

Blakiston's Fish Owl Shima-Fukuro (Jpn) *Ketupa blakistoni*

Morphology and classification

Classification: Strigiformes Strigidae

Total length: 660-685mm (n=7) Tail length: 260-289mm (8)
 Wing length: 482-527mm (8) Tarsus length: 80.0-90.8mm (7)
 Culmen length: 33.1-38.0mm (9)
 Weight: ♂ 3150-3450g (3) ♀ 3360-4600g (4)

The measurements are after Yamamoto (1999).

Appearance:

Males and females are similar in plumage coloration. They are ashy brown all over, with the white throat conspicuous when calling. The face is slightly deeper ashy brown. The chest, belly and flank are pale grayish brown. The flight feathers are dark brown with nine beige lateral stripes. The wing covert feathers are brown with wide dark brown shaft-stripes and pale rusty-red lateral stripes tinged with yellow. The rectrices are brown with seven or eight cream horizontal bars.

Plumage coloration based on Yamamoto (1999).



Photo 1. Blakiston's Fish Owl.

Vocalization:

Adult pairs frequently exchange calls. When males hoot "boh, boh", females call "boh" in response to the males. This bass duet carries more than 1km. The young shriek "Bie-, bie-", when they beg for food.

Distribution and Habitat

Distribution:

Blakiston's Fish Owls are distributed as a resident in the limited areas of the Far East such as Magadan in Russia at 60°N on the coast of the Sea of Okhotsk to the Ussuri River valley, southern Sakhalin Island, northeastern China, Kunashirito and Shikotanto of the Kuril Islands, and Hokkaido, northern Japan (Fig. 1). The world population is estimated to be between several hundred birds (Collar 2001) and 800 birds (Slaght & Surnach 2008). Since their worldwide extinction is concerned, they are designated as an Endangered Species in the Red List of IUCN (IUCN Species Survival Commission 2008).



Fig. 1. Distribution of Blakiston's Fish Owls.

Habitat:

Blakiston's Fish Owls feed on fish, uncommon diet for owls, which restrict their range in the vicinity of a water system such as a river. They hunt primarily during the night in rivers, lakes, marshes and occasionally on the sea shore. They roost in a broad-leaved forest or a mixed forest of coniferous and broad-leaved trees along a river during the daytime. Since the distribution is limited to a cold district, ice-free open water is extremely important to their survival in winter.

Life history

1 2 3 4 5 6 7 8 9 10 11 12
 breeding season non-breeding season

Breeding system:

Blakiston's Fish Owls are monogamous and they generally maintain their pair-bond until they lose their partner due mostly to death. It is not uncommon for them to retain their pair-bond for more than ten years. They stay with their partner all year round and they are assumed to hardly ever divorce, but Yamamoto (1999) reported a single case where a male territory owner was replaced by a male intruder following a battle.

In Hokkaido, they lay eggs from late February to mid-March, following copulation in early February in the coldest period of winter. Breeding duties are distinctly divided between the male and female of a pair. The female takes full responsibility for brooding the eggs and nestlings, while the male hunts and feeds the female and nestlings. In the latter half of the nestling period, however, the female also feed the young.

Nest:

Blakiston's Fish Owls generally nest in a cavity of broad-leaved trees, but they need a large hollow of a tree with a diameter of 1m because they are one of the largest owls of the world. In the Tokachi region, south-central Hokkaido, they used Japanese linden, Mongolian oaks and Katura trees (*Cercidiphyllum japonicum*), while in the Nemuro region, eastern Hokkaido, they nested in Japanese Elm, *Acer mono* and *Betula ermani* (Yamamoto 1999), and in the Shiretoko Peninsula, eastern Hokkaido *Ulmus lacinata* was also used (Takenaka 1999). However, many Blakiston's Fish Owls depend on nest boxes for breeding because most broad-leaved trees large enough to nest have already been felled. They also nested in an old nest of Black Kites (*Milvus migrans*) and on the ledge of a cliff (Yamamoto 1999).

Egg:

The clutch size is 1-2 eggs. The egg is laid at 2-5 day intervals. The egg is white in color and 55.9-69.4mm by 49.0-52.8mm in size (n = 23) (Yamamoto 1999).

Incubation and nestling periods and fledging rate:

The incubation period is 35-38 days. The eggs hatch from late March to mid-April. In one of the study sites of the Tokachi region, eggs were laid every year for 21 years from 1989 to 2009, but they did not hatch for 10 years, which showed a low hatching rate. Females continue to brood the nestlings for about two weeks after hatching. The nestlings usually fledge 48-60 days after hatching, but Yamamoto (1999) reported a 69-day nestling period. In one of the study sites of the Tokachi region, the fledging rate of nestlings was 89% from 1989 to 2009 (n = 18 birds). The young usually fledge from mid-May to early June, but the parent birds continue to feed them until autumn or occasionally even towards the winter.

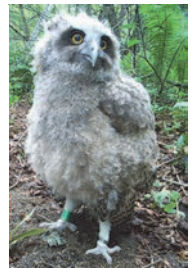


Photo 2. Nestling of about 50 days old

Diet and foraging behavior

The diet of Blakiston's Fish Owls consist principally of salmonid fish, such as pink salmon (*Oncorhynchus gorbuscha*) and Japanese char (*Salvelinus leucomaenis*) which go upstream in autumn and dolly varden trouts (*Salvelinus malma*) which spend their lifetime in a river (Takenaka 1999, Yamamoto 1999). Also they often capture stone loach (*Barbatula barbatula*), sculpins (*Cottus pollux*) and lamprey (*Lampetra reissneri*). Food items of the most importance next to fish are amphibians such as frogs and salamanders, followed by birds (ducks), small mammals (mice and shrews) and crustaceans (crawfish) or uncommonly beetles, which shows the diversity of their prey.

Topics of ecology, behavior and conservation

● Dispersal, homecoming and inbreeding

When Blakiston's Fish Owl juveniles are ready to support themselves, they depart from their natal site for a new habitat in the first or second spring after fledging, but some female young return to the natal site repeatedly. In the study site, for instance, a female returned to the natal site every winter until she became five years of age, even though she lived with her husband in their own territory, which suggests that her parents remembered her for a long time. Some single females return to the natal site and stay there for good. For instance, a five-year-old daughter who happened to return to the natal site immediately after her mother disappeared paired with her father in the natal territory and continued to breed for 12 years (Hayashi 2009). This female bird committed another sin. She paired with her own grandson who returned to the natal site after her father disappeared and raised young twice successfully (Hayashi 2009). Moreover, brothers and sisters of different ages met and paired in the site where they arrived after dispersal from their natal site, which suggests that it is not so uncommon for Blakiston's Fish Owls to inbreed in Hokkaido.

● Decline and conservation of the population

Specimens and other data show that Blakiston's Fish Owls used to be widely distributed in Hokkaido including Sapporo, Hakodate and Obihiro (Hayashi 1999). They have been declining in number and diminishing in range because they have lost their food and nesting resources due to the modification of fluvial environment and timber harvesting during the high economic growth period as well as the exploitation of run-up salmon for artificial hatching farms. Japanese breeding population of Blakiston's Fish Owls is currently about 35 pairs, which occur mainly in eastern Hokkaido. They are listed among a "Critically Endangered" category as a species at an extremely high risk of extinction in the immediate future (Wildlife Division, Nature Conservation Bureau of the Ministry of the Environment 2002).

Since 1984, the Ministry of the Environment has conducted the conservation program of Blakiston's Fish Owls which includes the three projects of 1) breeding pair support by creating feeding ponds, 2) the installation of nest boxes and 3) the banding of fledglings for individual identification to allow long-term monitoring of the population. These time- and labor-consuming efforts have steadily produced results. Over 200 nest boxes have been installed, and the breeding sites of the Nemuro and Tokachi regions have become a supply source of young as a result of the feeding project started at an early period. A high fledging rate of nestlings is supported by safe nest boxes and artificial feeding. In a breeding site of the Tokachi region, for example, a pair delivered food to a nestling 470 times in total until it fledged, and provisioned fish represented about 50% of the delivery frequency and more than 90% of the food weight (Fig. 2). Wild fish occur quite sparsely in the breeding grounds where Blakiston's Fish Owls depend heavily on artificial feeding (Takenaka 1999), and therefore they can hardly produce offspring without artificial feeding.

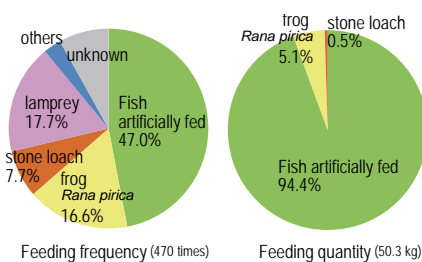


Fig. 2. Food items of a nestling.

● Conservation issues

While stop-gap measures such as artificial feeding and nest box installation have taken effect, the habitat conservation has always

lagged behind. The high frequency of inbreeding due to the shortage of suitable breeding habitats would have been caused by the insufficient food resource in the surrounding areas except for the present breeding sites. In national forests embracing most of Blakiston's Fish Owl breeding grounds, efforts have been started to restore their nesting habitat of broad-leaved and coniferous mixed forests by reserving broad-leaved trees (Hayashi 2009a). However, the targeted habitats comprise no more than an extremely small portion of their range. More efforts should be put into the habitat restoration of "Kotankoro-kamui" (Ainu name of Blakiston's Fish Owl) which used to be an icon of primeval forests of Hokkaido for the native Ainu people.

The fatality of young birds due to accidents in human environments also keeps a curb on the population increase and range expansion (Hayashi 1999, Saito 2002). In addition to measures to prevent their road accidents and electrocution on power lines, the restoration of riparian forests to help secure their dispersal from the natal site contributes to reducing their accidental deaths. It is also instrumental in the range expansion to release birds that have recovered from injuries into a habitat with a single bird or a former range (Hayashi 2009 b). The reintroduction of Blakiston's Fish Owls requires a long-term strategy including the use of captive-raised birds in a zoo. Along with habitat restoration, the reintroduction of captive birds to the wild would be urgently needed for the conservation of Blakiston's Fish Owls.

Literature

Collar N.J. (ed.). 2001. Threatened birds of Asia: the BirdLife International red data book. BirdLife International, Cambridge, U.K.
 Hayashi Y. 1999. Past and present distribution of Blakiston's Fish Owl (*Ketupa blakistoni*) in Hokkaido, Japan - Based upon museum specimens. J. Yamashina Inst. Ornithol. 31:45-61. [J+E]
 Hayashi Y. 2009. Close inbreeding in Blakiston's Fish-owls (*Ketupa blakistoni*). J. Raptor Res. 43:145-148.
 Hayashi Y. 2009a. The habitat maintenance is the most important, is it not? :conservation of the Blakiston's Fish Owl. "Conservation of rare birds of Japan." (Satoshi Yamagishi ed.) Pp.75-98, Kyoto University Pub., Kyoto. [J]
 Hayashi Y. 2009b. Translocation of a Blakiston's Fish Owl in northern Hokkaido. Japanese Journal of Conservation Ecology 14:249-261. [J+E]
 IUCN Species Survival Commission. 2008. The IUCN Red List of Threatened Species 2008. <http://www.iucnredlist.org>
 Wildlife Division of Nature Conservation Bureau, The Ministry of the Environment. 2002. Revised edition Red List of Threatened Birds of Japan 2. Birds. Japan Wildlife Research Center, Tokyo. [J]
 Saito K. 2002. Traffic accident of the Blakiston's Fish Owl (*Ketupa blakistoni*) - an examination of wildlife medicine -. The 1st Wildlife and Traffic Research Symposium: 27-30. [J]
 Slaght J.C. & Surmach S.G. 2008. Biology and conservation of Blakiston's Fish-Owls (*Ketupa blakistoni*) in Russia: a review of the primary literature and an assessment of the secondary literature. J. Raptor Res. 42:29-37.
 Takenaka K. 1999. The Blakiston's Fish Owl. "Shiretoko Library (1) Birds in Shiretoko". (Shari Town Shiretoko museum, ed.) Pp.78-125, Hokkaido Shimbunsha, Sapporo. [J]
 Yamamoto S. 1999. The Blakiston's Fish Owl. Hokkaido Shimbunsha, Sapporo. [J]

Languages of literature cited other than English: [J] in Japanese, [J+E] in Japanese with English summary.

Author

Yuko HAYASHI Law Department of Sapporo University

I spent one and a half years in New Zealand far away from Hokkaido, northern Japan, but my affection for Blakiston's Fish Owls was so strong that I could not help coming home to see them as many as three times while staying there. I feel my happiness in continuing to serve them in my love without reward.

hayashiy@sapporo-u.ac.jp

