Yellow Bittern Yoshigoi (Jpn) *Ixobrychus sinensis*

Morphology and classification

Classification: Pelecaniformes Ardeidae

Total length:	ca. 36.5cm	Tail length:	39-49mm
Wing length:	126-146mm	Tarsus length:	40-51mm
Culmen length:	50.4 ± 0.2mm	Weight:	113.1 ± 2.7g

Body weight is the mean ± SE of five adult birds (♂ 3, ♀ 2) captured in Aomori Prefecture. The other measurements are the mean value ± SE of 40 individuals: 34 specimens in the Yamashina Institute collection as well as six individuals captured in Aomori Pref.

Appearance:

Yellow Bitterns are the smallest heron breeding in Japan. They have long toes. Since they have a tweezers-like bill with fine protrusions along the outer edge, they rarely let their captured prey slip out of the bill. The male and female are the same in body size, but different in plumage color. A dark patch on the crown is more conspicuous and the contrast between dark and light colors of the wings is stronger in the male. On the other hand, vertical brown stripes of the throat is more remarkable in the female. The base of the bill turns red in the breeding season, which is more noticeable in the male (Photo 1).

Photo 1. Male (left) and female (right) Yellow Bitterns in the breeding season.

Vocalization:

Male Yellow Bitterns utter call that sounds like "Ohr, ohr" during the breeding season. They usually call at night, but sometimes call during the day as well.

Distribution and Habitat

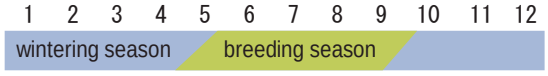
Distribution:

Yellow Bitterns are year-round residents in some parts of the Indochina Peninsula, India and Sri Lanka. They are separately distributed in Seychelles and Oman as well. They are summer visitors in the most part of China, the Korean Peninsula and mainland Japan, and winter residents in New Guinea and Borneo (Kushlan & Hancock 2005). Although Kushlan & Hancock (2005) describe them as breeders in Sakhalin, Russia and Hokkaido, northern Japan, they are assumed to be rare at least in Hokkaido.

Habitat:

Yellow Bitterns occur and breed on the edge of the water rich in emergent plants. Although they sometimes flutter over the water, they usually move from stem to stem through emergent plants. Since they generally spend most of the time hidden in the vegetation, they are harder to detect among waterfowl.

Life history



Breeding system:

Yellow Bitterns winter in Southeast Asia and the Ryukyu Islands, southernmost Japan and visit mainland Japan as a summer visitor. They never fail to arrive in Aomori Pref., northern Japan at the end of May and leave there for the wintering grounds in the south in September after they have finished breeding every year. But they seem to stay as late as October in southern Japan.

Nest:

Yellow Bitterns build a basket-shaped nest above the water by skillfully bending emergent plants, such as cattail, narrow-leaved cattail and softstem bulrush (Photo 2). They do not seem to like reed beds as a nesting place. Although they usually nest alone, it was reported that they formed a breeding colony in the riverside area of Saitama Pref., central Japan. (Uchida & Matsuda 1990, Ueda 1996).

Photo 2. A nest built in the softstem bulrush community. (Pond in Aomori June 29, 2008)

Egg:

The clutch size ranged from four to eight eggs (mode = 6; Fig. 1) in 21 nests from irrigation ponds of Aomori Pref.. Their clutch size in Aomori Prefecure is almost the same as that of the breeding colony of Saitama Prefecure (Uchida & Matsuda 1990). Yellow Bitterns laid the first egg from early June to late July in 13 nests of Aomori Pref., and there was little difference in first-egg laying date between Aomori and Saitama Prefs.

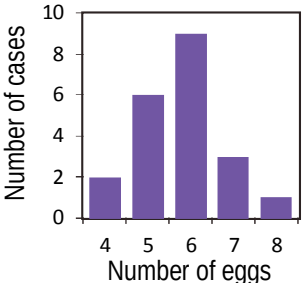


Fig. 1. Clutch size distribution of 21 nests in the irrigation ponds of Aomori Pref.. In a nest with eight eggs, none of the eggs hatched and the pair abandoned incubation eventually. One of the three nests with seven eggs was deserted during the incubation period from an unknown cause.

Incubation and nestling periods:

All the eggs hatched 17-20 days after the last egg was laid (Uchida & Matsuda 1990). Male and female incubate the eggs in turn. During the night, however, the male or female continues incubating alone in the study site of Aomori Pref. The female is usually responsible for the night incubation, but the male is sometimes engaged in it. The eggs do not hatch simultaneously, and therefore it takes several days for all the eggs to hatch. Both male and female feed the chicks, but they do not feed them at night. The chicks grow rapidly and they rarely return to the nest about 20 days after hatching.

Diet and foraging behavior

Yellow Bitterns lie in ambush on the stalks of emergent plants and the pads of floating plants or walk slowly in the shallow water to capture fish quickly from above the water. The parent birds usually feed small fish, such as loach (*Misgurnus anguillicaudatus*) and stone moroko (*Pseudorasbora parva*) to the chicks, but tree frogs and crayfish are sometimes fed to them as well in a riverside area

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Toshiaki Hirano

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of Saitama Pref. (Ueda 1992). Yellow Bitterns nesting in an irrigation pond not only forage in the pond but also fly over the bank to adjacent paddy fields to feed. Stone morokoes are more important prey to Yellow Bitterns foraging in a pond than loaches because loaches do not come up to the surface of the water very often, but stone morokoes rise to water surface for aquatic surface respiration when the dissolved oxygen level becomes low.

Topics of ecology, behavior and conservation

Asynchronous hatching

Yellow Bittern chicks do not hatch simultaneously, which is responsible for a great difference in body size between the chicks of the same nest. In the study site of Aomori Pref., however, most of the chicks successfully reach at least the stage where they are fed outside the nest. Since Yellow Bitterns have asynchronous hatching and feeding habit in common with Grey Herons (*Ardea cinerea*) and Black-crowned Night Herons (*Nycticorax nycticorax*), it is interesting to note that they enjoy a good breeding performance in marked contrast to these herons. It is also characteristic of Yellow Bitterns that their chicks grow rapidly.

Alert behavior

It is well known that Yellow Bitterns adopt a so-called "bittern posture" where they stand erect with the bill upright to mimic a reed when they are on the alert for approaching predators and humans. It is certainly difficult to detect them when they assume this posture. Yellow Bitterns which have adopted this posture do not run away even if people come considerably close to them probably because they have "absolute confidence ?" in their own mimicry. They can be captured by hand (Uchida & Matsuda 1990). When the author and his co-workers carried out a study of them in irrigation ponds, they returned to the nest immediately after the study was finished. They did not seem to mind a video camera we had placed right in front of the nest at all.

Risk of extinction

Yellow Bitterns were designated as a near threatened species (NT) in the 2006 and 2012 editions of the Red List of the Ministry of the Environment. The decline of Yellow Bitterns breeding in Japan can be attributed primarily to the loss of emergent plants in their breeding grounds resulting from the construction of concrete bank walls and the marked decrease of small fish due to the predation of illegally released largemouth bass (*Micropterus salmoides*).

Impact of introduced fish

Photo 3. Largemouth bass.

Small fish is the staple diet of largemouth bass, but they also prey on shrimps and large aquatic insects. Even birds were prey to them (Shimada & Fujimoto 2009). In Izunuma, Miyagi Pref. where released largemouth bass have increased, for instance, small fish such as stone morokoes and bitterlings have been severely depleted, which has in turn given rise to a collapse in the population of small piscivorous birds, such as Little Grebes (*Tachybaptus ruficollis*), Smews (*Mergellus albellus*), and Little Egrets (*Egretta garzetta*) (Shimada et al. 2005). Although they did not refer to Yellow Bitterns in their report, they are probably in a similar plight.

Photo 4. A "pond of oxygen deficient type" whose surface is covered with water chestnuts.

In some of the small irrigation ponds, on the other hand, the surface of the water is covered with floating-leaved plants such as water chestnuts in summer, which markedly reduces the dissolved oxygen level in the water. Indigenous fish species, such as stone moroko, Japanese rice fish (*Oryzias* spp.) and crucian carp (*Carassius* spp.) can survive oxygen deficiency by rising up to water surface for aquatic surface respiration, but largemouth bass cannot effectively adopt aquatic surface respiration and therefore they will not increase in a pond of this type even if they are released.

Ponds which allow small fish to survive by preventing largemouth bass from increasing are of great benefit to Yellow Bitterns, Little Grebes and Common Kingfishers (*Alcedo atthis*), which I call a small piscivorous bird trio of an irrigation pond. It is a requirement for Yellow Bitterns in particular that small fish are available just below the surface of the water. It is of great importance, therefore, that fish rise to the water surface for aquatic surface respiration as well as that luxuriant water chestnuts provide footholds of locomotion even in the center of a pond. Small irrigation ponds as well as large lakes and marshes play a major role in conserving the fauna of bodies of water including fish.

Literature

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I originally studied the ecology and behavior of fish. But the study made me realize keenly that I had to know the behavior of piscivorous birds to understand how fish behaved. Since then I have been interested in the ecology and behavior of herons, egrets and grebes.

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