Japanese Murrelet Kanmuri-umisuzume (Jpn) *Synthliboramphus wumizusume*

Morphology and classification

Classification: Charadriiformes Alcidae

Total length:	220-265mm (60)	Tail length:	139-213g (214)
Wing length:	113-132mm (163)	Tail length:	19-42mm (152)
Culmen length:	13.8-17.8mm	Bill depth:	6.7-8.6mm (124)
Tarsus length:	23.2-27.8mm (152)		

Quoted from Ono (1996). (Average, maximum-minimum, number of samples) of data in Biroujima Isl. of Kadokawa Town, Miyazaki Pref. from 1993 to 1995.

Appearance:

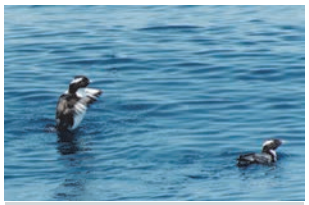


Photo 1. Japanese Murrelets. [Photo by Yoshiharu Suzuki]

Male and female are the same in plumage. The forehead, lore, cheek, and flank are black. The back is gray. The nape and underpart from chest to belly are white. Breeding plumage has black crown feathers 3-5cm long. Ancient Murrelets *S. antiquus*, which are closely related to Japanese Murrelets, on the other hand, lack these crown feathers. The bills of Japanese Murrelets are bluish gray, but those of Ancient Murrelets look white, shorter and somewhat thick. Both species have a white throat in breeding plumage, but this white part extends into the neck in Ancient Murrelts, but not in Japanese Murrelets. In the non-breeding seasons, the crown feathers of Japanese Murrelets become shorter and the area around an eye is white with the upperparts pale gray.

Vocalization:

They call like "Chui, Chui, Chooi …" or "Pidju, Pidju ...". and “Chieet".

Distribution and Habitat

Distribution:

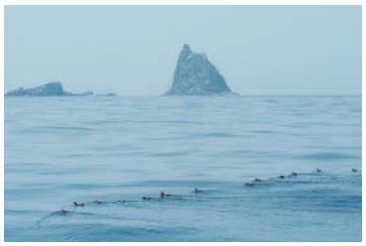


Photo 2. Japanese Murrelets swim against a background of Onoharajima Island, Izu. [Photo by Yoshiharu Suzuki]

Japanese Murrelets are distributed from Taiwan, and Ishigakijima and Iriomotejima Islands of Okinawa (24° N) to the Nemuro Peninsula, and Shikotan and Sakhalin Islands (50° N), but they are concentrated in the northwestern part of the Sea of Japan and southern South Korea.

Habitat:

In the breeding season, they stay in the waters around the breeding grounds, but they spend the non-breeding season far away from the breeding grounds. They range in the waters with surface temperatures between 8 and 22°C throughout the year (Gaston & Jones 1998). Little is known about their ecology of the non-breeding season.

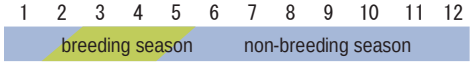
Breeding habitat:

Japanese Murrelets breed only on the reefs and the remote islands of Japan and southern South Korea. Six of seven species of Alcidae breed in Hokkaido and a part of Tohoku region, but Japanese Murrelets are the only murrelet species that breed in the temperate waters from Torishima of the Izu Islands (30° N) to Nanatsujima Island, Ishikawa Prefecture (37° N). They build nests on reefs or cliffs free from waves, sedge grasslands, forest floors and gaps in artificial structures, such as the stone wall of a lighthouse on a remote island.

The largest breeding colony of Japan is located on Biroujima Island, Miyazaki Prefecture, which accommodates approximately 3000 birds. It is followed by the Izu Islands that hold about 1000 birds. They also breed on Koyajima of Chikuzen Okinoshima Islands, Fukuoka Pref., Mimianajima Island, Mie Pref., Koushima Island, Kochi Pref. and other islands. They are estimated to be 5000 to 6000 birds (Ono 1995, 1996). In the Izu Islands, the breeding is confirmed in a total of nine locations, such as Tadanaejima and Onbasejima of Kozu Island, Onoharajima of Miyake Island and Hanshima of Niijima Island (Carter et al. 2002). In addition, family groups have been observed recently in the western area of the Inland Sea (Setouchi region), which suggests the breeding possibility (Iida 2010).

Outside of Japan, Japanese Murrelets were recorded to breed on Gukholdo Islands, southern South Korea (Won 1984), and a corpse of a juvenile Japanese Murrelet was found in the Bay of Peter the Great, Russia in July 1984, which suggests a possibility that a small number of them breed in this area (Nazarov & Shibaev 1987).

Life history



Breeding system:

Japanese Murrelets are basically monogamous. They start to appear in the sea surrounding their breeding grounds in late January or February in the Izu Islands. The first age of breeding is not known. Mating is poorly known, but the observations of two birds in a nest with no eggs (Nakamura & Ono 1997) and apparent mating in a nest (Ono 1993) suggest that copulation may occur in a nest.

Nest:

Japanese Murrelets nest in a gap in a rock, a crack in a cliff, at the root of grass such as sedge, in a ground depression and a gap in a man-made structure such as the stone wall of a lighthouse. They not only lay eggs in these sites without building a nest but also dig a burrow in the ground or use an old nest of other bird species (Higuchi 1979).

Clutch size, and size and color of eggs:

The clutch size of Japanese Murrelets is 1-2 eggs. Major axis of the egg is 54.1 ± 1.5mm by 34.7 ± 1.0mm, with weight of 35.6 ± 2.6g (Ono 1996). The egg accounts for as much as 22% of female body weight. The eggs have reddish dark brown, blackish brown and gray-blue speckles on an off-white, pale red-brown, gray-blue and light brown grounds.

Incubation and nestling periods, and hatching rate:

The egg-laying begins from mid to late March on Biroujima Island. Two eggs are usually laid and the incubation starts when the first egg is laid, but the first egg is incubated only during the night until the second egg is laid, when male and female begin to take turns incubating eggs continuously. After a month incubation the two eggs hatch at almost the same time in late April or early May (Ono 1996). Hatching rate was reported to be about 60% from Koyajima Island, Fukuoka Prefecture. (the Research Division of the Wild Bird Society of Kitakyushu 1978).

The chicks leave the nest for the sea during the night one or two days after hatching, guided by the call of the parent birds (Ono 2010). It is not until they are out on the sea that parent birds feed their chicks, but the rearing period is not known.

The breeding starts later on the Izu Islands, Tokyo than Biroujima Island. The chicks hatch from early to mid May, and the family, thereafter, move elsewhere from the waters around the breeding

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grounds. It is poorly known where Japanese Murrelets spend the non-breeding. However, the information collected through the Internet (the Wild Bird Society of Japan 2010) and by-catch data (Piatt & Gould 1994) confirmed them off the coasts of Sanriku of Tohoku region, as well as the eastern and southeastern Hokkaido, northern Japan. This suggests that they moved north from the Izu Islands or more southern areas.

Diet and foraging behavior

Japanese Murrelets dive into the sea or forage on the surface at the point where two ocean currents meet individually or in a small flock. They were observed to capture small fish such as sardines and banded blue-sprat. The stomach content examination confirmed small fish, small shellfish and crustacean larvae (Moyer 1957). There are no other information or data about their feeding habits and foraging behavior.

Topics of ecology, behavior and conservation

Offshore distribution of Japanese Murrelets in the breeding season

Data on the offshore distribution of Japanese Murrelets around the breeding sites have been collected gradually by the Wild Bird Society of Japan. On Onoharajima Island of Miyakejima Island, for instance, about 80% of Japanese Murrelets observed foraged within 6km of their breeding ground in the breeding season of 2009 (Fig.1). The density of the murrelets was higher in the area less than 4 km of the breeding ground.

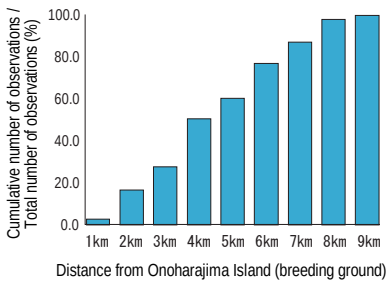

Fig. 1. Distribution of Japanese Murrelets in the area around the breeding ground.

We carried out a simultaneous survey of this species on five fishing vessels off the Izu Islands (Miyakejima, Mikurjimaa, Kozushima, Niijima Islands, and Mikomotojima Island of the Izu Peninsula), and counted at least 441 birds in April 2010. Considering that we failed to detect a fairly large number of them, measures such as increasing survey courses need to be taken to improve detection accuracy in the future.

Contributory factors to the reduction of Japanese Murrelets

Censuses from a passenger liner that operates on a fixed schedule indicated that Japanese Murrelets declined in the waters between Niijima and Oshima Islands of the Izu Islands (Mochizuki and Ueta 1996). It was also reported that they ceased to breed on Shikinejima and Kozushima Islands (Carter et al. 2002).

The decline of this species are attributed to the predation of eggs, chicks and adult birds by crows attracted to the chum or food scraps left by anglers who landed on the breeding islands. In addition, it was reported that brown rats catastrophically damaged the breeding colony on Koyajima Island, Fukuoka Prefecture (Takeishi 1987). The entry of people to the breeding grounds leads to increasing the chances that the murrelets desert their nests and rats intrude there.

Entanglement in fishing nets is also responsible for the population decline. Japanese Murrelets were reported to be entangled in gill nets of squids in the area at 40-42° N and 143-146° E from August to November (Piatt & Gould 1994). The entanglement in gill nets of flying fish was also reported from the Izu Islands (Ono 1997). In addition, mortalities due to oil pollution were reported (Sato 1999, Committee of the Oil Pollution Damage on Seabird 2001).

In order to conserve this species, it is necessary to control predators in the breeding grounds including thorough management of food scraps attracting them, to arouse the public awareness and to take measures to reduce by-catch in conjunction with the population monitoring.

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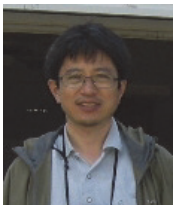

I started working in the Wild Bird Society of Japan in 1991. After working as a ranger in nature centers in Hiroshima and Miyakejima Island, I am assigned to the Nature Conservation Division since 2008. My encounter with Japanese Murrelets is when participating in the offshore survey in one of the breeding grounds of Onoharajima of Miyakejim Island in 1994. I would like to conserve this species firstly by understanding the current status of their breeding grounds in the Izu Islands. We received grants for the offshore survey from Nippon Foundation and the Student Birdathon Committee. I would like to thank them in this opportunity. y-yamamoto@wbsj.org