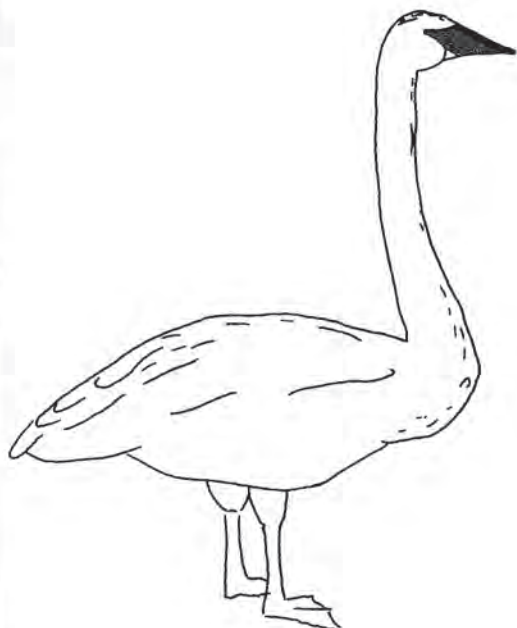


ABSTRACTS OF PAPERS PRESENTED
AT THE 7th TRUMPETER SWAN
SOCIETY CONFERENCE
VICTORIA, BRITISH COLUMBIA
19- 21 FEBRUARY 1981

compiled by

Richard W. McKelvey



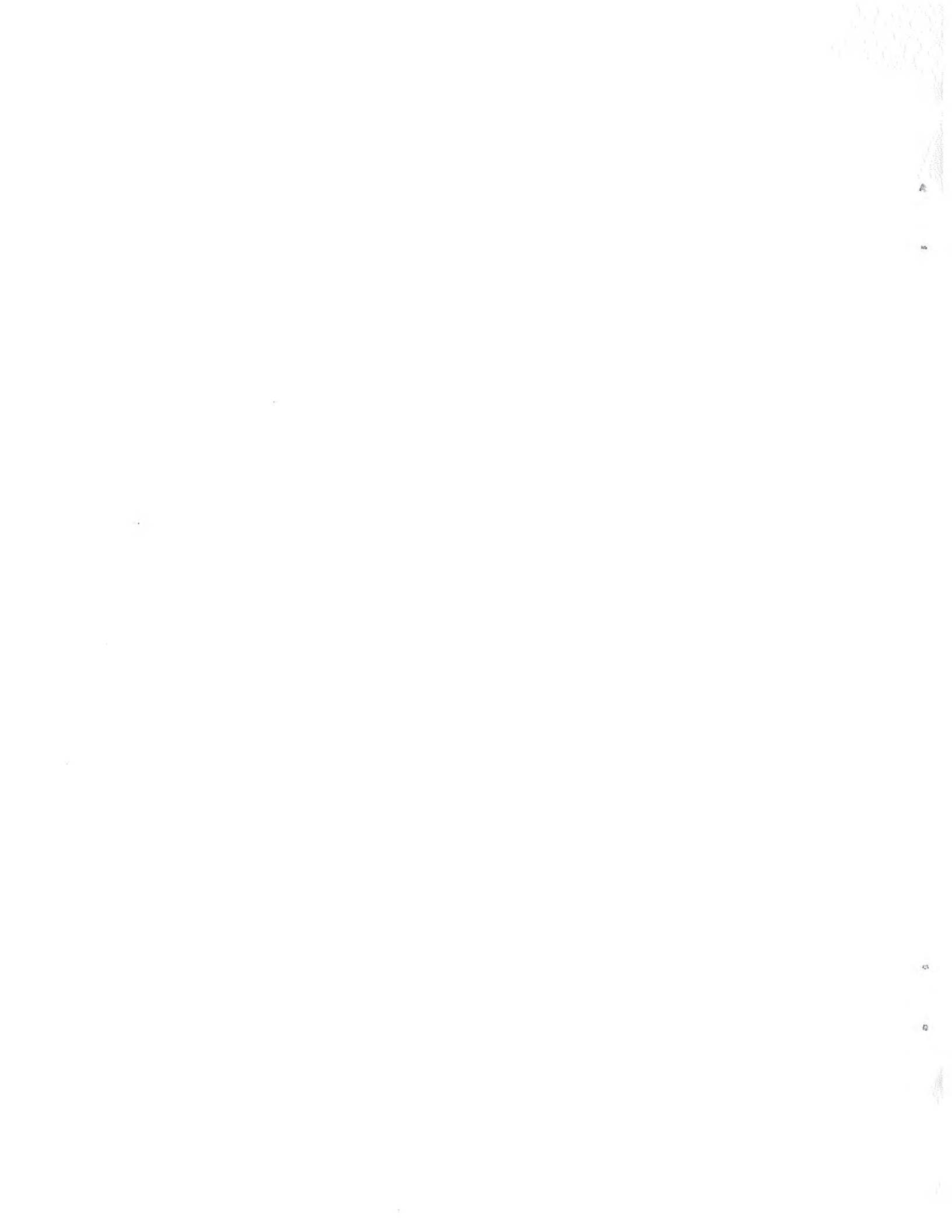
CANADIAN WILDLIFE
SERVICE
Delta, B. C.



Abstracts of Papers Presented at the
7th Trumpeter Swan Society Conference
Victoria, British Columbia.

compiled by
R. W. McKelvey

Department of Environment
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ABSTRACT

McKelvey, R.W. (compiler) 1981. Abstracts of papers presented at the 7th Trumpeter Swan Society Conference, Victoria, British Columbia.

Abstracts and summaries of papers given at the 7th Trumpeter Swan Society Conference are presented. Topics covered include distribution and status reports of wild populations, status reports of refuge flocks, nesting and nesting habitat studies, nesting behaviour, feeding behaviour, parasitology, management plans, reintroductions, the status of Mute Swans on Trumpeter Swan habitat, and general conservation.

RÉSUMÉ

McKelvey, R.W. (compilur) 1981. Résumés des papiers présentés à la 7^e conférence de la Trumpeter Swan Society, Victoria, Colombie Britannique.

Un résumé ou un sommaire de chaque papier présenté à la 7^e conférence de la Trumpeter Swan Society est inclu. Les sujets traités au cours de la conférence incluent: distribution et statut des populations sauvages, statut des troupeaux de cygnes dans les refuges, reproduction et sélection de l'habitat au moment de la reproduction, comportement reproductif, comportement alimentaire, parasites, plans d'aménagement, reintroductions, statut du cygne muet dans l'aire de distribution du cygne trompette, et conservation.

Key Words: Trumpeter Swan, distribution population status, refuges, nesting habitat, parasites, feeding behaviour, food habits, Mute Swans, reintroduction.

ACKNOWLEDGEMENTS

The Seventh Trumpeter Swan Society Conference was co-sponsored by the British Columbia Provincial Museum and the Canadian Wildlife Service. Thanks go to both organizations for financial and manpower assistance. I would like to thank Yorke Edwards for making the Museum facilities available and for welcoming the Trumpeter Swan Society to Victoria, and Wayne Campbell for assisting with the arrangements and running of the meeting. Thanks go also to Clyde Burton and Bud Landis for showing their separate films at the Thursday evening wine and cheese party, and to Hugh Boyd for speaking at the Friday night banquet.

The assistance of Sue Westover at the registration desk, Bob Milne, the projectionist, Marilyn Lambert in helping with field trip arrangements and Rick Davies as a tour guide during the field trip is also greatly appreciated. Dan Wilson invited the field trip party to view Trumpeter Swans on his land at Duncan and Edgar Smith kindly allowed us to visit swans on his farm at Comox and took us on a tour of the dairy.

I would like to thank all the participants, session chairpeople and Conference attendees for their efforts in making the meeting successful and for the many stimulating discussions that resulted. Special thanks to Dave Weaver for his assistance prior to and during the Conference, and on the field trip.

INTRODUCTION

The Trumpeter Swan Society meets at biennial Conferences which consist of paper sessions, general discussions, field trips and Society business. The Seventh Conference was held at the British Columbia Provincial Museum, 19-21 February, 1981 in Victoria. It was co-sponsored by the Canadian Wildlife Service and the British Columbia Provincial Museum.

The papers presented at the 7th Conference were to have been published in a volume as the proceedings of that meeting. However, some contributors requested their papers not be published if United States copyright laws would then prevent later publication in American journals of data presented at the Conference. A compromise, of abstracts only, was settled upon, so that at least the existence of those studies of Trumpeter Swans would become known. This report contains those abstracts and the addresses of the contributors.

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THE 1980 CENSUS OF TRUMPETER SWANS ON ALASKAN NESTING HABITATS

James G. King and Bruce Conant
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A census (complete count) of Trumpeter Swans (*Olor buccinator*) on their Alaskan nesting range in 1980 disclosed 7,696 birds. This is up from 4,170 swans counted in a similar census in 1975 and 2,847 tallied in a slightly abbreviated count in 1968. The data is insufficient to predict how long the population can continue to increase but some tentative conclusions are made.

THE TRUMPETER SWAN ON ARMY LANDS IN ALASKA

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Surveys of Trumpeter Swans breeding on Fort Wainwright Army Post, and immediately adjacent lands in the Tannana Flats area of interior Alaska, were conducted during the summers of 1978, 1979, and 1980 by the U.S. Army in cooperation with the International Waterfowl Research Bureau under the guidance of Dr. William Sladen. The number of birds sighted increased from 70 in 1978 to 110 in 1979, and 174 in 1980, indicating an expanding population.

In addition to the surveys, 7 swans were banded in 1979 and 22 were banded in 1980. Prior to the 1979 survey/banding operations, information concerning this Interior Alaska Trumpeter Swan population was virtually non-existent. Swan sightings in 1980 and 1981 reported by the Canadian Wildlife Service indicate that Vancouver Island is the wintering grounds for some, and maybe all of the Fort Wainwright Trumpeter Swans.

STATUS OF THE GRANDE PRAIRIE TRUMPETER SWAN
POPULATION AND ITS HABITAT

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Long-term data showed that the Grande Prairie Trumpeter Swan population has grown considerably in recent years. Though breeding habitat is limited and could become regulatory in the future, the population did not show any consistent symptoms of breeding habitat limitation at present. Trumpeter Swans prefer to nest on lakes located in the forested zone of the breeding ground. All prime agricultural lands within the breeding area have already been cultivated. Consequently, future land clearing is expected to proceed slowly. Computer simulations demonstrated that the Grande Prairie flock could be used as a source for transplants.

TRI-STATE TRUMPETER SWAN POPULATION PROGRESS REPORT

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The Trumpeter Swan (Olor buccinator) population in the Tri State area continues to remain relatively static as indicated by the 1980 survey results. The 1979 production on the Red Rock Lakes NWR was excellent with 54 cygnets being fledged. In contrast, the 1980 refuge production was extremely poor due to flooding of many traditional nest sites. Over the past three years 58 trumpeters have been fitted with plastic neck collars. In 1980, 49 percent of those birds were sighted, with all observations being made in the Tri State area. The supplemental winter feeding program at the refuge is presently being modified to include a commercial pelletized poultry ration which will provide the swans with a more nutritionally balanced winter food source.

HISTORY AND STATUS OF THE TRUMPETER SWAN ON
MALHEUR NATIONAL WILDLIFE REFUGE, OREGON

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Prior to 1939, only two records of Trumpeter Swans (*Olor buccinator*) were known from Malheur National Wildlife Refuge. Attempts to establish a breeding population at Malheur NWR, with transplants from Red Rock Lakes NWR began in 1939. A number of unsuccessful attempts were made before the first brood of swans was produced in 1958. From 1958 through 1980, 239 cygnets have been fledged at Malheur NWR. The mean annual production has been 10.4, with the 33 cygnets produced in 1979 being the highest on record. Most of the Trumpeter Swans nest in the Blitzen Valley, but swans also nest on Malheur Lake, the Double-O Ranch, private land near Buchanan, Oregon and the Island Ranch at Malheur NWR. Adults are paired on traditional nesting territories by early to mid-March. The earliest known date of incubation was 14 April and the latest has been 7 August. Peak of egg laying and initiation of incubation occur during the first two weeks of May. The earliest brood was observed on 18 May with most broods appearing between 10 June and 25 June. Despite the annual production of more than 10 cygnets and an apparent excess of nesting habitat the breeding population appears stationary. Circumstantial evidence suggests that some young swans are leaving the area prior to sexual maturity. A project was initiated in 1980 to fit cygnets with coded neck collars.

TRUMPETER SWAN TRI-STATE WINTERING HABITAT

Paul D. Hampton
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University of Montana, Missoula, Montana

An update on the carrying capacity of the Trumpeter Swan wintering habitat at Harriman State Park is presented. It was found that the macrophytes which are used by wintering swans have changed dramatically in terms of relative frequency. Yet, the resources which are present are sufficient to provide habitat for five times the number of swans which are currently using the Henrys Fork River within Harriman State Park.

REPORT ON THE STATUS OF THE LACREEK TRUMPETER SWAN FLOCK AND MANAGEMENT PLAN

Rolf H. Kraft, Refuge Manager
Lacreek National Wildlife Refuge
Martin, South Dakota 57551

A total of 196 Trumpeter Swans returned to Lacreek National Wildlife Refuge following the 1980 breeding season. Total production for the Lacreek population to flight stage was 56 cygnets. Winter habitat at Lacreek is being saturated. Plans are being developed to transplant family units to suitable winter habitat at Mingo National Wildlife Refuge, Puxico, Missouri.

TRUMPETER SWANS BREEDING IN
THE SOUTHERN YUKON

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Since 1970 efforts have been made to record summer observations of swans of the southern Yukon. With the accumulation of those records and the identification of many as Trumpeter Swans (Cygnus c. buccinator) extensive aerial surveys were conducted from 1978 to 1980. The result has been the discovery of a new population of Trumpeter Swans breeding in the southern Yukon. All summer records of swans that we are aware of are presented to document that discovery. We believe the Yukon population to number at least 50 pairs.

TRUMPETER SWANS WINTERING IN THE CENTRAL INTERIOR OF BRITISH COLUMBIA

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Fish and Wildlife Branch
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In the past decade about 400 (250-500) Trumpeter Swans have wintered in the Central Interior of British Columbia. The prime sites used are the Stuart, Middle, Tachie, Nautley and Crooked Rivers. Except for the Crooked River the prime sites are all rivers discharging from large lakes and which normally do not freeze. Sections of the Crooked River are kept open by warm springs. Mean temperature in January is about -13°C . Several secondary sites are used in early and late winter and through warm winters. The swans feed on aquatic insect larva in addition to vegetative matter although the importance of each is unknown. Death due to starvation appears to be the main source of mortality. In winters with severe cold the losses can be very high. Over the past two decades cygnets have averaged 29.9 percent of the total swans present. Already industrial developments have had some effect on the swans. To prevent additional impacts much more information is needed about the habitat, the swans' requirements and other factors affecting their survival.

HABITAT MANAGEMENT FOR THE TRUMPETER
SWAN IN ALBERTA:
EXISTING AND PROPOSED

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During the past four years, the Alberta Fish and Wildlife Division has developed a series of land use guidelines to control surface activities on or near lakes used by Trumpeter Swans. Those guidelines are reflected in Conditions of Operation for activities as diverse as oil and gas development to subdivision development. The guidelines are outlined and a six step habitat management plan is proposed.

PROGRESS REPORT ON A TRUMPETER SWAN
NESTING HABITAT STUDY IN IDAHO-WYOMING

Mary E. Maj
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Analysis of Trumpeter Swan (Olor buccinator) nesting habitat on the Targhee National Forest, Idaho-Wyoming was initiated in June 1980 and will continue through September 1981. A total of 12 lakes were selected on the basis of historical use, present use and geographic proximity to lakes used by nesting Trumpeter Swans. Collection of data on aquatic invertebrates and macrophytes, lake morphology and water chemistry were made on each lake. Analysis of that data indicates the only significant differences found between the three lake categories were with alkalinity, total vegetation cover for the month of August, water depths and total surface vegetation. Morphometric measurements of the lakes and aquatic invertebrate data are not presented at this time.

HISTORICAL AND DEMOGRAPHIC ANALYSIS OF
A TRUMPETER SWAN INTRODUCTION ON
TURNBULL NATIONAL WILDLIFE REFUGE

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Trumpeter swans (*Olor buccinator*) were transplanted to Turnbull NWR from Red Rocks Lakes NWR in 1963, 1965 and 1966. The swans spread out from the release pool and nested successfully on the refuge and in surrounding wetlands. Swans wintered on the release pool which was kept ice free by aeration. After the aerator was removed in 1976 the swans began wintering in northern Oregon. Known mortality was primarily due to illegal shooting and flying into powerlines, but many adult swans simply disappeared. Nesting peaked at eight nests in 1970 when all introduced swans first reached breeding age, but the average number of nests was three. The total size of the spring population remained consistently at about 30 until the aerator was removed and the population fell to about 5 at present. Several possible explanations are discussed concerning the failure of the population to expand but no definite conclusions are possible from the existing data. An age class analysis indicated losses in the adult breeding age cohorts were greater than expected. It was considered unlikely that introducing additional swans into the population would allow it to stabilize.

NESTING BEHAVIOR OF TRI-STATE TRUMPETER SWANS

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A multiple sensor system involving the use of infrared photo-electric relays, thermistors, and time lapse photography was used to monitor the nesting activities of Trumpeter Swans (Olor buccinator). The system collected data on nest temperature, nest attentiveness, and behavior during recesses, without disturbing the nesting birds.

FOODS AND FEEDING BEHAVIOUR OF TRUMPETER SWANS WINTERING AT COMOX, BRITISH COLUMBIA

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The predominant food items, determined visually, were rhizomes of Scirpus americanus at Comox Harbour. Microscopic analysis of scats at Comox Harbour for food preferences revealed fronds of Zostera marina to be the most important food item (frequency of occurrence = 33.8%) followed by Scirpus spp. rhizomes (30.8%), pasture grasses (18.5%) and Carex spp. rhizomes (13.8%).

Of eight categories of behaviour studied at Comox Harbour, feeding was the dominant activity in daylight periods (37.7% of the time), while sleeping predominated during the night (41.5%) and over the total 24h period (36.0%). Feeding on dairy pastures occurred during daylight and accounted for 74.6% of the time spent there. All types of behaviour were found to be reducible to two basic types: feeding and resting. On average 57.6% of a given daylight period and 47.2% of a night period was spent feeding on the estuary, while 86.1% of the time on dairy pastures was spent feeding. Feeding on the estuary was regulated by tidal conditions which in turn caused both diurnal and nocturnal feeding. No other environmental factor was seen to be important in regulating feeding behaviour, except perhaps temperature. There was a slight negative correlation ($r = -.53$) between the number of swans feeding at night and temperature. When grazing on dairy pastures, feeding was more or less constant, with no daily peaks of intensity.

BLOOD PARASITES OF TRUMPETER SWANS FROM ALBERTA

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A total of 75 Trumpeter Swans (Olor buccinator (Richardson)) from the Grande Prairie region of Alberta were examined for hematozoa. Haemoproteus nettionis was found in 26 (34.6%) swans. Leucocytozoon simondi occurred in one swan and Plasmodium circumflexum was seen in two swans. Local, second year and adult female swans had similar rates of hematozoan infection; the second year and after-hatching year male swans had substantially higher infection rates than other subgroups.

POSSIBLE EFFECTS OF HUMAN ACTIVITY ON THE
USE OF LAKES BY TRUMPETER SWANS

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Data on Trumpeter Swans (Olor buccinator) breeding in the Grande Prairie region of Alberta from 1970 to 1979 were analysed to determine if human activity near lakes influenced the swans' use of the lakes. Brood sizes and pre fledging survival of cygnets were also estimated from the survey data and compared for two categories of lakes with differing exposure to human activities. Results suggest that human activity near small lakes may inhibit breeding pair use of those lakes. No consistent relationships could be established between brood size or cygnet survival and human activities.

FORAGING ECOLOGY OF A WINTERING TRUMPETER
SWAN POPULATION IN SOUTHEAST ALASKA

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In the fall of 1980 the vegetation in a Trumpeter Swan wintering area near Petersburg, Alaska was identified and quantified. Over the winter of 1980-81, the foraging use of this vegetation by adult and juvenile swans was recorded.

Three major vegetation zones were identified: the saltwater mudflat, brackish water aquatic, and sedge border zones. Eel grass (Zostera marina) was the only aquatic tracheophyte in the saltwater mudflat zone. The brackish water aquatic zone contained mainly ditch grass (Ruppia spiralis) and the sedge border zone was composed of primarily Carex sp., Deschampsia cespitosa, Potentilla egedii, and Agrostis tenuis. The foraging use of those zones was: 9 percent in eel grass areas, 76 percent in ditch grass areas, 14 percent in sedge areas and 1 percent in other vegetation areas. The roots of the ditch grass, sedge and eel grass were found to be the major food sources of the wintering swans. Ditch grass roots were preferred over the other food items except when ice cover or tide level decreased their availability. With extensive ice cover the swans shifted foraging efforts to eelgrass areas. At high tide levels foraging effort was shifted to the flooded sedge areas.

Differences between adult and juvenile swan foraging locations along the estuary indicated family group segregation and possibly territoriality on the wintering area. It was felt that the dynamic foraging behavior of the swans in using the three major food sources, depending upon their availability, was the main factor in allowing Trumpeter Swans to winter in this northern area.

THE BEHAVIORAL-ECOLOGY OF SWANS
WINTERING IN SOUTHEAST ALASKA

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A group of 73 Trumpeter Swans (Olor buccinator) and 6 Whistling Swans (Olor columbianus) were observed during the winter of 1979-80 near Petersburg, Alaska. Out of the total of 79 swans, there were 60 adults and 19 cygnets, comprising 7 family groups. The time-activity budget revealed that over 54 percent of the daylight hours were spent in foraging, 21 percent in sleeping, 12.7 in moving, 6.6 in maintenance, 4.8 in resting and 0.6 in flight. The high proportion of time spent foraging seemed to indicate that their wintering habitat was marginal in terms of the food resources.

The extent and type of use by the swans of different locations within the study area was found to vary considerably depending largely on ice cover and the presence of food. The availability of food was the predominate factor that influenced both the swans location and the proportion of time they spent engaged in foraging and resting activities. Access to food was directly determined by ice cover and tidal activity. Temperature appeared to be important only in an indirect sense through its relationship with ice cover. Time of day as well as weather conditions (precipitation and degree of cloud cover) had no significant influence on the amount of time spent in foraging and resting activities. The primary food source was submerged aquatic vegetation in the family Potamogetonaceae.

THE PACIFIC FLYWAY TRUMPETER SWAN MANAGEMENT PLAN

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An overview of the proposed Management Plan for Pacific Flyway Trumpeter Swans is presented. The plan discusses two subpopulations of Trumpeter Swans: the Pacific Coast Trumpeter Swans, which breed generally in Alaska and winter along the west coast of North America; and the Mid-Continent Trumpeter Swans, which breed in northern Alberta and other parts of the Canadian prairies, and winter and breed in the tri-state area of Idaho, Montana and Wyoming.

General aims of the plan are to maintain populations at or above current levels and to ensure that adequate habitat is available. Other topics discussed include status, problems and management procedures on a regional basis throughout the Pacific Flyway.

SWAN HABITAT PRESERVATION EFFORTS AT BARNEY LAKE, WASHINGTON

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and
John Munn
Washington State University
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Barney Lake and much of the Nookachamps Creek wetlands are the winter home to a growing population of Trumpeter Swans. The population has increased from 6 in 1957 to 436 in February 1981. The human population in the area has also grown considerably in the same interval. That has resulted in increased development pressures on lowland areas and a lowered quality of water in Barney Lake. Many citizens of the Barney Lake area are concerned for the future of the Trumpeter Swans winter habitat. An association has been formed called Friends of the Swans to promote cooperation between government departments, citizens and conservation groups. Their aim is to establish a marshland sanctuary that will preserve this important piece of Trumpeter Swan habitat.

HISTORICAL AND PRESENT TRENDS IN ABUNDANCE
AND DISTRIBUTION OF FERAL MUTE SWANS
ON VANCOUVER ISLAND, BRITISH COLUMBIA

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A small number of Mute Swans were introduced at Victoria, British Columbia during the late 1800's and again in the 1930's. The population level remained relatively static at 15 to 30 swans until the late 1960's and distribution was restricted to the Victoria area. Since 1969 the swans have expanded their range up the east coast of Vancouver Island to Duncan, 80 km north of Victoria. Population levels in Duncan have risen rapidly from 2 swans in 1969 to 110 in 1980. Free-flying Mute Swans have been observed at other Vancouver Island localities but resident populations have not been observed. Wildlife agencies and groups are concerned that any further increase in Mute Swan numbers or distribution could harm the substantial population of Trumpeter Swans wintering each year on Vancouver Island.

A BRIEF NOTE ON NATIVE SWANS WINTERING ON
VANCOUVER ISLAND, BRITISH COLUMBIA, FEBRUARY 1981

Rick G. Davies
Ministry of Environment
Nanaimo, British Columbia

Aerial counts indicated a minimum number of 1685 native swans wintering on Vancouver Island in February 1981. The majority of the swans were thought to be Trumpeter Swans. This total represents a 78% increase from the total observed during the January/February surveys of 1976 and is slightly higher than the 60-70% increase observed on the Alaska breeding ground by the U. S. Fish and Wildlife Service between 1975 and 1980.

THE PSYCHOLOGICAL SUPERIORITY OF HAND-REARED
TRUMPETER SWANS FOR RESTORATION
IN URBANIZING ENVIRONMENTS

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Trumpeter swans must co-exist with man if they are to be restored to their former range. Care must be taken to prevent swans from developing a fear of man if they are to be used for restoration. Unfortunately, most restoration efforts require capturing swans at some point. Capture, for any reason, constitutes one of the most disruptive interactions between man and swans, and will permanently affect a swan's ability to adapt to man. A way must be found to minimize this disruption if restoration attempts are to be successful. Rearing cygnets by hand is proposed as a solution. Hand-reared birds withstood the rigors associated with capture and captive propagation better than swans reared by adults, either in the wild or in captivity. They accept people much more readily at all stages of their lives. Examples are given. The author suggests that hand-reared swans be used for restoration programs whenever frequent contact with people is expected.

A COASTAL WATERFOWL AND HABITAT
INVENTORY FOR BRITISH COLUMBIA AND ITS
RELATIONSHIP TO TRUMPETER SWANS.

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In 1979 the Terrestrial Studies Branch, in conjunction with the British Columbia Fish and Wildlife Branch and Ducks Unlimited (Canada) initiated a program to inventory waterfowl and waterfowl habitat along the 27,000 km of British Columbia's coast. Waterfowl inventory included fall, winter and spring aerial survey coverage of as large a portion of the coast as possible. During winter surveys many inland lakes adjacent to the coast were also surveyed in order to detect as many swans as possible. Swans were classified by age (cygnet vs. adult) and an attempt was made to identify birds to species. In order to facilitate data storage the coastal zone was divided into 92 Regions, which were further subdivided into Sub Regions and subsequently Areas (small homogenous units). Large scale (1:5,000 - 1:10,000) estuarine habitat inventory and mapping is being conducted beginning with estuaries of high priority from an enhancement and habitat protection perspective. Interpretations regarding waterfowl and swan capability of coastal sites will be developed on the basis of existing literature and habitat use surveys currently being conducted.

TRUMPETER SWANS IN SKAGIT VALLEY, WASHINGTON:
AN OVERVIEW

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The Skagit Valley, Washington, supports the largest wintering population of Trumpeter Swans south of the Canadian border. The population, which has increased from six in 1957 to over 400 in 1980, has attracted the attention of amateur and professional ornithologists. This paper presents the results of observations from 1977 to 1980 in the Skagit Valley by private citizens. Six principal areas of swan use are identified around Barney Lake, an old oxbow of the Nookachamps River. Pasture vegetation was a principal food source, while open water of adjacent lakes was used for loafing. Swans neck collared in Alaska were observed on several occasions. Of note was a swan banded in 1972 as 09VY and rebanded as 00VT in 1980. It has been seen several times since 1972, including 1980. Swan arrival and departure dates have been consistent from year to year: swans arrive in late October and depart by late March. The peak population is present in January and February. The swans use habitat close to an urban area; habitat loss from urban expansion is an ever present threat.

