
Notes and records

The distribution, ecology and status of the yellow bittern *Ixobrychus sinensis* in Seychelles

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Introduction

The yellow bittern *Ixobrychus sinensis* (Gmelin) is a widespread Asian species. The population in the Seychelle islands is the most westerly and most isolated. Although this population may seem to be a biogeographical anomaly there is a strong Asian influence on the Seychelles and western Indian Ocean avifauna (Benson, 1984), due to a southern African–Asian migratory route (Feare & Watson, 1984; Phillips, 1997). In addition, northern populations of yellow bittern are long distance migrants, which may explain colonization of remote islands.

The species is closely associated with marsh habitats and because such habitats are highly restricted in the Seychelle islands the population is believed to be small. It has been recorded as resident on the islands of Mahé, Praslin and La Digue, with visiting birds recorded on Curieuse and Aride (Bowler & Hunter, 2000). The first studies of the bird were made in 1975–78 (Watson, 1980) when the population was estimated at 'certainly fewer than 100 pairs'.

During studies of marshes in Seychelles many records of bitterns were accumulated and are reported here.

Methods

Research into Seychelles marsh ecology and bird distribution was carried out in 1990–2000. All marshes were visited and notes made of their habitat and the presence of visible bitterns at different times of day. Where possible

vantage points overlooking the marshes were used to maximize the area that could be examined through binoculars.

Observations were made for 30 min, during which time a note was made of the number of bitterns seen. Some areas were examined by walking through the marsh, disturbing birds in the surrounding reedbeds.

Results

On Mahé six marshes were inhabited (seven previously – Watson, 1980); one on Praslin and one on La Digue. A total of five former sites have been lost to drainage.

Repeat visits to two sites (Beau Vallon and Anse Intendance) allowed both visual observation and exploration on foot. On each visit visual observations comprised 67–100% of birds found by disturbance, suggesting that observation was an acceptably accurate method.

Some sites were easily observed and the number of birds is believed to represent most of the population. For the sites that could not be explored on foot the mean density by observation (25.05 ha⁻¹) has been used to estimate the population size (Table 1). These estimates give a population of 228 birds, which is comparable to the earlier estimate of fewer than 100 pairs (Watson, 1980).

Discussion

The Seychelles yellow bittern population is associated with densely vegetated marshes. These are highly localized and most have been significantly disturbed by agriculture and development over the last 200 years.

Mahé has the largest human population of all the Seychelles islands and the largest tourism infrastructure. Consequently marshes are subject to development pressure and areas have declined by 25–99%. On Praslin, the only bittern site was Anse Kerlan, which has been gradually reclaimed for agriculture. In 1999, it was drained for an airport expansion and the creation of a golf course. The main marsh on La Digue has been subject to encroachment and pollution (Bullock *et al.*, 1988) but these have not affected bittern habitat. In the 1990s, some

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Table 1 Population estimates for bitterns in Seychelles

Island	Marsh	Max. number of bitterns	Reed/fern marsh area (ha)	Study area (ha)	Density (no. ha ⁻¹)	Population	
						Observed	Estimated
Mahé	North-east Point	8	2.06	0.69	11.65	–	52
	Beau Vallon	6	0.11	0.11	54.55	6	–
	Roche Caiman	3	2.90	0.50	6.00	–	–
	Bird Sanctuary						
	Anse Gouvernement	4	0.75	0.15	26.67	–	19
	Anse Intendance	2	0.04	0.04	50.00	2	–
	Police Bay	6	0.25	0.25	24.00	6	–
Praslin	Anse Kerlan	6	1.84	0.23	26.09	–	46
La Digue	Mare Soupape	3	3.89	2.00	1.50	–	97
Total							228

areas were invaded by alien water weeds (Gerlach, 1997), resulting in the extinction of many bittern prey species. Attempts to clear the marsh were partially successful (G. Jessy, personal communication).

Whilst any habitat reduction is to be regretted, development need not necessarily cause extinction of the bitterns. The retention of the marsh within the hotel development at Anse Gouvernement is a model of integration of marsh habitat and development and should be followed by any similar developments. The only habitat expansion has been at the Roche Caiman Bird Sanctuary (Mahé). This artificial site was created by reclamation and has been managed as a reserve since 1992 by The Nature Protection Trust of Seychelles and the Seychelles Government's Division of Environment (Gerlach, 1992).

Under IUCN Red List criteria (IUCN, 1994) and their national application (IUCN, undated) the yellow bittern in Seychelles is critically endangered on the basis of its restricted, fragmented and declining distribution and populations (criteria B1, 2c and d). Although it is not endemic to Seychelles or globally threatened it represents an extremely isolated gene pool of considerable biogeographic interest and an outstanding indicator species. Although birds have frequently been cited as indicator species (e.g. ICBP, 1992) the value of the species used is highly variable. In Seychelles, the birds given highest conservation priority have already suffered population collapses and do not indicate ecosystem health. Furthermore high profile species, such as the Seychelles magpie robin (*Copsychus seychellarum*) tend to be ecological generalists, whilst the yellow bittern is obligately associated with high quality marsh systems. As such the yellow bittern is an outstanding indicator of marsh

quality and an indirect indicator of biodiversity in these ecologically important habitats.

As a result of its low global conservation priority, enacting practical conservation measures for the yellow bittern is difficult. The significance of yellow bittern conservation was recognized by the original draft of the Seychelles Important Bird Areas (IBAs) directory (Rocamora & Skerrett, 1998). This designated two IBAs entirely because of their bittern populations and one site partly for this reason. Their inclusion was approved at a national workshop, but subsequently opposed by BirdLife Seychelles on the basis that 'yellow bittern marshes are simply not very important and should be removed' (S. Parr *in litt.* 26.IV.1999). As a compromise, they were retained on a 'shadow list' of potential IBAs (Rocamora & Skerrett, 1999).

The long-term survival of yellow bitterns in Seychelles will depend on the establishment of new populations in secure areas. Attempted colonizations of islands, such as Aride and Curieuse have not been successful, probably because the habitat areas are currently too small. The most important unoccupied island is Silhouette, which has 15 ha of marsh that The Nature Protection Trust of Seychelles plans to restore to its natural state, including 5 ha of reedbed. From the numbers of bitterns seen in other marshes in Seychelles an area of this size would be expected to support at least 100 bitterns.

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