
LIFE SPAN OF WHOOPER SWAN (*Cygnus cygnus cygnus*) AND
JANKOWSKIS SWAN (*Cygnus columbianus jankowskii*)

By KIYOSHI HONDA

No respect has been discovered which distinguishes the age of the adults of Whooper Swan and Jankowskis Swan. I tried to elucidate the average life span of these two kinds of swans by analyzing the following two materials learned from the field observation. The one is the percentage of adults and juveniles of the whole migratory birds: the other is the rate of natural selection of juveniles.

First, I'd like to examine the percentage of adults and juveniles in a flock. As for Jankowskis Swan, the adults amount to between 57 % and 75 % (69.5 % on the average), while the juveniles amount to between 25 % and 43 % (30.5 % on the average).

Second, about the rate of juveniles' natural selection, a colour markings clearly tells that 4 juveniles (of two broods of 10 juveniles) survived till the migration season. That is, the rate of weeding out is 60 %. (see Table 1, 2) Judging from this reasoning, the number of adults will be 30 (69.76 %) and that of juveniles 13 (30.23 %) of all the Swans in the 1st year (43 swans in all). This result is roughly consistent with the average in the actual field.

Furthermore, we suppose that they come to have procreative power from the 3rd year, and that in this case 13 juveniles family is composed of 2 broods of 10 juveniles (5 for each brood) and a brood of 3 juveniles. (This assumption is near to the average component of one family learned by the anniversary observation.)

And on this assumption we add another datum which tells that the rate of weeding out till the begging of the 2nd year is 60 % to get the result that 5 juveniles survive as so many 2 aged middle juveniles.

If we compose a pyramid style figure (construction of the group of swans in order of age) on the base of these 5 middle juveniles, and if the number of selected adults is 5 (see Fig. 1), we can get the result that in the 2nd year the number of adults (including middle juveniles) is 30, so the balance is kept. Therefore, in relation to the procreation coefficient of juveniles, if this cycle is maintained, the whole number of Jankowskis Swan is kept the same.

Here, I would like to add another material. By "the Investigation Report on Hurt, Sick, and Dead Swans" (the Swan Society of Japan: 1977, 78), the number of so-called weeded-out swans was 257. (This investigation report, however, is based on the reports from only 18 migration place, so it does not mean the whole number.) The number of weeded-out adults and juveniles was in the ratio of 27 : 42 (= 39.4 % : 60.6 %). This numerical value is very near to that of Figure 1.

Surely it is difficult to conclude that the actual condition of the whole swans is directly reflected in this result. But it may be helpful in examining the relation between breeding and selection.

Judging from these results, the peak of Figure 1 (the pyramid) is 10 years, and so we may presume the average life span.

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Table 1. The number of weeded-out adults and juveniles.

Year	'76~'77	'77~'78	Total	Numerical Value on Fig. 1	Deviation
Adults	12	15	27	5	± 0.075
Juveniles	23	19	42	8	± 0.075

From the Swan Society of Japan "The Investigation Report on hurt, sick, and dead Swans".

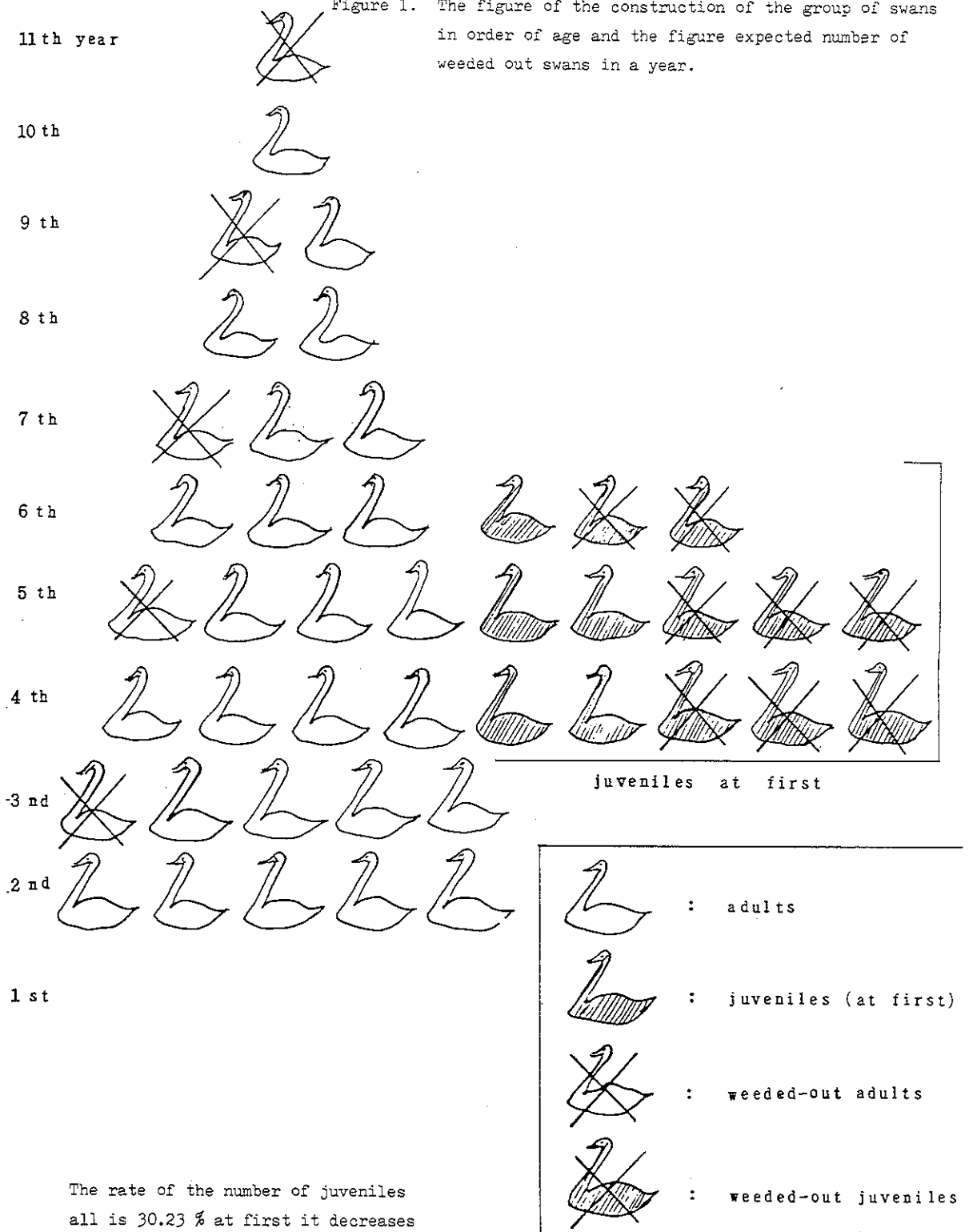
Table 2. The Comparison between the percentages of actual observation and Fig. 1.

	Observation	Figure 1
Number of adults	57 % ~ 75 % (69.5 % on the average)	69.8 %
Number of juveniles	25 % ~ 43 % (30.5 % on the average)	30.2 %
Number of adults in weeded-out swans that of juveniles	39.4 % 60.6 %	38.5 % 61.5 %
A	40 %	38.5 %
B	60 %	61.5 %

Rate of A : Number of survived swans in the whole juveniles which left the nest

B : that of weeded-out ones; 100-A

Figure 1. The figure of the construction of the group of swans in order of age and the figure expected number of weeded out swans in a year.



The Investigation Report on Hurt, Sick, and Dead Swans.

Investing Locations	Date	Species	Age	Sex	Weight	Count
Odai-To	-	Cy Cy	-	-	-	100
O-Numa	15 Jan. 77	"	Ad	-	-	1
Hira-Kawa	22 Dec. 76	"	-	-	-	1
"	7 Jan. 77	"	-	-	-	1
"	9 Jan. 77	"	-	-	-	1
"	9 Jan. 77	"	-	-	-	1
"	25 Jan. 77	"	-	-	-	1
"	30 Jan. 77	"	-	-	-	1
"	6 Feb. 77	"	-	-	-	1
"	23 Feb. 77	"	-	-	-	1
"	7 Mar. 77	"	-	-	-	1
Shizukuishi-Gawa	22 Mar. 77	"	-	-	-	1
Mogami-Gawa mouth of a river	2 Jan. 77	"	-	-	-	1
"	29 Mar. 77	"	-	-	-	1
Izu-Numa	-	"	-	-	-	2
"	-	"	-	-	-	2
"	-	Cy Co	Juv	-	-	1
"	-	Cy Cy	-	-	-	3
"	-	"	-	-	-	1
"	-	Cy Co	-	-	-	1
"	-	"	-	-	-	1
"	-	Cy Cy	-	-	-	1
Fuji-Numa	-	-	Ad	-	-	1

(The Swan Society of Japan, 1977 & 78)

Conditions, management and the cause of death.	Investigator
The carcasses amounted to about 100.	J. Miura
The carcass was accommodated, The cause of death was unknown.	H. Kakizaki
" , stuffed.	K. Kafuku
The injured swan was protected and treated.	"
Struck an electric wire to injury, Protected, Set free on Mar. 10.	"
Killed by an electric shock.	"
The injured swan was protected. Set free on Mar.10.	"
Struck an electric wire to death.	"
Killed by an electric shock.	"
The injured swan was protected.	"
"	"
The carcass was accommodated, The cause of death was unknown.	S. Takahashi
Killed by an electric shock.	S. Kijima
The carcass was accommodated, The cause of death was unknown.	"
Weakened to death.	Y. Yokota
The Wings were fractured, Under medical treatment.	"
The weakened swan was protected, After recovered, set free with (140-00504).	"
Killed by an electric shock.	"
Shot to death.	"
"	"
Killed by an electric shock.	"
Weakened to death.	"
The carcass was accommodated, The cause of death was unknown.	K. Tanaka

Investing Locations	Date	Species	Age	Sex	Weight	Count
Fuji-Numa	-	-	Juv	-	-	1
Naruse-Gawa	19 Feb. 77	Cy Cy	-	-	-	1
Abukuma-Gawa	-	"	Ad	-	-	1
"	-	Cy Co	"	-	-	1
Inawashiro-Ko	1 Dec. 76	"	Juv	-	-	3
"	4 Jan. 77	"	"	-	-	1
"	7 Jan. 77	"	Ad	-	-	1
"	15 Jan. 77	"	Juv	-	-	2
"	17 Jan. 77	"	Ad	-	-	1
"	18 Jan. 77	"	Juv	-	-	1
"	19 Jan. 77	"	"	-	-	1
"	23 Jan. 77	"	Ad	-	-	1
"	11 Feb. 77	"	-	-	-	1
"	17 Feb. 77	"	-	-	-	1
"	22 Feb. 77	"	-	-	-	1
"	22 Feb. 77	"	-	-	-	3
"	3 Mar. 77	"	-	-	-	1
"	5 Mar. 77	"	-	-	-	1
"	9 Mar. 77	"	-	-	-	1
"	15 Mar. 77	"	-	-	-	1
"	17 Mar. 77	"	-	-	-	2
"	20 Mar. 77	"	-	-	-	2
"	29 Mar. 77	"	-	-	-	1
Fukushima-Gata and in this neighborhood	17 Mar. 77	Cy Cy	-	-	-	2
"	21 Mar. 77	"	-	-	-	1
"	5 Apr. 77	"	-	-	4.5 kg	1
"	5 Apr. 77	"	-	-	-	1

Conditions, management and the cause of death.	Investigator
The carcass was accommodated, The cause of death was unknown.	K. Tanaka
"	Y. Ogawa
"	J. Uetake
"	"
The carcasses were accommodated.	T. Ohmori
The carcass was accommodated.	"
"	"
The carcasses were accommodated.	"
The carcass was accommodated. Bitten by a dog.	"
Killed in a traffic accident at the national road 49.	"
Touched a high-tention wire to death.	"
The carcass was accommodated. Weakened to death.	"
Protected and treated. Set free on Feb. 13.	"
The carcass was accommodated.	"
Protected and treated. Set free on Feb. 23.	"
The carcasses were accommodated. The cause of death was unknown.	"
The carcass was accommodated. Frozen to death.	"
The carcass was accommodated. The cause of death was unknown.	"
The decomposed body was accommodated.	"
Struck a train to death.	"
The decomposed bodies were accommodated.	"
The carcasses were accommodated. The cause of was unknown.	"
The skeletal remains were accommodated.	"
The sick swans were accommodated to the Lake Hyo, but died. The cause of death was unknown.	Niigata Pref
The carcass was accommodated. Trauma.	"
Killed by an electric shock.	"
"	"

Investing Locations	Date	Species	Age	Sex	Weight	Count
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Hyo-Ko and in this neighborhood	21 Dec. 76	Cy Cy	Juv	-	-	1
"	3 Jan. 77	"	"	♂	-	1
"	10 Jan. 77	"	"	♀	-	1
"	17 Jan. 77	"	"	-	-	1
"	7 Feb. 77	"	"	-	-	1
"	19 Feb. 77	"	"	♀	-	1
"	27 Feb. 77	"	-	-	-	1
"	6 Mar. 77	"	Ad	♂	-	1
"	15 Mar. 77	"	"	♂	-	1
"	23 Mar. 77	"	-	-	-	1
"	28 Mar. 77	"	Juv	♀	-	1
"	30 Mar. 77	"	"	♂	5.8 kg	1
Toyano-Gata and in this neighborhood	11 Nov. 76	"	-	-	-	1
"	26 Feb. 77	Cy Co	Juv	-	3.0 kg	1
"	28 Feb. 77	"	"	-	2.2 kg	1
"	12 Mar. 77	Cy Cy	-	-	-	1
Sa-Gata and in this neighborhood	14 Jan. 77	Cy Co	Ad	-	-	1
"	24 Jan. 77	"	-	-	-	1
"	27 Feb. 77	"	-	-	-	1
"	28 Feb. 77	"	Ad	-	4.1 kg	1
"	28 Feb. 77	Cy Co	Juv	-	2.8 kg	1
"	4 Mar. 77	Cy Cy	"	-	4.3 kg	1
"	9 Mar. 77	"	-	-	4.2 kg	1
"	18 Mar. 77	"	Juv	-	6.5 kg	1

Conditions, management and the cause of death.	Investigator
The carcass was accommodated. The cause of death was unknown.	Niigata Pref
Died after accommodation. Staphylococcus	"
The carcass was accommodated. Escherichia coli	"
Touched an electric wire and fell on the earth. Accommodated to the Lake Hyo. Later set free.	"
Weakened. Protected at the Lake Hyo.	"
The carcass was accommodated. The cause of death was	"
The sick swan was accommodated to the Lake Hyo. Later set free.	"
The carcass was accommodated.	"
The cause of death was	"
" was	"
" was trauma.	"
Died after accommodation. gastrickglands	"
The carcass was accommodated. The cause of death was	"
The injured by a gun was accommodated to the Lake Hyo. Later died.	"
The carcass was accommodated.	"
The cause of death was colitis (008C red label).	"
" was unknown (007C red label).	"
"	"
"	"
The carcass was accommodated.	"
Killed by an electric shock.	"
" Weakened to death.	"
" "	"
" Embolism	"
"	"
" The cause of death was trauma.	"

Investing Locations	Date	Species	Age	Sex	Weight	Count
Asahi-Ike	12 Dec. 76	Cy Cy	-	-	-	1
"	20 Mar. 77	"	-	-	-	1
"	5 May 77	"	-	-	-	1
Kotoku-Numa	13 Jan. 77	"	-	-	-	1
"	28 Feb. 77	"	-	-	-	1
Naka-Umi		Cy Co	-	-	-	1
"		"	-	-	-	2
"		"	-	-	-	2
"	17 Nov. 76	Cy Co (005Y)	Ad	-	-	1
The Bay of Aomori	-	Cy Cy	-	-	-	5
Hira-Kawa	21 Jan. 78	-	-	-	-	1
	29 Mar. 78	-	-	-	-	1
Shizukuishi-Gawa	-	Cy Cy	Ad	-	-	3
"	-	"	Juv	-	-	1
"	-	"	"	-	-	1
"	-	"	Ad	-	-	1
Mogami-Gawa mouth of a river	-	-	-	-	-	7
Izu-Numa, Uchi-Numa	10 Dec. 77	Cy Co	-	-	-	1
"	28 Jan. 78	Cy Cy	Ad	-	-	1
"	12 Mar. 78	Cy Co	Ad	-	-	1
Inawashiro-ko	26 Jan. 78	"	-	-	-	1
"	26 Jan. 78	"	-	-	-	1

Conditions, management and the cause of death.	Investigator
The carcass was accommodated. The cause of death was trauma.	Niigata Pref
" " was pyloric losing.	"
" " was trauma.	"
The injured swan was accommodated to Protected. After recovered. Set free with (140-00503)	" S. Goto
The carcass was accommodated. The cause of death was unknown.	M. Kadowaki
" " trauma.	"
The sick swans were accommodated, protected and treated. After recovered, set free.	"
Died after accommodation. The cause of death was unknown.	"
Died in Gotsu City.	"
The carcasses were accommodated.	M. Saito
The sick swan was accommodated. Later died. Stuffed.	K. Kafuku
" " Burned.	"
Struck an electric wire to death.	A. Yoshizato
Touched a high-tension wire. The left foot was injured. After treatment set free.	"
Struck an electric wire. After treatment set free.	"
" The right wing was injured.	"
Killed in accidents.	S. Kijima
The cause of death was aspergillosis.	Y. Yokota
Shot to death.	"
Weakened to death.	"
After accommodation, treated. But died on the next day.	T. Ohmori
Frozen to death. The carcass was accommodated.	"

Investing Locations	Date	Species	Age	Sex	Weight	Count
Inawashiro-ko	3 Apr. 78	-	-	-	-	1
"	-	Cy Co	Juv	-	-	1
Fukushima-Gata and in this neighborhood	4 Jan. 78	Cy Cy	Juv	♀	-	1
"	10 Jan. 78	Cy Co	-	-	-	1
"	20 Jan. 78	Cy Cy	Juv	♂	6.6 kg	1
"	28 Jan. 78	"	Ad.	♂	-	1
"	8 Feb. 78	"	Juv	♀	4.0 kg	1
"	11 Feb. 78	"	-	-	-	1
"	11 Mar. 78	Cy Co	-	-	-	1
"	11 Apr. 78	"	-	-	-	1
Hyo-Ko and in this neighborhood	25 Dec. 77	Cy Cy	-	-	-	1
"	17 Jan. 78	"	Juv	-	-	1
"	18 Jan. 78	"	Ad	♂	-	1
"	28 Jan. 78	Cy Co	Ad	-	-	1
"	27 Feb. 78	Cy Cy	Ad	♀	-	1
"	9 Mar. 78	"	Juv	♂	5.3 kg	1
"	13 Apr. 78	"	Ad	♂	-	1
Toyano-Gata and in this neighborhood	2 Oct. 77	"	Ad	♀	9.0 kg	1
"	6 Nov. 77	Cy Co	Juv	-	-	1
"	13 Nov. 77	"	Ad	♀	6.1 kg	1

Conditions, management and the cause of death.	Investigator
The carcass was accommodated. The cause of death was unknown.	T. Ohmori
The decomposed body was accommodated.	"
Died after accommodation. The cause of death was	Niigata Pref
Accommodated to the Lake Hyo-Ko and protected.	"
Died after accommodation. The cause of death was	"
The carcass was accommodated. The cause of death was unknown.	"
Died after accommodation. The cause of death was	"
The carcass was accommodated. The cause of death was unknown.	"
Died after accommodation. The cause of death was unknown.	"
The Sick swan was protected.	"
Struck something to death. The carcass was accommodated.	"
Accommodated to the Lake Hyo-Ko and protected.	"
Died after accommodation. The cause of death was	"
The carcass was accommodated. The cause of death was unknown.	"
Died after accommodation. The cause of death was pneumonia.	"
The carcass was accommodated. The cause of death was	"
The carcass was accommodated. Struck something to death.	"
"	"
"	"
Protected. Accommodated to the Birds' Hospital.	"
Struck something to death. The carcass was accommodated.	"

Investing Locations	Date	Species	Age	Sex	Weight	Count
Toyano-Gata and in this neighborhood	7 Mar. 78	-	-	-	-	1
Sa-Gata and in this neighborhood	28 Nov. 77	Cy Co	Juv	-	-	1
"	2 Mar. 78	"	"	♀	4.0 kg	1
"	13 Mar. 78	"	-	♂	7.0 kg	1
Asahi-Ike	27 Mar. 78	Cy Cy	Juv	♀	-	1
Kotoku-Numa	29 Oct. 77	"	"	-	-	1
"	5 Dec. 77	"	"	-	-	1
"	16 Jan. 78	"	Ad	-	-	1
"	16 Jan. 78	"	"	-	-	1
"	17 Feb. 78	"	"	-	-	1
"	5 Mar. 78	"	"	-	-	1
"	14 Mar. 78		Juv	-	-	1
Naka-Umi	-	"	"	-	-	1
"	5 Feb. 78	Cy Co (0380)	"	-	-	1
"	6 Mar. 78	Cy Co	"	-	-	1
"	-	"	"	-	-	1

Conditions, management and the cause of death.	Investigator
The carcass was accommodated. The cause of death was unknown.	Niigata Pref
Protected. Accommodated to the Birds' Hospital.	"
The carcass was accommodated. The cause of death was trauma.	"
The carcass was accommodated. The cause of death was	"
The carcass was accommodated. The cause of death was	"
The carcass was accommodated. The cause of death was unknown.	S. Goto
" "	"
The sick swan was accommodated and treated. But died on Jan. 25.	"
The sick swan was accommodated and treated. But died on Jan. 28.	"
The carcass was accommodated. The cause of death was unknown.	"
" "	"
The carcass was accommodated. The cause of each was unknown.	"
The right wing was fractured in an accident. After treatment set free by the Mihei River in Ota City.	M. Kadowaki
The carcass was accommodated. The cause of death was unknown.	"
The carcass was accommodated. It was sent to Yamaguchi University, School of veterang medicine.	"
Killed in an accident.	"