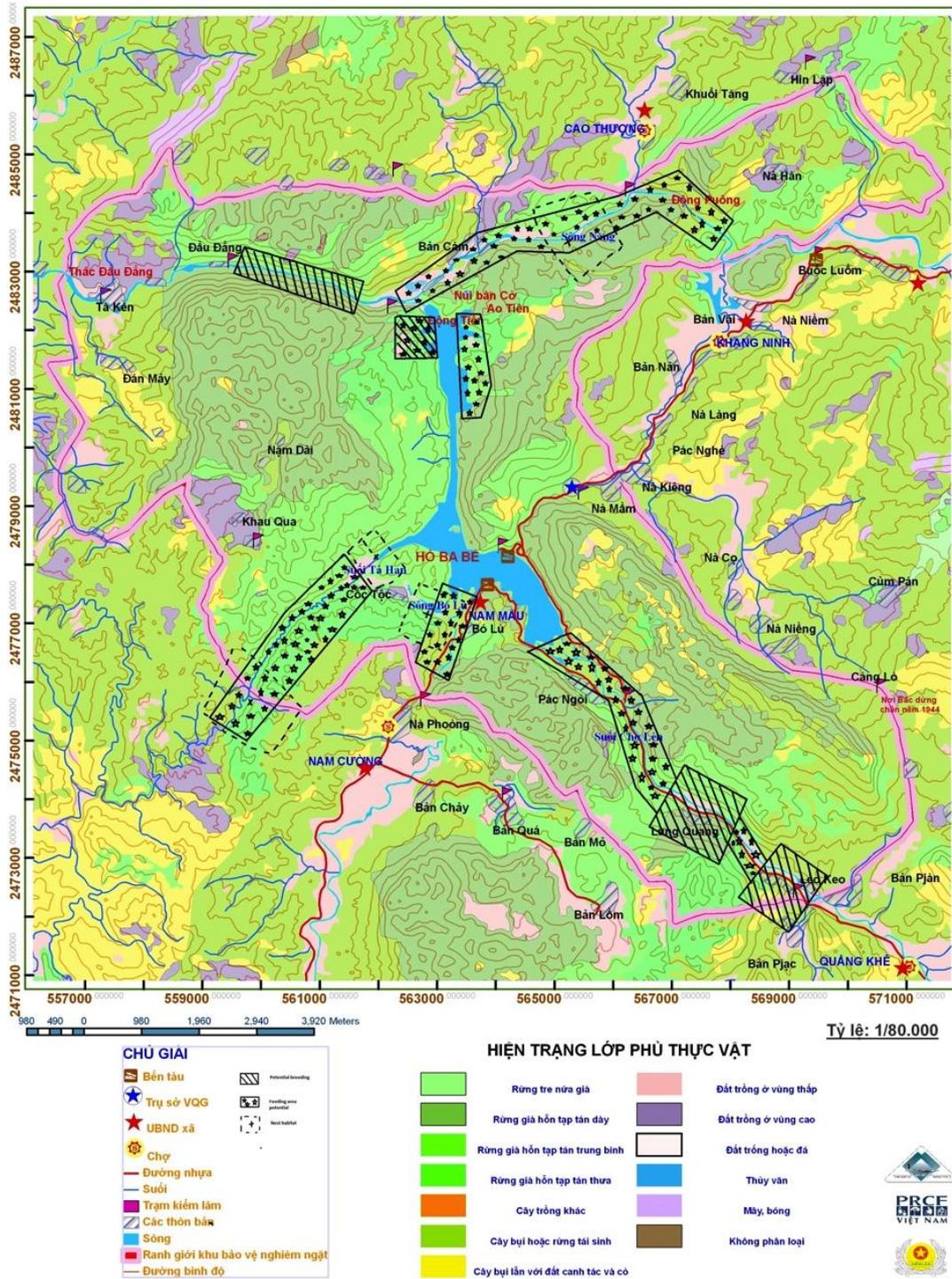


Figure 3: Location of potential habitat types for WENH within Ba Be National Park

#### **4.4. Life History and Ecology**

##### **4.4.1. Population Status and Dynamics**

Observations from the scientific literature suggest that due to the species' nocturnal habit and secretive nature, it is rather difficult to determine the population status of the WENH. The global population is estimated at c.250-999 mature individuals (BirdLife International 2001; M. Crosby *in litt.* 2005). Although recent records confirm the species occurs over a wider geographical range than previously thought, the aforementioned population estimate is still seen as appropriate (J. Kushlan *in litt.* 2009). Brazil (2009) has estimated the population in China at fewer than 100 breeding pairs. According to Birdlife International (2012), the total global population is most likely between 375-1,499 individuals.

When observed, the species is frequently found singly or in breeding pairs. There have been no records of the species found nesting colonially.

Due to its effective camouflaged plumage coloration, the species is most difficult to locate in forest areas outside the breeding season and hence, its whereabouts at other times of the year are difficult to verify. It appears that the best time to estimate numbers of WENH and population dynamics is during the nesting season where nesting pairs stay in one location and are therefore much easier to locate and count.

The two nests recorded at Coc Toc village remained constant from 2009 when four individuals were recorded (Pilgrim *et al.*, 2009) until 2011. At least six chicks are known to have fledged from these nests. During a massive hailstorm that caused extensive damage to housing infrastructure at BBNP in 2012 (20<sup>th</sup> April) both nests were unfortunately destroyed. It is unknown whether the nesting parent pairs survived this catastrophic event (Huong Van Chat, *pers comms*).

Information on the number of nesting birds or fledged chicks at the nest(s) located downstream of the Puong Cave on the Nang River has yet to be determined. However, nesting at this site was observed in from 2010 and 2012 by a local informant (from Ban Cam village) familiar with the species. As a result, we know that the same nesting site / location has been active over three consecutive years. In addition, a mated pair was observed foraging in the area during January 2011.

In June 2012, a single WENH nest was reported just outside the national park boundary near Ban Pjac village, Quang Khe commune. As this report was made at the end of the nesting season, BBNP rangers were unable to confirm whether it was a WENH or a Malaysian Night Heron (*Gorsachius melanolophus*).

##### **4.4.2. Behavior**

The WENH appears to be almost entirely nocturnal and roosts in trees during the day with occasional changing of roost trees (Pilgrim *et al.*, 2009). It is usually active at dusk until dawn leaving the nest to forage. Observations in China suggest that during the breeding season parent birds alternatively forage at night (Li *et al.*, 2007). According to direct observations made by Le Manh Hung at BBNP (unpublished field observations made in 2010 and 2011), individual birds leave nests to start foraging at around 1815 – 1825 hrs and occasionally as late as around 1915 hrs during the middle of summer (longest day length) and return before dawn.

The location of preferred habitat near water and nesting mostly high in trees (in areas close to human habitation and agricultural land use in particular) may also suggest that birds are likely sensitive to disturbance or changes in their environment (Li *et al.* 2007). Further, this assertion is also supported by recent field observations of the species (Dine *et al. in litt.*) where birds were observed to act cautiously prior to selecting nesting trees and night feeding activities. A considerable amount of time on each occasion was devoted towards ensuring that no obvious threats to the nest or themselves were present before they continue with the next activity such as nest construction or feeding.

#### **4.4.3. Seasonal Movements**

Little is known of whether the species undertakes seasonal movements in any of its range. It has been suggested that the species may be a migrant or vagrant species; however, Pilgrim *et al.* (2009) confirmed that the species at least breeds in northern Vietnam and is probably resident. The resident status claim has been partly confirmed through anecdotal information recorded at BBNP by a number of local community observers and Mr. Huong Van Chat<sup>2</sup>, who observed the species from August until December, however, favoring different seasonal habitat during the breeding and non-breeding seasons.

#### **4.4.4. Nesting Season**

Breeding pairs at BBNP have been recorded as nesting from January to late May (Le Manh Hung, *Pers comms*). Nest construction (over two weeks) and egg laying activities were observed from January to March with juvenile birds fledging in late May. Timing differences during the season may vary depending on whether a suitable mate was found (for newly mature birds) or if a suitable tree can be located to construct a nest and lay eggs.

#### **4.4.5. Nest Location and Construction**

From a sample of sixteen nests (10 nests: Dine *et al., in litt.*, and 6 nests: Li *et al., 2007*), they appear to be constructed a few meters below the top of large riparian trees 20 – 30 m tall, 15 to 20m above the ground and overhanging small river / stream channels (Li *et al., 2007*; Dine *et al., in litt.*). Preferred nesting trees from the 10 observed nests in Vietnam, appear to be those located 50 to 15m from the edge of the stream/river edge (Dine *et al., in litt.*).

Most nests are constructed on top of two crossing branches with the main branch nearly parallel to the ground. Nests are simple in structure consisting of hundreds of twigs arranged in a flat platform and fashioned into a disk-like external rim (Li *et al., 2007*; BirdLife International, 2012). During 2012 PRCF staff inspected a number of Chinese Pond Heron (*Ardeola bacchus*) and Malaysian Night Heron nests confused by local people for WENH Nests. They observed that WENH nests were generally much larger in size, consisted of larger branches and twigs and were structurally more simple than those of the other two heron species (Tu Minh Tiep, PRCF, *pers comms*).

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<sup>2</sup> A BBNP ranger who grew up at the locality and is familiar with the species.

#### **4.4.6. Nesting**

At the completion of the nesting season, the breeding pair will destroy the nest and will often construct a new nest in the same tree or one close nearby (if one is available) after first checking the area thoroughly for threats (Le Manh Hung, *Pers comms.* 2011; Dine *et al. in litt.*). According to observations from Huong Van Chat and Le Manh Hung (both *Pers comms.*), this behavior has also been observed at BBNP over consecutive years since 2009.

Clutch size usually ranges from one to three ovoid shaped, pale blue with white speckled eggs approximately 6.5 cm long and 3.5 cm wide (Li *et al.*, 2007), however, at BBNP eggs 4.5cm long and 2.5 wide were observed (Huong Van Chat, *Pers comms.*). The incubation period is approximately 25 - 35 days (dependent upon external temperatures influencing incubation times) with both male and females sharing the duty. The number of nestlings varies with each clutch, however, generally ranging from two to three per nest. Eames & Le Manh Hung (2009) observed a difference between the sizes of nestlings, suggesting that there may be a significant time interval between egg laying.

#### **4.4.7. Feeding habits**

Zhou Fang *et al.* (2005a) reported that the species feeds on small fish, shrimps, insects and other invertebrates. This document was prepared in Chinese language and the author of this management plan is unsure whether this information was gathered through direct observation or speculation. Potential foraging areas at BBNP (Figure 2) have been identified as low lying areas close to water such as rice fields, marshes and muddy flats around the margins of Ba Be Lake. It is thought that the species wades in water up to 20cm in depth. However, further research is required to clarify this information accurately.

During the incubation period, male or female birds were observed to leave the nest individually to forage depending on which parent was incubating the eggs at the time. However, it is unknown whether during the night adults swap with one sitting on the nest and the other foraging (Dine *et al., in litt.*). Adult birds are known to accompany and teach fledglings to forage for a period of up to three weeks prior to the fledged nestlings permanently leaving the nest to live independently (Dine *et al., in litt.*).

#### **4.5 Ability of the species to survive at viable population levels**

The location of nests and suitable habitat (large potential area) within a protected area like BBNP increases the likelihood of conserving a population over a long timeframe. However, due to the limited availability of information on non-breeding season habitat, migration or localized movement patterns (in and out of the national park) and connectivity between the fragmented populations within the region, it is still difficult to predict the ability of the species to survive over a longer term timeframe specifically at BBNP.

Hence, maintenance of the population at BBNP will therefore be partly dependent upon variables outside the geographical and management influence of the national park. However, within BBNP, specific management initiatives may be pursued to maximize the opportunities for the species to breed and forage and protect the critical habitat e.g. habitat retention, protection and restoration, access restrictions, threat abatement and contaminated water and food from pollution/agricultural chemical use.

Additional research is therefore required to assist the national park to design and implement appropriate management responses including:

- Bird dispersal through fragmented and degraded riparian forest landscapes especially through forests that create a linkage between forest inside and outside the national park
- Non-breeding season locations and migratory habits especially in upstream locations within catchments that drain directly into Ba Be lake, and key foraging zones
- Foraging locations and distances from nests and critical forest habitat
- Diet and the impacts upon adults, juveniles, hatchlings and eggs of chemicals from the ingestion of food caught within agricultural landscapes
- Ability to cope with declines in food sources concomitant with the loss of habitat and overall declines in natural food sources throughout the species' localized home range. The extent to which availability of nesting habitat is also a limiting factor.

This management plan assumes that as a result of presumed sparse and declining distribution of the species in surrounding riparian forest areas and perhaps BBNP, individual cases of nest failure and mortality are significant to the national park's population. Hence, threat mitigation will be needed:

- (i) at a local level to protect breeding pairs and individual nest sites immediately;
- (ii) protect potential habitat i.e. breeding foraging and non-breeding season roosting; and
- (iii) broadly across the regional habitat distribution to provide longer-term opportunities for the WENH population to remain viable.

## **5. Threats to White-eared Night Heron**

### **5.1. Current Threats**

#### **5.1.1. *Hunting, trapping and harvesting of birds and eggs***

At some locations outside BBNP, hunters report that the meat of the species is 'tasty' and birds were once actively hunted and trapped (with leg snares) until they became rare and difficult to find. Within the national park there is no evidence to suggest that this practice still does not occur, particularly as BBNP rangers only have limited knowledge of the existence of a small number of nests. Fortunately to date, there have been no reports that eggs and birds have been raided from known nests, so it seems unlikely that this will have occurred elsewhere in the national park. However, there is a possibility that once news spreads of more identified nests and birds that nests may be raided and birds trapped.

#### **5.1.2. *Habitat loss / degradation***

WENH appear to prefer specific habitat requirements. The loss of or degradation to any of the three types of critical habitat identified in Section 3.4 (Habitat) may impact the future viability of the species at the national park. For example:

- 1) *Breeding / nesting habitat*: disturbance from illegal cutting of nesting trees (with high economic value (e.g. Nghien: *Burretoidendron hsienmu*) near riparian forest particularly that identified in Figure 3 should be minimized and controlled with regulation

- 2) *Foraging habitat*: areas of low-lying land subject to inundation in close proximity to agricultural cultivation activities remain a concern particularly if the latter impacts foraging behavior and the food chain
- 3) *Non-breeding season roosting areas*: management of illegal cutting of important trees in non-breeding season habitat, grazing of livestock during winter and careful planning of fire management activities are particularly important.

### 5.1.3. Timber Cutting

Felling of trees used for nesting and for non-breeding season habitat has the potential to impact the survival of the species. Actions should be taken to minimize the likelihood of this happening especially on land allocated to households within the natural regeneration zone who on occasion fell trees illegally. Within the Ba Be / Na Hang Limestone Forest Complex<sup>3</sup> WENH appear to have very specific preferences for trees 20 - 30 m tall, with broad branching canopies and overhang small river / stream channels to construct nests e.g. Nghien (*Burretoidendron hsienmu*), Co Lo (*Caryodaphnopsis sp.*), Chan Chim (*Schefflera octophylla*) (Dine *et al.*, *in litt.*). Extra attention should be placed upon conserving these species in particular in identified critical habitat within BBNP (Figure 3).

### 5.1.4. Wind squalls, storms and hail

The position of nests high in the tree places them in locations where there is high potential exposure to sudden wind squalls, storms and hail resulting in cataclysmic destruction of the nest, blow eggs and nestlings to the ground and killing adult and nestlings alike (hail). In addition, nesting trees may be blown over during squalls or storms.

**Table 1: Ranking of Current Threats to White-eared Night Heron**

Impact of Threat	Nest abandonment	Nest destruction	Chicks fail to mature and leave nest	Adults fail to reproduce	Reduction in available habitat	Unable to establish nests	Difficulty feeding	Score	Priority Ranking
Hunting and trapping	X	X	X	X	-	X	X	6	C1
Habitat loss / degradation	X	X	-	-	X	X	X	5	C2
Timber cutting	X	X	-	-	X	-	-	3	C3
Wind squalls, storms and hail	X	X	X	-	-	-	-	3	C3

**Note:** ranking: “C” refers to the Current Threat Priority No. 1 – 3 e.g. C1 – C3

<sup>3</sup> An area of limestone forest consisting of protected areas and forest within Bac Kan and Tuyen Quang provinces including Ba Be National Park and South Xuan Lac Species and Conservation Area (Bac Kan); Na Hang Nature Reserve, Lam Binh watershed protection forest and Sinh Long Forest (Tuyen Quang).

## **5.2. Potential Threats**

### **5.2.1. Unsustainable nature-based tourism**

Nature-based tourism involving visits by groups of ornithologists to view birds during the nesting season is of potential concern. Without an adequate management system in place with clear restrictions / guidelines on how to view nests and birds e.g. group numbers, frequency of visits, minimum distances, access and noise restrictions, there is potential for adult birds to abandon nests and disturbance to nestlings.

### **5.2.2. Harvesting birds / eggs for scientific research and tourist souvenirs**

There is concern amongst some BBNP rangers that increases in the number of scientific and bird watching groups may result in some local people harvesting either live or dead birds or eggs to sell as samples or souvenirs.

### **5.2.3. Contamination of and reduction in food sources**

Exposure to and ingestion of food found in contaminated water *may* have an impact upon the species, for example poisoning birds (adult and juveniles), increase in un-hatched chick mortality, reduction in eggshell strength (Fry, 1995). Spraying of agricultural chemicals e.g. DDT (Dichlorodiphenyltrichloroethane) in riparian areas may contaminate mud and water found within the preferred 20cm wading depth. During foraging birds may inadvertently be exposed.

Exposure to chemicals and pollutants, and ingestion of dead or poisoned food is of major concern not just to the birds themselves but also to the food chain. This threat may have a long-term impact upon food availability for the species at key foraging locations.

### **5.2.4. Agricultural and boat docking activities**

Each of these activities may threaten nesting success and result in either direct disturbance to the nest or cause parent birds to abandon nests. These include:

- Agricultural cultivation (e.g. maize) often occurs in close proximity to nests, especially at times of the year that coincide with the nesting season
- Grazing of livestock in riparian or adjacent forest
- Boat docking areas at Coc Toc village (Ta Han Stream) or frequently used boat channels on the Nang River (e.g. downstream of the Puong Cave).

### **5.2.5. Infrastructure Development**

Construction activities (e.g. roads, bridges, power lines, agriculture, buildings) within and near riparian forest particularly that identified in Figure 3, have the potential to disturb nesting sites, destroy and degrade critical habitat. These activities should be mitigated against to minimize impacts as part of the development approval.

### 5.2.6. Climate Change

Scientists have reached a general consensus that changes to biodiversity due to climate change will be high and wide-reaching in terms of scale and speed. However, it is difficult to predict how and when individual species will respond to climate change, or how ecosystems will change. Birdlife International (2008) suggests the following broad areas of impact to birds including the WENH:

- a) changes in behavior and plant phenology
- b) range shifts and contractions
- c) disruption of species interactions and communities
- d) exacerbates other threats and stresses, such as disease, invasive species and habitat fragmentation, destruction and degradation.

The species' range is geographically restricted and its habitat is under considerable pressure from human disturbance, particularly habitat destruction and fragmentation. As a protected area the national park may provide a last refuge for a species in Vietnam whose population is likely to be declining in the wild. All measures possible should be made to manage the habitat of the species at national park, particularly assist the species to adapt to localized climate induced changes e.g. where there is no latitudinal shift possible.

**Table 2: Ranking of Potential Threats to White-eared Night Heron**

Impact of Threat	Nest abandonment	Nest destruction	Chicks fail to mature and leave nest	Adults fail to reproduce	Reduction in available habitat	Unable to establish nests	Difficulty feeding	Score	Priority Ranking
Uncontrolled nature-based tourism	X	X	X	X	-	X	-	5	P3
Harvesting birds / eggs - scientific research and tourist souvenirs	X	-	-	-	-	X	-	2	P1
Contamination of and reduction in food sources	-	-	X	X	X	X	X	5	P3
Agricultural and boat docking activities	X	-	-	X	-	X	-	3	P5
Infrastructure Development	X	-	-	-	X	X	X	4	P1
Climate Change	-	-	-	X	X	-	X	3	P5

**Note:** Priority ranking: "P" refers to the Potential Threat Priority No. 1 – 5 e.g. P1 – P5

## 6. Management Actions

### Management Actions Goal:

Maintain, and improve the future population status and protection of critical habitat of the WENH at BBNP between 2013 – 2017.

### Objective 1: Threat abatement and mitigation

Action	Outcomes	Coordinating stakeholder	Participants	Performance Indicators
<b>Action 1:</b> Define the location of critical WENH habitat	<ul style="list-style-type: none"> <li>Potential nesting / breeding, foraging and non-breeding season roosting areas identified</li> <li>New and existing nesting sites identified</li> </ul>	National Park	Local communities, ornithologists, NGOs	<ul style="list-style-type: none"> <li>Map of nesting / breeding, foraging and non-breeding season roosting habitat defined by 2014</li> <li>Map of nesting sites prepared and updated annually</li> </ul>
<b>Action 2:</b> Demarcate WENH habitat protection zones	<ul style="list-style-type: none"> <li>All stakeholders can identify the location of breeding / nesting and foraging zones (habitat)</li> </ul>	National Park	Local communities NGOs	<ul style="list-style-type: none"> <li>Boundaries of each habitat protection zone physically defined with signage on-site by 2014</li> </ul>
<b>Action 3:</b> Protect known nesting sites	<ul style="list-style-type: none"> <li>Annual update on location of WENH nests completed</li> <li>Clearly defined operation mechanism for the community-based nest protection program</li> <li>Stakeholders participating in nest protection program understand the benefit sharing mechanism</li> <li>Annual WENH nest protection program using community nest protectors operational</li> </ul>	National Park NGOs	Local communities, Ornithologists, Nam Mau CPC	<ul style="list-style-type: none"> <li>Nest protection program plan prepared (including surveys to identify nests, training of nest protectors, nest protection activities and debriefings) annually</li> <li>Surveys conducted collaboratively with local communities at beginning of the nesting season annually</li> <li>One training course for community nest protectors completed annually</li> <li>Community benefit sharing mechanism for nest protectors defined by 2013 and updated annually</li> <li>Nests commence protection from 2013 and annually thereafter</li> <li>Number of nests protected and participating</li> </ul>

<b>Action 4:</b> Minimize seasonal disturbance to nesting sites	<ul style="list-style-type: none"> <li>• Activities that impact identified nests on a seasonal basis identified</li> <li>• Activities that seasonally impact nests mitigated</li> </ul>	National Park	Local communities, boat drivers, Farmers, Nam Mau CPC	<ul style="list-style-type: none"> <li>• nest protections annually</li> <li>• By 2017 number of nests under protection tripled from 2013 baseline</li> <li>• Potential activities that may impact nests defined on a nest by nest basis annually</li> <li>• Local communities informed of seasonal prohibited activities near nesting sites annually</li> <li>• Number of nest sites and types of activities seasonally mitigated documented</li> </ul>
<b>Action 5:</b> Reduce pollution of foraging areas by agricultural chemicals	<ul style="list-style-type: none"> <li>• Local agricultural communities understand the impacts of agricultural chemicals upon WENH</li> <li>• Farmers provided with practical training on how to use agricultural chemicals responsibly</li> <li>• Practices of agricultural chemical users in riparian and shallow wading areas changed</li> </ul>	Nam Mau CPC	National Park Farmers Union Farmers	<ul style="list-style-type: none"> <li>• One set of training materials on responsible use of agricultural chemicals in riparian lands and wetlands completed for use in 2016 season</li> <li>• Number of training courses completed with farmers in areas identified as key foraging areas within BBNP from 2016 and beyond.</li> <li>• Regulation developed to guide use of agricultural chemicals in riparian lands and wetlands by 2016</li> </ul>

**Objective 2: Community Education and awareness of the WENH and its habitat**

Action	Outcomes	Coordinating stakeholder	Participants	Performance Indicators
<b>Action 6:</b> Raise awareness of conservation of WENH amongst park visitors and BBNP staff	<ul style="list-style-type: none"> <li>• Increased awareness of WENH conservation and significance of the species at BBNP by park visitors and BBNP staff</li> <li>• Awareness raising displays and materials developed and equipment purchased for the</li> </ul>	National Park	Park visitors, tour companies, BBNP staff, NGOs	<ul style="list-style-type: none"> <li>• WENH awareness raising concept for the VIC defined inclusive of approach, materials, equipment and funding requirements by 2014</li> <li>• Proposals made to government (and/or other donors) to fund WENH conservation concept by 2014</li> <li>• Awareness raising materials and displays</li> </ul>

<p><b>Action 7:</b> Raise awareness of conservation of WENH and its habitat amongst local community</p>	<p>visitor information center (VIC)</p> <ul style="list-style-type: none"> <li>Increased awareness of WENH conservation and significance of the species at BBNP by school students and their families</li> <li>Community awareness raising program for WENH conducted</li> <li>Change of behavior towards protection of WENH</li> </ul>	<p>National Park Local schools</p>	<p>Department of Education, Youth Union, school students, NGOs</p>	<p>developed and installed in the VIC by 2015</p> <ul style="list-style-type: none"> <li>School program defined and ongoing by 2015</li> <li>Annual participation by schools in awareness raising activities during the nesting season from 2015</li> <li>Local schools and communities participate in conservation activities</li> </ul>
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**Objective 3: Ba Be National Park policy Development**

Action	Outcomes	Coordinating stakeholder	Participants	Performance Indicators
<p><b>Action 8:</b> Regulation guiding management of nature-based tourism</p>	<ul style="list-style-type: none"> <li>Stakeholders interested in sustainable nature-based tourism to nesting sites consulted</li> <li>Clear understanding and consensus amongst stakeholders on conservation management issues and solutions</li> <li>Legal framework to regulate nature-based tourism involving nesting sites</li> </ul>	<p>National Park</p>	<p>Bird watching tour companies, local community, Nam Mau commune, NGOs</p>	<ul style="list-style-type: none"> <li>Consultation workshop completed by 2015 to obtain views from WENH sustainable nature-based tourism at nesting sites stakeholders</li> <li>Minutes of consultation workshop completed and circulated to seek input from stakeholders</li> <li>Conservation management issues identified and potential solutions addressing them defined</li> <li>Regulation with specific guidelines defined on how nature-based tourism activities will operate by 2015</li> </ul>

<b>Action 9:</b> Integration of the WENH Management Plan into BBNP Conservation Management strategies / plans	Activities identified within the WENH Management Plan are integrated into BBNP's Operational Management Plan, Investment Plan and other conservation planning documents	National Park NGOs	Other government stakeholders	WENH Conservation activities included in periodic revisions of the BBNP's conservation management documents including the revision of the 2010 – 2015 Operational Management Plan and the Investment Plan
<b>Action 10:</b> BBNP Management Board monitors implementation of the management plan	Monitoring of the results from Management Plan implementation to measure success and update conservation objectives and activities	National Park	Nam Mau CPC, NGOs	<ul style="list-style-type: none"> <li>• BBNP Management Board conducts annual monitoring of the plan against performance indicators commencing in 2013.</li> <li>• Documentation of the number and success of conservation activities implemented</li> </ul>

## 7. Implementation Plan and Budget

Activity	Year of Implementation					Budget (US\$)
	2013	2014	2015	2016	2017	
<b>Action 1:</b> Define the location of critical WENH habitat						3,000
<b>Action 2:</b> Demarcate WENH critical habitat protection zones						3,500
<b>Action 3:</b> Protect known nesting sites						20,000
<b>Action 4:</b> Minimize seasonal disturbance to nesting sites						2,000
<b>Action 5:</b> Reduce pollution of foraging areas by agricultural chemicals						4,000
<b>Action 6:</b> Raise awareness of conservation of WENH amongst park visitors and BBNP staff						20,000
<b>Action 7:</b> Raise awareness of conservation of WENH and its habitat amongst local community						12,000
<b>Action 8:</b> Regulation guiding management of nature-based tourism						3,000
<b>Action 9:</b> Integration of the WENH Management Plan into BBNP						2,000

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Conservation Management strategies / plans						
<b>Action 10:</b> BBNP Management Board monitors implementation of the management plan						<b>3,000</b>
<b>Total</b>						<b>72,500</b>

**NOTE:** Most activities contained within the Management Plan may be implemented individually as budget is available. If one activity can't be implemented then this should not be used as a reason to not implement or postpone other activities.

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## Appendix 1: Suggested Prioritized Research Actions

### Research Actions Goal:

To improve scientific understanding of the White-eared Night Heron and assess the effectiveness of conservation management and community involvement activities

**NOTE:** The research actions contained in the following tables are suggested topics of research that could be conducted by researchers from tertiary institutions within and outside Vietnam, BBNP itself and other conservationists to assist future conservation of WENH at BBNP. Hence, no particular group of researchers has been delegated as a lead role in performing these activities.

Activities / Actions	Description	Justification	Timeframe	Priority Ranking
<b>Action 1:</b> Regular census of the WENH population	Annual surveys during the nesting season should be undertaken to determine the population of WENH found within BBNP. Survey activities should be implemented with local communities and targeted along the Ta Han, Bo Lu and Cho Len streams, Nang River and within suitable habitat located at Lake 3.	Important to understand the current population status and prioritize management resources to protect nests, as they are located.	January - May	<b>1</b>
<b>Action 2:</b> Investigate home range	Research will aim to gain an appreciation of the distances flown by WENH from their seasonal habitat e.g. nesting and non-breeding season roosts, foraging sites. Could be undertaken using radio transmitter tracking technology.	Location of critical habitat is defined so that management solutions and actions can be implemented.	Year round	<b>7</b>
<b>Action 3:</b> Study ecological conditions favored by WENH	Little is known of the ecological conditions favored by WENH throughout the year, movement patterns and how sites are selected by mating pairs or individuals.	Assists managers to zone priority areas for protection and conduct fire planning to minimize impact upon WENH.	Year round	<b>2</b>
<b>Action 4:</b> Investigate population connectivity with nearby sites in the region	Nesting birds have been located at a variety of locations within the BNFC and further study is required to determine if these various sub-populations are linked to one another. Could be undertaken using satellite transmitter tracking technology.	Understand population connectivity, flow of genetic information and provide information to conduct landscape wide conservation.	Year round	<b>8</b>

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<b>Action 5:</b> Annual nest monitoring	A study of WENH birds during the nesting season from multiple nesting sites to understand nesting, behavior and biology. Activities would involve day-by-day observation of nests from a safe distance (30 - 100m).	Justification on the basis of the species being poorly known. Activity also used to document information for Action 8.	January - May	<b>5</b>
<b>Action 6:</b> Seasonal diet composition	Understand the preferred diet composition and feeding habits of WENH on a seasonal basis. Droppings found beneath nests would be collected and content analyzed.	An understanding of diet used to target specific activities e.g. use of agricultural chemicals that kill preferred food species and may cause harm to birds	Year round; January - May	<b>4</b>
<b>Action 7:</b> Investigate impacts of chemical residues upon birds	Study potential impacts of the application of agricultural chemicals within riparian and foraging areas upon adult birds, nestlings and eggs. The preferred diet of WENH would be analyzed at a number of known foraging locations to determine what levels are considered to be harmful to adult birds, nestling and eggs.	Understand the impacts of agricultural chemicals upon birds and nesting / fledging success. New knowledge may be used to change the type and application of chemicals in foraging areas.	January - May	<b>6</b>
<b>Action 8:</b> Impacts of disturbance upon birds during nesting	Assess the responses to birds from a variety of disturbances and suggest recommendations to manage nature-based tourism, balance agricultural activities and infrastructure development. This would require day-by-day observation of nests ( <b>Action 5</b> ) with particular emphasis at locations where disturbance threats have been identified.	Determine the type, level and distance (from nests to stimuli) of disturbance that will have an impact upon nesting success.	Year round. January - May	<b>3</b>
<b>Action 9:</b> Evaluate performance of the community education programs to engage the community	The ability of the education activities to promote awareness and engage the community in WENH conservation within BBNP will be compared after five years with a baseline conducted at the beginning of the education program. This would also include a behavior change component.	Determine whether the education programs implemented to support conservation activities are appropriate and effective.	First year 2017	<b>9</b>
<b>Action 10:</b> Modeling to predict impacts of climate change upon WENH	A variety of modeling methods will be applied e.g. species distribution models to project how the distributions of species may change under different scenarios of climate	Determine potential impacts upon the species and define management actions to assist the species to adapt.	2016	<b>10</b>