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Nesting of Trumpeter Swan in the Lower Copper River Basin, Alaska

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least from early May to mid-July. Virtually nothing else is known of the life history of the species.

It is interesting to note that of the thirty reported specimens of the species, twenty were collected by Mario del Toro Avilés within a few miles of Cerro Zempoaltepec. It might also be mentioned parenthetically that Miguel Alvarez del Toro, a resident ornithologist of Tuxtla Gutiérrez, informed us that he is quite certain that he has seen this species in the liquidambar region of the mountains of Chiapas.

We wish to express our thanks to Dr. Alden H. Miller and Dr. Pierce Brodkorb for courtesies extended us.—ROBERT T. MOORE and DON R. MEDINA, *Laboratory of Zoology, Occidental College, Los Angeles, California, March 15, 1956.*

Nesting of Trumpeter Swan in the Lower Copper River Basin, Alaska.—In the summers of 1954 and 1955 field observations were made on nesting Trumpeter Swans (*Cygnus buccinator*) in the lower Copper River Basin, Alaska. Measurement of three abandoned eggs obtained in 1954 afford proof of species identification and establish the existence of hitherto unknown breeding grounds of the species. The nearest proven nesting area is in the vicinity of Grand Prairie in western Alberta.

The Copper River lies in south-central Alaska and is the largest stream discharging into the Gulf of Alaska. The lower portion of this watershed passes through the precipitous glaciated Chugach Mountains. There it is confined to a comparatively restricted valley which broadens as it merges with the flats of the delta. The observations on swans were made in this lower portion between longitude 145°30' and longitude 144°00' W at latitude 61°00' N, where the Bremner and Tasnuna river valleys converge with the Copper River.

An early record of the Trumpeter Swan and its eggs collected in Alaska is that by Mr. Lockhart at Fort Yukon (Dall and Bannister, *Trans. Chicago Acad. Sci.*, 1, 1869:294), but this record is now considered doubtful. Gabrielson (*Auk*, 63, 1946:103) reported one dead bird positively identified as a Trumpeter Swan from Ward's Lake in southeastern Alaska found on April 4, 1945. On September 30, 1949, two swans mistaken for Snow Geese were shot by a hunter in the Chickaloon Flats on the Kenai Peninsula. Both birds were positively identified as Trumpeters. On September 15, 1952, F. Glaser (personal communication) reported seeing two Trumpeter Swans with several cygnets on a small lake in the Gulkana River drainage in the upper Copper River Basin. Mr. Glaser identified these birds as Trumpeters by their call.

On June 9, 1954, a swan's nest containing one egg was observed by me from the air in the lower Bremner River Basin. It was built in a clump of grass in the center of a relatively small, shallow marsh lake. This is the earliest date a nest containing eggs was recorded. No adult swans were seen in the immediate vicinity at that time. That evening, however, a pair of large swans passed about 100 feet over camp. Both birds, perhaps alarmed by our presence, uttered a resonant blaring cry. This incident was repeated on several occasions. Because of their large size and unique cry these birds were believed to be Trumpeters.

On the evening of June 12, two pairs of swans were sighted on a sand bar along the river. Both pairs were performing what was believed to be a courtship dance. The nearer pair, about 150 yards away, stood facing each other. With wings arched but not spread to full length, they proceeded to rotate in a circle while their heads bobbed up and down in rhythmic motion. This dance continued for approximately five minutes before it was interrupted by our attempt to move closer.

On July 28, while conducting aerial salmon surveys on the Bremner River, I sighted six pairs of swans in widely dispersed lakes. Three of the six had young, one pair with six cygnets, and two pair with three each. Although cygnets were not observed with the remaining three pairs, their young could very easily have been hidden in the tall grass along the lake shore.

At 4:00 a.m. on June 15, 1954, a pair of swans was sighted from a base camp on Bell Lake near the mouth of the Tasnuna River. Their behavior seemed to indicate that they were mating. This pair departed and flew toward the west end of the lake where later in the day I discovered a swan's nest. The nest lay on top of what appeared to be an abandoned muskrat house, which was situated in a willow thicket bordering a shallow, marshy slough. It was constructed primarily of grass and down and had an estimated inside diameter of eighteen inches and a height of about three feet. It contained three large, creamy white eggs, which were partly stained and concealed by down. Care was taken not to disturb the nest. No swans were seen in the vicinity at this time.

On June 17, three swans flew over camp. Two of the birds were very large, while the third was smaller by comparison and thought to be immature. It is believed that these were the same birds seen on several occasions in the vicinity of the nest. Their blaring cries were identical to those heard previously on the Bremner River. On this day the nest was visited again. It still contained three eggs, but an abandoned egg was discovered lying half buried in the mud near the base of the nest. This egg was salvaged for future measurement.

The Tasnuna River area was not visited again until July 28. That day a pair of adult swans with two cygnets were seen from the air on a small lake near the nest. Several hours later the nest was checked from the ground. It contained two unhatched eggs and it was apparent that the nest had been abandoned for some time. The remaining eggs were salvaged.

Bent (U. S. Nat. Mus. Bull. 130, 1925:284, 297) lists measurements for swans' eggs as shown in the following table.

Species	No. eggs	Egg measurements in mm.	
Trumpeter	25	Average	110.0×71.1
		Extremes	119.5×76.0
			115.0×76.5
			101.0×62.8
Whistling	94	Average	106.9×68.2
		Extremes	115.7×68.5
			115.0×73.0
			90.0×58.7
Tasnuna River specimens (= Trumpeter)	3		120.0×77.0
			124.0×77.0
			120.0×77.0

The measurements of the eggs taken from the Tasnuna River exceed the extreme dimensions given for Trumpeter Swans and thus provide basis for identification as Trumpeter eggs.

In 1955, on July 6, four pairs of nesting swans were seen from the air on four separate lakes in the lower Bremner River area. Three of these nests, built on what appeared to be abandoned muskrat houses, were on small marsh lakes. The remaining nest was built on the ground at the far end of a narrow peninsula on a relatively large lake. On July 16, one of these nesting pairs was seen with four cygnets.

On August 8, 17 adults and 4 cygnets were carefully observed from the ground at close range with field glasses. None of these swans possessed the yellow or orange lore. Without exception the head and a portion of the neck showed a slight rusty coloration. Of 13 birds in one flock, 11 were smaller by comparison than a pair of large swans accompanying them. It is believed that the small birds in this flock were immature and unmated. The remaining four adults were paired, one pair having four cygnets. When the flock of 13 was approached, one of the swans uttered a short resonant call and the entire flock proceeded to crowd or group together. When pursued further, all of the swans, with the exception of the two larger birds which were molting, took to the air.

Three additional swans and four cygnets were observed on August 9. A photographic record was obtained of one molting bird at a range of 25 feet. It was an exceedingly large swan with foot prints measuring $7\frac{3}{4}$ inches long. As noted on the preceding day, none of these swans had the yellow lore.

While flying aerial salmon surveys on August 11, in the Tasnuna and Bremner river basins the writer counted a total of 69 adult swans and 15 cygnets. Five pairs had broods comprised of 4, 4, 3, 2, and 2 cygnets. Because of the dense vegetation and their gray coloration, the cygnet count is not considered accurate. Most of the swans were paired with the exception of two distinct flocks, one of 6 and the other of 10 birds.

Most of the swans had departed by September 28, when a limited aerial reconnaissance was made of the area. However, the four pairs of nesting swans observed on July 6 were still at their original small marsh lakes. The cygnets by this date were much larger in size but still possessed their grayish coloration. Since they had not moved from their original nesting locations, it was assumed that at this date the cygnets were unable to fly.—MELVIN A. MONSON, *United States Fish and Wildlife Service, Anchorage, Alaska, May 22, 1956.*