

Migration

ON THE MIGRATION ROUTE OF SWANS IN HOKKAIDO, JAPAN

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Introduction

It is well known that more than several thousand *Cygnus cygnus cygnus* and about a thousand *Cygnus columbianus bewickii* winter in Japan. Recently a few *Cygnus columbianus columbianus* have been reported. There is general agreement on the migratory routes of *C. c. cygnus* along the northern coast of Hokkaido, the Sea of Okhotsk and the Pacific coast of Honshu. On the other hand, there is no established theory on the migration route of *C. c. bewickii* and it is not clear whether it reaches Honshu after coming down to the Gulf of Aniva from Sakhalin or goes back by the same route.

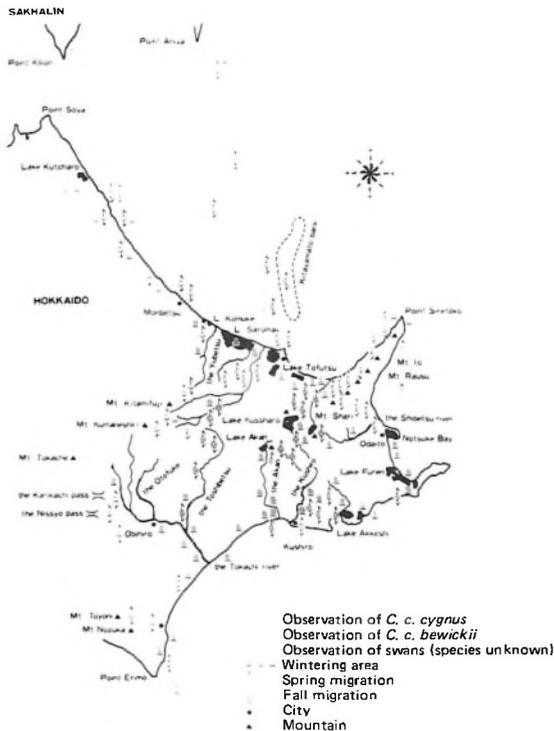


Fig 1. Observations of migrating swans in eastern Hokkaido.

One of the authors observed thousands of swans at Lake Kutcharo near the coast of the Sea of Okhotsk during the spring and autumn migration periods.

As the result of many observations we found the migration route of *C. c. bewickii* follows a line joining the Teshio River, the Ishikari River, Lake Utonai in Tomakomai City and the Shimokita Peninsula in the northernmost tip of Honshu. Sighting points of migratory swans, temporary resting areas and wintering grounds of swans in Hokkaido are plotted in Figs 1 and 2. We concluded that there were three main migration routes in Hokkaido and each route was across the sea and along the coast line.

The migration routes of the swans

Okhotsk–Pacific route

Most swans wintering in Japan come from Point Aniva on Sakhalin to Lake

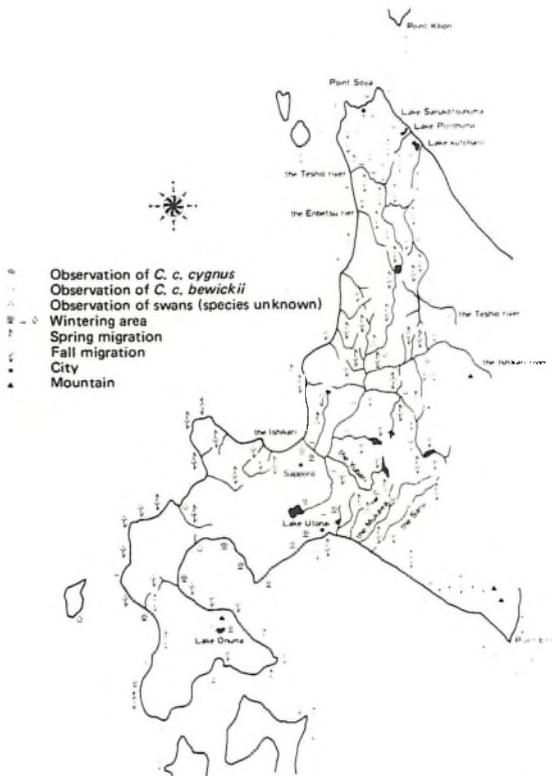


Fig 2. Observations of migrating swans in central and western Hokkaido.

Komuke in Monbetsu City, Lake Tofutsu in Abashiri City and Point Shiretoko in Shiretoko Peninsula. They then move down to Shimokita Peninsula, Aomori Prefecture, via Point Erimo along the coast line of the Okhotsk (Figs 1 and 3).

Some of the migrants arrive at the Plain of Tokachi after crossing the Kitami range and the Ishikari range.

They move continuously southward across near the Karikachi Pass, Nissho Pass, the Hidaka range between Mt Nozuka and Mt Toyoni and reach Lake Utonai on the Pacific coast (Figs 1 and 3). Almost all flocks winter in Lake Utonai but the remainder continue down to the Shimokita Peninsula. The wintering swans in Japan return north on the same route in spring. This course is used mainly by the flocks of *C. c. cygnus* but also by a few *C. c. bewickii*.



Fig 3. Presumed swan migration routes in Hokkaido.

Central axis route

Large flocks of swans arrive at Wakkanai district, northern tip of Hokkaido from Point Klilion in Sakhalin. Most stay at Sarukotsu marsh facing the Sea of Okhotsk, Poro-numa marsh and Lake Kutcharo for a while, then move down to the mouth of the Teshio River which is situated southwest of these areas. A few move to the mouth of the Teshio River. Most move along the main stream and tributaries of the Teshio River, or the Ishikari River, and reach Lake Utonai. After staying for a short period, they fly over to Shimokita Peninsula (Figs 2 and 3).

Most of the *C. c. bewickii* pass along this route, but *C. c. cygnus* is rare. Most of the *C. c. cygnus* that reach Lake Utonai by Route 1 stay there during the winter. Most of the *C. c. bewickii* go south and in spring, on their way back to their breeding ground, they stay in this area for a while. No wintering *C. c. bewickii* are reported here. Most of the flocks which go south from Lake Utonai set course for Shimokita Peninsula. In autumn some of them go south, and in spring, north, along the coast of the Pacific Ocean (Figs 2 and 3).

C. c. cygnus is usually observed on this coastal route. However, just a small number of *C. c. bewickii* that fly down or stay on this route are observed at Lake Onuma in the southern part of Hokkaido (Fig 2), so it is presumed that *C. c. bewickii* passes along the route on the Pacific Ocean.

Sea of Japan route

The third route starts downstream of the Teshio River and terminates at Tsugaru Peninsula on Honshu along the coast of the Sea of Japan. Among these, some reach the plain of Ishikari via the Teshio range, others from Ishikari Bay. After that they go to the Shimokita Peninsula from Lake Utonai. On the other hand, some flocks go farther south from Suttso Bay to Tsugaru Peninsula across the central region of Oshima Peninsula and Funka Bay of southern Hokkaido. In spring they go back north along the same course (Figs 2 and 3). Both *C. c. cygnus* and *C. c. bewickii* migrate along this route but the exact ratio is still not known.

Short cuts

In these three migration routes some swans go round the Peninsula, others take short cuts. On Route 1 there are several short cuts, one over the col of the Shiretoko Peninsula and three over the cols of the Hidaka range. On Route 3 they cross at two points at the base of Shyakotan Peninsula and some reach Funka Bay across the base of Oshima Peninsula from Suttso Bay. Some also fly over the Kariba range from Funka Bay to the Sea of Japan.

Temporary resting on the sea

Several hundred swans on Route 1 were observed at rest on the sea near Point

Shiretoko in spring and some flocks on the floating pack ice in the Sea of Okhotsk. On Route 3 there are some flocks of *C. c. cygnus* and of *C. c. bewickii* every spring on the water 3 to 5 km off Ishikari Bay. From this it can be supposed that not all flocks fly over the Sea of Okhotsk or the Sea of Japan in one stretch.

Flying speed on migration

We used automobiles to follow flocks of swans that move round during the migratory season and we could catch up with them at a speed of 100 km/h. At this time it was windless. In a fair wind, they would fly faster.

Movement of neck-banded swans

A *C. c. cygnus*, IC22, banded at Kominato, Aomori Prefecture, in March 1977 appeared at Lake Akkeshi on 12 March 1977 and at Lake Tofutsu on 14 March 1977



Fig 4. Resightings in Japan of *C. c. cygnus* neck-banded IC22.

1977; it returned to Kominato Bay on 29 December 1977 and to Lake Tofutsu in March 1978 (Fig 4, Table 1). IC05, banded at Kominato Bay on 23 March 1975, appeared at Notsuke Bay on 4 January 1976 and at Kominato Bay on 27 January 1976. IC45, banded at Kominato Bay on 8 March 1978, was at Lake Utonai on 16 March 1978, at Ominato Bay on 10 February 1979 and at Lake Utonai on 4 March 1979 (Fig 5). IC60, banded at Lake Utonai on 1 March 1978, appeared at Lake Tofutsu on 7 December 1978 and at Lake Utonai on 10 December 1978. It stayed there till 4 March 1979. The following winter it was at Lake Utonai till 28 March 1980 and on 29 March 1980 it appeared at Lake Tofutsu (Fig 5). These sightings prove the presence of Route 1, ie the route connects Lake Tofutsu, the Pacific Ocean and Shimokita Peninsula.

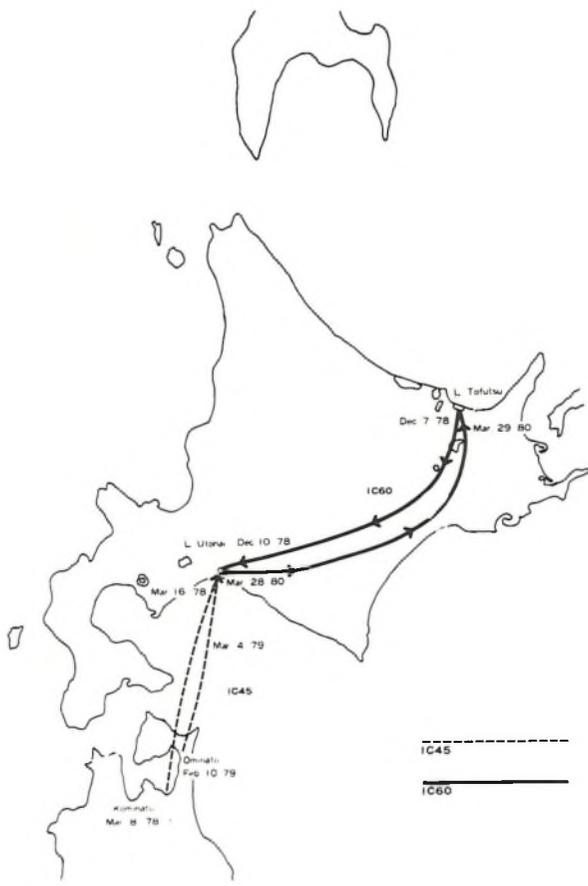


Fig 5. Resightings in Japan of neck-banded *C. c. cygnus*.

Year	1976			1977			1978		
Ring no									
IC02	* Mar 15 L. Tofutsu	Mar 13 L. Tofutsu				Nov 16 L. Kussyaro		Mar 13 Apr 2 L. Tofutsu	
IC11	Dec 2 L. Tofutsu	Jan 3 L. Tofutsu	Mar 27 Notsuke B	Mar 31 Apr 8 L. Tofutsu			Jan 4 Mar 26 Notsuke B	Apr 1 27 L. Tofutsu	
IC22		* Feb 13 Mar 1 Kaminato	Mar 12 L. Akkeshi	Mar 14 Apr 7 L. Tofutsu	Nov 12 Dec 24 L. Tofutsu	Dec 29 Kaminato		Mar 25 Apr 22 L. Tofutsu	
IC26		* Feb 13 Mar 28 Kaminato		Apr 4 L. Toro					
IC27		* Feb 13 Mar 1 Kaminato	Mar 14 Apr 5 L. Tofutsu						

* ringing date

Year	1975	1976		1978			1979	
Ring no								
IC05	* Mar 23 Kaminato	Jan 4 Notsuke B	Jan 27 Kaminato					
IC45				* Mar 8 Kaminato			Feb 3 Ominato B	Mar 4 L. Utonai
IC96				* Mar 11 L. Utonai	Dec 7 L. Tofutsu	Dec 10 L. Utonai	* Mar 8 Notsuke B	Jan 14 L. Tofutsu

Table 1. Resightings in Japan of neck-banded *C. c. cygnus*

Year	1978			1979		
Ring no						
006C	Nov. 1 L. Utonai	Nov. 4 L. Izunuma	Nov. 11 L. Toyanogata	Jan. 24 Abukuma r.	April. 23 L. Utonai	
014C		Nov. 22 Abukuma r.		Jan 7~Mar. 20 L. Izunuma		Apr. 3 L. Kutcharo
015C	Nov. 1 L. Utonai	Nov. 3 L. Toyanogata				
023C	Nov. 4 L. Sarukotsu		Dec. 26 L. Fukushima gata	Mar. 10 L. Hyoko	Apr. 1 L. Utonai	Apr. 23 L. Kutcharo
030C	Nov. 8 L. Izunuma	Nov. 11 L. Toyanogata			Mar. 25 L. Utonai	
034C	Nov. 8 L. Izunuma	Nov. 11 L. Toyanogata			Mar. 25 L. Utonai	Apr. 8 L. Kutcharo
037C	Nov. 4 L. Hyoko	Nov. 7 L. Izunuma	Dec. 29	Jan. 7~ Mar. 20 L. Izunuma	Apr. 1 L. Utonai	
051C	Nov. 3 L. Sarukotsu	Nov. 12 L. Kutcharo	Nov. 18 L. Hyoko	Feb. 18 L. Hachrogata		
052C	Nov. 3 L. Sarukotsu	Nov. 12 L. Kutcharo	Nov. 18 L. Hyoko	Feb. 18 L. Hachrogata		
053C	Nov. 3 L. Sarukotsu	Nov. 12 L. Kutcharo	Nov. 18 L. Hyoko	Feb. 18 L. Hachrogata		

Table 2. Resightings in Japan of neck-banded *C. c. bewickii*

A *C. c. bewickii*, 023C, was observed at Lake Sarukotsu in November 1978, at Fukushimaagata on 26 December 1978, and at Hyoko on 10 March 1979, at Lake Utonai on 1 April 1979 and at Lake Kutcharo on 23 April 1979 (Table 2). 006C was observed at Lake Utonai on 1 November 1978, at Izunuma on 4 November 1978, at Toyanogata on 11 November 1978, at Lake Inawashiro from 24 January to 2 February in 1979 and at Lake Utonai on 24 April 1979 (Table 2, Fig 6).

These two examples prove the existence of the central axis route through Lake Sarukotsu, north Hokkaido, and Lake Kutcharo and Lake Utonai.

The movement of 006C in Fig 6 shows that there is a route between the Pacific Ocean and the Sea of Japan and all of these facts have been proved by banding research for the first time. As far as Route 3, along the coast of the Sea of Japan in Hokkaido, is concerned, no banded individual has been discovered. But we can assume the existence of the route because of many reports by many observers, by dead bodies and by photographs of individuals sheltering. The ratio of the two

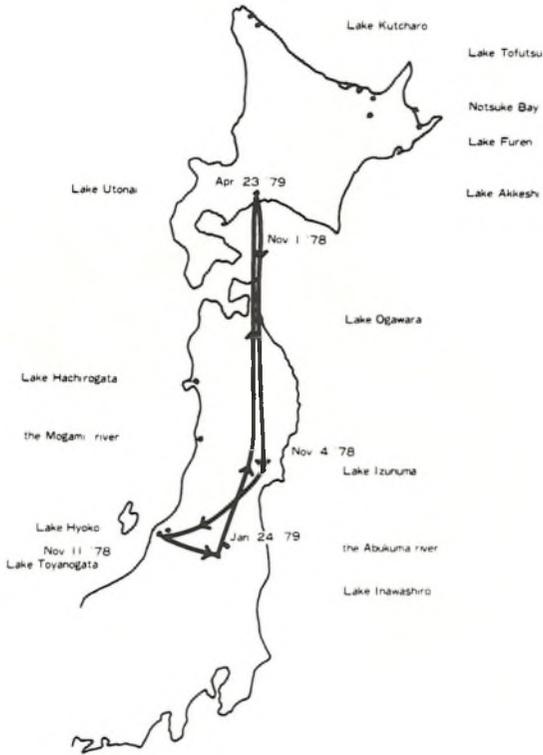


Fig 6. Resightings in Japan of *C. c. bewickii* neck-banded 006C.

routes coincided with the shoreline in the Pliocene. We might well think that the route lies across the ancient sea or shoreline. Judging from the movement of shoreline, the route is assumed to be wide.

Consideration from literature

Much has been reported on migratory routes of swans since 1924 (Fig 8). Most of them concern *C. c. cygnus*. Dr Udagawa suggested in 1967 by pictures that *C. c. bewickii* migrates along the shoreline course or the Sea of Okhotsk and the Pacific Ocean in Hokkaido, but in relation to the *C. c. bewickii* in north Hokkaido, it has been proved that just a small number of them can be seen among the flocks of *C. c. cygnus* (Hatta 1924). The route suggested by Dr Udagawa has not been proved yet. The shoreline routes suggested by lots of experts are in accordance with the results of our research. The route between Shimokita Peninsula and Point Erimo suggested by Dr Mikami has been backed up with the observations of swans at sea along the route (Figs 1 and 2). But in relation to the route between Lake Saroma and Sakhalin, there are no observations which afford proof.

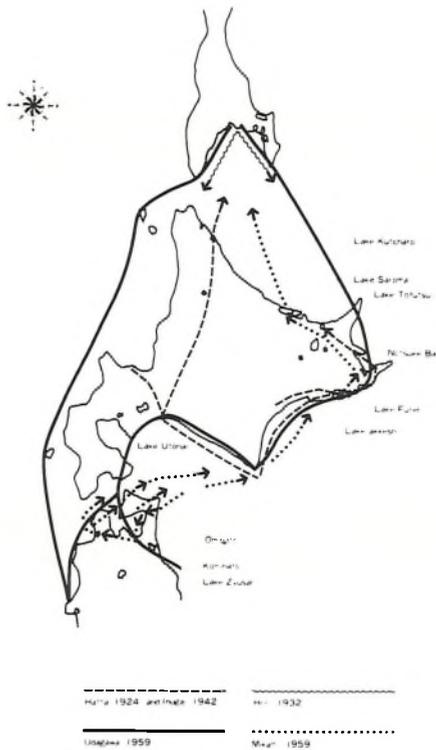


Fig 8. Swan migration routes presumed by earlier observers.

Dr Hatta stated in 1924 that *C. c. cygnus* moving from Lake Utonai to Lake Kutcharo at Hamatonbetsu were the ones that came from Lake Furen and he insisted that they flew to Lake Kutcharo instead of going back to Lake Furen. However, this is the route along which *C. c. bewickii* is mainly moving in spring and autumn, so *C. c. cygnus* is rare. Besides, no banded *C. c. cygnus* has been observed in Lake Kutcharo. Furthermore, no banded individuals that come to Lake Utonai from Lake Tofutsu, located in the south of the Sea of Okhotsk, fly to Lake Kutcharo. Judging from this, flocks of *C. c. cygnus* that came to Lake Utonai from the Okhotsk side of east Hokkaido in autumn cannot be assumed to fly to Kutcharo along the central axis.

Conclusion

We have proved three migration routes of swans – the route between the Sea of Okhotsk and the Pacific Ocean, the route of the central axis and the coastal route by the Sea of Japan – by getting information from many people, from observations of banded individuals and from literature. Finally, the proof of these routes is not complete and we are going to continue our research and observations.

Summary

The paper reviews observations of migrating swans in Hokkaido and defines three routes used by *Cygnus columbianus bewickii*. Observations of neck-banded swans confirm the use of the routes and possible relationship of the routes to paleogeographical conditions is suggested.

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THE COLD AIR CURRENT IN THE KHABAROVSK AREA AND THE CORRELATION WITH SWAN NUMBERS AT LAKE HYOKO, JAPAN

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Introduction

Every winter Lake Hyoko, which is the birthplace of swan protection and is desig-