

- King, J G and C J Lensink (1971). *An Evaluation of Alaskan Habitat for Migratory Birds*. US Fish and Wildlife Service. Processed Report. 46 p.
- King, J G (1973). The Use of Small Airplanes to gather Swan Data in Alaska. *Wildfowl* 24: 15-20.
- Lensink, C J (1973). Population Structure and Productivity of Whistling Swans on the Yukon Delta, Alaska. *Wildfowl* 24: 21-25.
- US Department of Interior (1977). *Standard Operating Procedures for Aerial Waterfowl Breeding Ground Population and Habitat Surveys*. US Fish and Wildlife Service. Processed Report. 88p.

J G KING
US Fish and Wildlife Service
Box 1287
Juneau
Alaska 99802
USA

THE STATUS AND FUTURE OF THE ALASKA POPULATION OF *CYGNUS CYGNUS BUCCINATOR*

J G KING

Introduction

The Alaska population of *Cygnus cygnus buccinator* is distributed along the coastal plain from Yakutat to Cook Inlet, in the forested Interior valleys of the Copper and Susitna Rivers and in the Yukon River system east of the tundra and south of the Arctic Circle. Some of the highest mountains of North America occur in this region, including Mount McKinley (6187 m). Extensive ranges of lesser peaks and the largest ice fields of the continent are also features of the area. Interspersed are temperate lowlands interconnected by large river valleys. Most of the 70 000 km² of *C. c. buccinator* habitat is below the 300 m contour. The tree line is generally about 825 m and no swans are seen above this elevation. Because of the low passes interconnecting all areas it is now assumed that the Alaska *C. c. buccinator* is one population. For census purposes the area is divided into eight units (Fig 1). A detailed description of the swan habitat and the historical record is provided by Hansen *et al* 1971.

In 1975 we conducted an intensive aerial search of all the known *C. c. buccinator* habitat except for three tundra areas where there are isolated reports of *C. c. buccinator* within the nesting range of *Cygnus columbianus columbianus*. The results are compared with counts in the previous 20 years and especially the intensive 1968 survey.

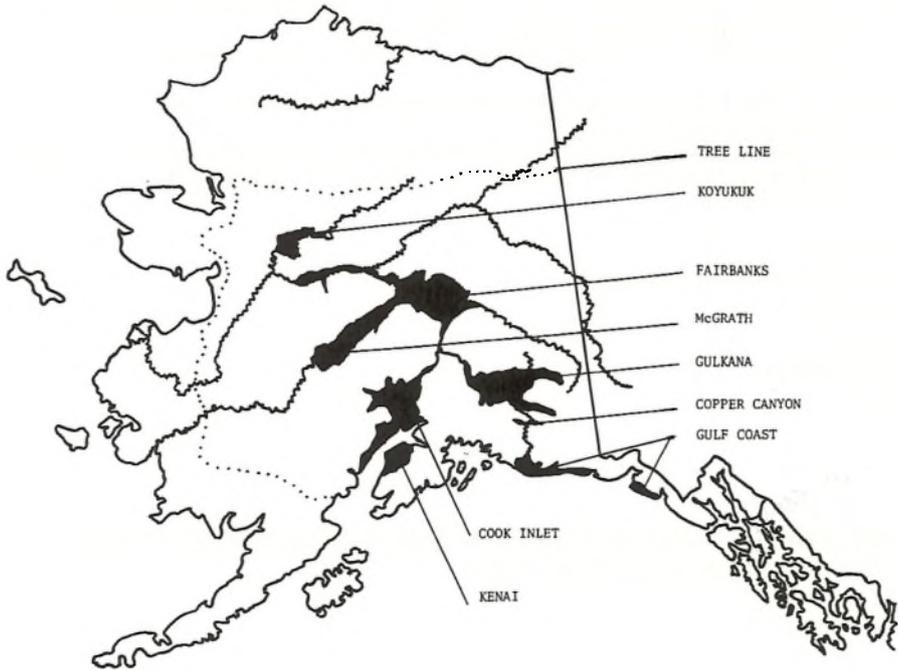


Fig 1. Habitat units of *Cygnus c. buccinator* in Alaska.

Survey method

A Cessna 185 amphibian, a high-wing single-engine four-place aeroplane, was used. USGS maps of a scale 1:63 360 were used to navigate and to record all data precisely. The survey was conducted between 7 August and 15 September, at the time when broods were large enough to be easily seen and before fledging, giving a record of swans on territory. This survey required 186 hours of flight time for a total of some 31 423 km.

Swans were recorded as single birds, pairs, flocks of three or more and a number of young birds in broods. A comparison of birds in pairs that appear to be on territory, whether accompanied by young or not, seems to offer the best indication of population trends. Production seems to have been better in 1968 when 32% of the population were young-of-the-year compared with only 28% in 1975.

Results

The actual counts of *C. c. buccinator* were 2847 in 1968 and 4170 in 1975 for an increase of 46% in observations (Table 1). Paired bird observations increased from

1320 to 2102. A direct comparison is not possible as the 1975 survey included four habitat units not covered in 1968 and required 81% more air miles and covered 64% more habitat. A map by map comparison of areas covered in both years indicates a 24% increase of paired birds since 1968 which works out to a compounded annual increase of 3.1%.

Table 1. Total swans 1968 and 1975 and percent composition

		Single adults		Paired birds		Flocked adults		Young in broods		Totals	
		no.	%	no.	%	no.	%	no.	%	no.	%
Gulf Coast	68	29	3	442	43	191	19	363	35	1025	100
	75	32	4	442	52	190	22	193	23	857	101
Copper Canyon	68	5	3	56	35	53	34	44	28	158	100
	75	2	1	56	31	72	40	49	27	179	99
Gulkana	68	31	5	288	49	81	14	191	32	590	100
	75	43	4	556	54	155	15	284	27	1038	100
Kenai	68	3	2	86	48	27	15	65	36	181	101
	75	5	3	72	50	29	20	39	27	145	100
Cook Inlet	68	19	5	224	54	50	12	124	30	417	101
	75	36	6	340	55	60	10	181	29	617	100
Fairbanks	68	21	4	224	47	94	20	137	29	476	100
	75	21	2	518	47	185	17	388	35	1112	101
McGrath	68	—	—	—	—	—	—	—	—	—	—
	75	6	16	20	54	4	11	7	19	37	100
Koyukuk	68	—	—	—	—	—	—	—	—	—	—
	75	6	3	94	52	45	25	35	19	180	99
Fort Yukon	68	—	—	—	—	—	—	—	—	—	—
	75	0	—	2	67	0	—	1	33	3	100
Haines	68	—	—	—	—	—	—	—	—	—	—
	75	0	—	2	100	0	—	0	—	2	100
Totals	1968	108	4	1320	46	496	17	923	32	2847	99
	1975	151	4	2102	50	740	18	1177	28	4170	100

Gulf Coast There are 504 144 ha of coastal lowland habitat along the Gulf of Alaska coast. The area had 1025 swans in 1968 and 857 in 1975, an apparent decrease; however, birds seen in pairs remained exactly the same at 442. The land is largely in US Forest Service ownership with perhaps 20% in State of Alaska ownership and a smaller portion eligible for native selection as private lands. The habitat is pristine except for an oil-field and mining venture abandoned before World War II, a few fishermen's cabins along the coast and a short road. There is a

potential for oil development both onshore and offshore, for strip coal-mining and for recreational cabins. Helicopters and low-flying light planes involved with prospecting are a daily feature. Several swan territories along the road occupied in 1968 were vacant in 1975 and hearsay information suggests they were shot by vandals.

Copper Canyon There are only 12 701 ha of habitat here. Total swans increased from 158 to 179 but paired birds here, too, remained the same at 56 birds. The habitat is in narrow river bottoms surrounded by high mountains. The land is federal property with proposals for refuge status as well as native ownership pending. The area is pristine except for a railroad right-of-way abandoned in the 1930s. A state project for conversion of the railroad grade to a highway seems a likely possibility.

Gulkana Basin This area contains 1 293 408 ha of habitat in an intermountain basin with swan habitat at elevations from 488 to 823 m. Swan totals increased 76% from 590 to 1038 between the two surveys with a 96% increase of paired birds from 288 to 566. It seems likely that surplus birds from the saturated habitat on the Gulf Coast and Copper Canyon units are moving into this contiguous area. The trans-Alaska pipeline corridor bisects this area as well as several roads. About half the area, including the best habitat, is state land with the other subject to native ownership. There are several hundred recreational cabins on major lakes within the state lands and further cabin building seems likely for this famous hunting and fishing area midway between the population centres of Anchorage and Fairbanks.

Kenai Peninsula The Kenai habitat with 402 278 ha is really part of the Cook Inlet area but as it is entirely within the Kenai National Moose Range it has been censused separately. Total birds dropped from 181 to 145 with a drop from 86 to 72 paired birds. Long-term records indicate this may be a natural fluctuation and the population is relatively static. The Moose Range has an active oil-field and a popular recreational canoe system within the swan habitat. An intensive, largely successful effort has been made to prevent swan disturbance.

Cook Inlet In this coastal valley of 1 399 420 ha total swans increased 48% from 417 to 617. Paired birds increased 52% from 224 to 340 indicating a substantial increase. Virtually all habitat in the area is state and private land. It is the site of Alaska's major population centre, largest agricultural development and has the greatest concentration of float planes in the world. Since 1968, recreational cabins have been built on every lake suitable for float plane landing. Many lakes adjacent to the highway network are ringed with cabins. An active oil-field, power lines, roads, railroads and airfields are features of the region. The future promises more of the same plus the possible relocation of the state capital to a wilderness site and strip mining for coal. There is a pending proposal for protected swan management areas covering some 20 250 ha of the best swan habitat.

Fairbanks There are 1 893 715 ha of habitat in the broad valleys of the Interior. Observed birds increased from 476 to 1112 in this unit with paired birds increasing from 224 to 518 for an increase of 131%. The 1975 survey was more extensive; thus the true increase, though substantial, is less than indicated. The habitat is two thirds in state ownership with native selection and National Interest lands making up the other third. Disturbance by subsistence hunters and the urban Fairbanks population may affect swan numbers. Recreational cabins are increasing. Expansion of agriculture and oil development are possibilities.

McGrath The 646 185 ha of habitat were not surveyed in 1968. Only 37 swans were seen in 1975. Subsistence hunting may be a factor as the best habitat is along the Kuskokwim River near Indian villages in areas destined for native ownership.

Koyukuk The 1 034 208 ha of habitat had a total of 180 swans observed in 1975. This area, too, is a subsistence hunting area destined largely for native selection. A refuge proposal largely misses the best swan habitat.

Other areas There are isolated *C. c. buccinator* breeding records from the Haines area in southeast Alaska, the Stoney River, the Yukon Flats and the Yukon Delta. A possible nesting record from Prince of Wales Island in southeast Alaska was reported in summer 1976. There are three summer observations from the northeast coast of Alaska. Whether these records indicate pioneering by an expanding population or are isolated occurrences in the marginal fringe of habitat is not known at present.

Discussion

It appears that Alaska's *C. c. buccinator* has been increasing steadily for three or more decades. Just why Alaska's relatively pristine habitat should have become depopulated is not clear. Glacial retreat and thermal records from permafrost indicate a warming during the past 100 years. On the Gulf Coast some glaciers have retreated as much as 100 km (Pewe 1975). It seems likely that in the southern half of the *C. c. buccinator* range much or most of the present habitat was ice-covered 100 years ago. A remnant population may have survived in the never glaciated valleys of the Interior. After the gold rushes at the turn of the century trappers were hunting muskrat *Ondatra zibethicus*. Swans in pairs settling into nesting territories were extremely vulnerable to these undisciplined subsistence hunters. The fur boom peaked in the 1930s and has been declining ever since. Likewise, Alaskan swans may have been persecuted by hunters in winter, particularly in the early occupied portion of the lower Columbia River and Puget Sound.

In 1968, the Alaska *C. c. buccinator* was almost entirely on federal lands and the habitat appeared to be relatively safe from encroachment. Since then, the infant oil industry has already more than doubled the human population within the swan

range. Float planes, helicopters, roads, powerlines and pipelines are increasing.

Perhaps the most dramatic change in Alaska, however, has been the yet to be completed change in land ownership. Major portions of the swan habitat have been selected by the state under terms of the Alaska Statehood Act. State lands have been made easily available to those interested in recreational cabin building. Timm and Wojeck (1978) point out there has been a 257% increase in the number of recreation cabins in the Cook Inlet area over the past ten years and that swans fail to return to traditional territories on lakes when the number of actively used cabins exceeds two. The Native Claims Settlement Act of 1971 will convey some 16 million ha of public lands into private native-owned corporations. Most will be in lowlands adjacent to their villages which naturally enough were located in the best wildlife habitats available. Major portions of the best swan habitat will therefore become private lands. Virtually none of the swan habitat is included in new National Park and National Wildlife Refuge proposals pending before Congress.

It seems unlikely that the net result of the changing land status and development in Alaska will result in a complete disaster for *C. c. buccinator*. The 4500-odd individuals are scattered over an enormous area. They utilize some large lakes but also beaver *Castor canadensis* ponds and marshy lakes. Much of the preferred habitat will be unaffected by further development. Experience at Red Rock Lakes and perhaps the Gulf Coast, Copper Canyon and Kenai habitat indicates that populations saturate their nesting areas at rather low densities, thereafter remaining static.

Exclusion from major blocks of habitat means an earlier peak in numbers of this presently expanding population. It seems doubtful that the 3.1% rate of expansion can be sustained and that we will achieve an 8000 bird population by 2000 AD.

At present the US Fish and Wildlife Service is budgeting for a complete *C. c. buccinator* census every fifth year. It is in everyone's best interest to avoid the administrative problems that are the inevitable consequence of allowing the species to decline to the point where they come under the restrictive provisions of the Endangered Species Act. Armed with good information, the public, the native corporations, the State and the Federal Government will wish to co-operate in efforts to perpetuate a healthy population of this noble species.

Summary

An extensive aerial survey of *Cygnus cygnus buccinator* in Alaska in 1975 disclosed a total of 4170 birds. An adjusted comparison with a somewhat less complete survey in 1968 indicates a 24% increase or a compounded annual increase of 3.1%. Changes in land status and economic activity may limit continuing increase.

References

Hansen, H A, P E K Shepard, J G King and W A Troyer (1971). The Trumpeter Swan in Alaska. *The Wildlife Society Inc Wildlife Monograph* No 26.