SCOTTIE CREEK BIBLIOGRAPHY REFERENCE

Name	Author	Year	Reference	Report Name
Scottie Creek	McKennan, Robert A.	1959		The Upper Tanana Indians, Dept of Anthropology Yale University pp. 30
	Kessel, B., Murphy, S., & Vining, L.	1980		Waterbirds and Wetlands. Chisana-Upper Tanana Rivers, Alaska, 1979 (With emphasis on the Scottie-Desper Creek Wetlands)
	Spindler, M.A. & Kessel, B.	1977		Wetland Bird Populations in the Upper Tanana Valley, Alaska 1977
	State of Alaska by Sterling, Dale A.	1982		Contemporary Uses of Lakes in the Northway Region of Alaska
	Valdez, Richard A.	1976		Fisheries Survey of Tanana River Tributaries along the Alcan Gas Pipeline Route, TR-21

FINAL REPORT

WATERBIRDS AND WETLANDS

CHISANA-UPPER TANANA RIVERS, ALASKA, 1979

(WITH EMPHASIS ON THE SCOTTIE-DESPER CREEK WETLANDS)

Prepared for and Funded by

Northwest Alaskan Pipeline Company

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able 1. Field Schedule for 1979 studies of waterbirds and wetlands, upper Tanana River Valley, Alaska.

Date	Activity
6 April - 17 May	Monitored spring migration and breakup between Delta Junction and U. S.-Canada border. Conducted aerial surveys on 20, 24, 28 April and 2, 6, 14 May.
8 May - 23 May	Censused waterbirds in Stratum 1
4 May - 31 May	Censused waterbirds in Stratum 3
June - 13 June	Censused waterbirds in Stratum 1
4 June - 18 June	Censused waterbirds in Stratum 3
9 June - 4 July	Pond mapping, bathymetry, limnology, and invertebrate sampling
2 July - 15 July	Censused waterbirds between Willow Lake and Gardiner Creek
9 July - 23 July	Censused waterbirds in Stratum 1
4 July - 28 July	Censused waterbirds in Stratum 3
9 July - 31 July	Sampled invertebrates (incomplete)
August - 4 August	Censused waterbirds in Stratum 2
0 August - 12 August	Surveyed Chisana River and Gardiner Creek
20 August - 25 August	Censused waterbirds in Stratum 1
26 August - 28 August	Censused waterbirds in Stratum 3
29 August - 11 September	Sampled invertebrates and limnology
17 September - 19 September	Censused waterbirds in Stratum 1
20 September - 25 September	Censused waterbirds in Stratum 3
26 September - 12 October	Monitored fall migration and freezeup in the Scottie-Desper Creek wetlands. Conducted an aerial survey on 8 October.

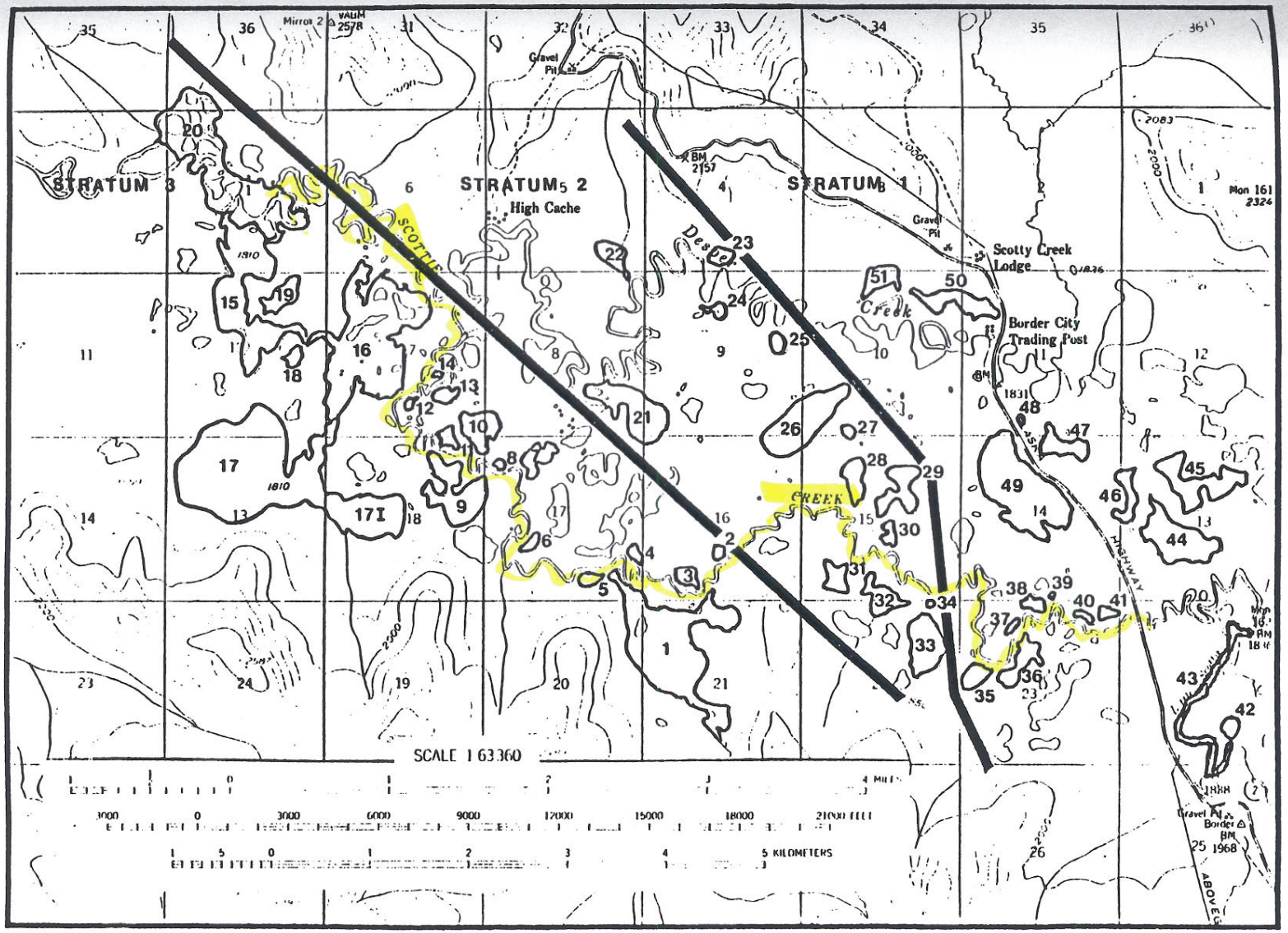

Figure 4. Map of Scottie-Desper Creek study area, 1979, showing waterbody identification numbers and geographic strata boundaries.

Fluviatile (Riverine) Waters

The creeks on the study area were divisible into two types. Little Scottie Creek and Desper Creek were shallow, low-volume creeks that supported submergent vegetation in their channels and wet meadow vegetation along their gently-sloping banks; Desper Creek freezes almost solid in winter (Chihuly et al. 1979), and Little Scottie Creek probably does, too. Scottie Creek was a relatively deep-channeled, high-volume creek with steep banks and few aquatic plants. The banks were leveed and forested, and the creek apparently carries running water throughout the winter (Chihuly et al. 1979).

Wet Meadow

Wet meadows constituted less than 5% of the study area. This habitat occurred primarily around the perimeters of lacustrine waterbodies and, in localized areas, along the banks of creeks. Meadows dominated by Carex rostrata or C. aquatilis were the most common. Often, to the landward, these sedge meadows graded into a narrow band of bluejoint grass meadow (Calamagrostis canadensis). Common forbs found in localized areas, especially in thin bands along poorly developed shorelines, were buckbean (Menyanthes trifoliata), marsh marigold (Caltha palustris), wild calla (Calla palustris), and marsh fleabane (Senecio congestus). A small percentage of the wet meadow habitat was bog. Several isolated ponds were forming quaking bogs that supported sedges, spike rushes (Eleocharis spp.), and forbs.

Tall Shrub Thicket

All the tall shrubs (2.5–4.9 m high) on the study area were willows (Salix spp.), although mountain alder (Alnus crispa) occurred in the surrounding foothills. Most of the tall shrub habitat occurred around the perimeters of the lacustrine waterbodies, landward of the wet meadow zone. Tall shrubs were more prevalent in the western portions of the study area than elsewhere.

Low-Medium Shrub Thicket

Low-medium shrubs (0.4–2.4 m high) covered much of the study area. The dominant shrubs were leather leaf (Chamaedaphne caliculata), blueberry (Vaccinium uliginosum), and Labrador tea (Ledum palustre). Other common shrubs included dwarf birch (Betula nana) and sweet gale (Myrica gale). Large areas of low-medium shrub habitat occurred in association with tussock sedges, and almost equally common were associations with Sphagnum moss. Both situations were bogs, with moisture-saturated organic soils. In an east-west transition, the low-medium shrub bogs began to include occasional trees of spindly paper birch (Betula papyrifera) and black spruce (Picea mariana) in the center of the study area, and farther westward these trees became dense enough to form an open deciduous forest bog--a classical example of a continuum of intergrading plant communities along a moisture gradient.

Coniferous Forest

Both white spruce (Picea glauca) and black spruce forests occurred on the study area. White spruce was restricted to the well-drained areas of topographic relief on the valley floor and in the surrounding

foothills. Black spruce, which can tolerate a damper substrate, occurred sporadically throughout the area. The major concentration of pure stands of black spruce was along Desper Creek. Black spruce bogs were frequent.

Deciduous Forests

Deciduous forests occurred primarily on the western portions of the study area, where drainage appeared to be better than farther east. Paper birch was the dominant deciduous tree on the valley floor, whereas aspen (Populus tremuloides) occurred in pure stands only on the steep slopes of the foothills. Several individual trees of balsam poplar (P. balsamifera) were also present on the study area.

Mixed Deciduous-Coniferous Forest

Mixed forests, in which neither deciduous nor coniferous tree species comprised 90% or more of the canopy, occurred along Scottie Creek and throughout the surrounding foothills. White spruce and paper birch formed the mixed forest on the levees of Scottie Creek, whereas white spruce and aspen formed the mixed forest in the foothills.

Scattered Woodland and Dwarf Forest

One area across Desper Creek from High Cache appeared, from a distance, to be scattered black spruce woodland.

Artificial Habitats

The artificial habitats in this area consisted of the buildings along the Alaska Highway and the extensive gravel pit workings near the Alaska-Canada border.

METHODS

Aerial Surveys

Seven aerial surveys, totaling 25 hr of flight time, were flown during spring and fall migration (see Table 2 for dates). Surveys were conducted from a single-engined, fixed-winged aircraft flown between 75 and 150 m (250-500 ft) above ground level. Only one pass per survey was made over an area. Data obtained on these surveys included 1) location and availability (snow-ice conditions) of waterbird use areas, 2) numbers of waterbirds per use area, and 3) species composition of each use area. Supplemental observations for habitat mapping of the Scottie-Desper Creek study area were made on the fall survey flight.

Ground Censuses

Systematic censuses of waterbirds were conducted monthly, from May through September, on the Scottie-Desper Creek study area. Additionally, one census was conducted from 12 to 27 July 1979 of 13 of the more heavily used waterbodies along the proposed Northwest Alaskan Gas Pipeline route between Tetlin Junction and the Alaska-Canada border for data comparison with the 1977 census (Spindler and Kessel 1977).

On the Scottie-Desper Creek study area, 37 waterbodies, totaling 5.5 km^2 (2.1 mi^2), were selected for the monthly censuses. They were selected on several bases: to include 1) waterbodies censused in 1977 (Spindler and Kessel 1977), 2) a broad representation of the waterbody types of the area, 3) ponds at different distances from the Alaska

Table 2. Dates and coverage of aerial surveys, upper Tanana River Valley, Alaska, 1979.

Date	Area
20 April	Tanacross to Delta Junction
24 April	Delta Junction to Alaska-Canada border
28 April	Delta Junction to Alaska-Canada border
2 May	Dry Creek to Alaska-Canada border
6 May	Tetlin Junction to Alaska-Canada border
14 May	Northway to Alaska-Canada border
8 October	Northway to Alaska-Canada border

Highway, and 4) ponds of reasonable accessibility. These 37 waterbodies, which were located in Stratum 1 and Stratum 3 (see below), comprised the maximum that could be censused every month. During the July census period, however, 14 additional, less accessible waterbodies in Stratum 2, totaling 0.9 km^2, were censused, providing 58% coverage (6.4 km^2) of the wetlands of the study area for that mid-summer period.

Each waterbody that was censused was assigned an SDC (Scottie-Desper Creek) number; numbers assigned in 1977 by Spindler and Kessel (1977) were retained. "Grace Lake" of Spindler and Kessel (op. cit.) is SDC 49 in this report; Little Scottie Creek is SDC 43.

Our choice of reasonably accessible waterbodies contributed some bias to our results. Accessibility, in large part, was a function of the nearness of a waterbody to the creek system, our major avenue of transportation; and our studies later showed that waterbodies hydrologically connected to the creek system received heavier use by waterbirds, especially ducks. Thus, waterbird densities derived from the monthly censuses are probably higher than densities of waterbirds over the entire wetlands of the study area. We estimate that while our five monthly censuses covered only 50% of the wetland habitat, we counted between 75% and 90% of all the waterbirds on the study area.

Census techniques, using waterbodies as the primary sampling units, were the same as those used by Spindler and Kessel (1977): Small ponds and marshes were censused by two people walking in opposite directions around the perimeter. All birds seen when the crew first

arrived were recorded to prevent double-counting later, and all birds seen or flushed from the water or surrounding wetlands during the walk around the shoreline were counted. Birds flying over the wetlands were not counted unless they were foraging over (e.g., terns) or land on the site. Large lakes and fluviatile waters were censused by two observers in a canoe (without motor). Midway Lake was so large (6 km^2), we subdivided it into sections, which were censused sequentially.

Total numbers of waterbirds and species composition were determined on each census; sex, age, and activity of individuals were recorded whenever possible. Density figures used in this report are based on square kilometers of wetland habitat (see definition, p. 11), unless otherwise indicated.

Seasonal Chronologies and Waterbird Production Data

Data on seasonal chronologies were obtained through continual observation during the field season. For chronologies of various events of the breeding cycle, it was often possible to approximate dates of egg-laying and hatching by back-dating from aged eggs or young through the use of information derived from the literature (average clutch size, incubation period, fledgling period.)

During the nesting season, as part of the censusing effort, waterbodies and adjacent wet meadows were searched for signs of breeding birds. When nests were found, they were inconspicuously marked for subsequent monitoring. Eggs were counted and then floated to determine the stage of incubation (Westerkov 1950).

WETLAND BIRD POPULATIONS IN THE UPPER TANANA RIVER VALLEY, ALASKA, 1977

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WETLAND BIRD POPULATIONS IN THE UPPER TAN[illegible] RIVER VALLEY, ALASKA, 1977

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For a distance of 75 miles in the upper Tanana River Valley, the proposed Northwest Alaskan Gas Pipeline route adjoins one of Alaska's major waterfowl breeding and molting areas, here referred to as the Tetlin-Northway Wetlands. Waterfowl utilization of portions of these wetlands make them equal in productivity to the best wetland areas of Alaska, including Minto lakes and the most productive strata of the Yukon Flats (J. G. King, Supervisor of Waterfowl Investigations, Alaska, U.S. Fish and Wildlife Service, pers. comm.). The U.S. Fish and Wildlife Service sponsored ground and aerial waterfowl studies in the region during the late 1950's and early 1960's, primarily in the Tetlin lakes area (McKnight 1962, Hansen 1960, Hansen and McKnight 1964, Schneider 1965). James G. King, U.S. Fish and Wildlife Service, has continued to fly annual transects between Tetlin Lake and Northway, and, until 1977, he made annual ground brood counts in the Tetlin lakes area (annual November issue of Pacific Waterfowl Flyway Report). Little, however, has been known about the bird utilization of the Tetlin-Northway Wetlands outside of these areas.

In 1977, a survey of wetland[1] birds was undertaken along the proposed gas pipeline route[2] between Tetlin Junction and Little Scottie

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[1]The term "wetland bird" is used in this report to refer to water-affiliated non-passerine birds: loons, grebes, waterfowl, cranes, shorebirds, and raptors which use the wetlands.

[2]For the purposes of this survey, the route was assumed to be the present Haines Petroleum Pipeline right-of-way.

Creek 1) to document habitat utilization, 2) to estimate the size and composition of the wetland bird population, and 3) to determine the wetland bird productivity of the wetland habitats near the proposed route. Such knowledge is important to proper management of pipeline construction--including specific alignments, the types and timing of certain construction activities, and the extent and types of ground and aerial activities over and in these wetlands--if disturbance of nesting, molting, and migratory activities of wetland birds and destruction of wetland habitat is to be avoided.

STUDY AREA

The Tetlin-Northway Wetland study area included portions of the upper Tanana River, and the lower Nabesna River, Chisana River, and Scottie Creek drainages (see Fig. 1). It is a 730 square mile lowland extending for 72 miles in a southeasterly direction from the Tanana River bridge on the Alaska Highway at Milepost 1303 to Little Scottie Creek on the Alaska Highway at Milepost 1223. Maximum width of the wetland area is 18 miles, along a line from Tetlin Lake to Riverside Lodge. Emphasis of fieldwork was to sample the communities of birds most likely to experience impact from pipeline construction and operation; hence, the sampling effort was concentrated along the Alaska Highway (between Tetlin Junction and the U.S.-Canada Border) and along the Northway Road (between the Alaska Highway and the Northway Airport).

The vegetation on the study area is a complex mosaic of forested and treeless habitats typical of the northern taiga. The wetlands within the area are distributed in a spatially-diverse arrangement; e.g., within a square mile of lowland habitat, one may encounter several large and small lakes with shorelines in various stages of plant succession. The major wetland habitat types, which occur mainly in the lowland river valleys, but to a lesser extent in the uplands, may be catagorized as follows:

1. Large lakes (>0.500 mi^2), often with diverse shoreline marshes and floating mats.
2. Small lakes and ponds (<0.500 mi^2), often with, or adjacent to, other wetland types.
3. Floating mats in lakes and ponds--mostly Nymphaea sp., Hippuris sp., Calla palustris, Caltha sp., Myriophyllum sp., and important submerged species such as Potamogeton sp., Zanichellia sp., and Polygonum amphibium.
4. Marsh--emergent grasses, sedges, rushes, and horsetails--mostly Equisetum fluviatile, Scirpus validus, Carex aquatilis, Carex rostrata, Juncus sp., Arctophila fulva. Shoreline marshes are most frequent, but larger lakes have marshy islands of Scirpus validus and Typha latifolia growing in several feet of water.
5. Wet sedge meadow--mostly Eleocharis sp., Eriophorum angustifolium, Eriophorum callitrix, Eriophorum gracile, Eriophorum scheuchzeri, Trichophorum sp., Beckmannia erucaeformis.

6. Tussock bogs--mostly Eriophorum vaginatum.
7. Mudflats and river sandbars--ranging from frequently-flooded and barren flats, to dense grass meadows (Calamagrostis canadensis, Poa spp., Equisetum palustre, Equisetum arvense), to dense herbaceous growth (Senecio congestus).
8. Creeks and rivers.
9. Old river oxbow lakes and marshes.

The vegetative diversity in most taiga mosaic habitats arises from eight interrelated forces: forest fire, permafrost, alluviation, water table, soil type, slope, aspect, and spatial distribution of wetlands (Lutz 1956, Viereck 1970). A more thorough discussion of how these vegetation factors are associated with waterfowl habitats is given by McKnight (1962).

METHODS

A cabin at Riverside Lodge (Alaska Highway Milepost 1281) served as base camp from 28 May to 13 November 1977. Wetland sites along the Northway Road were selected for sampling on 13 June. Sites along the Alaska Highway from Tetlin Junction to Little Scottie Creek were selected between 14 and 17 June. Preliminary surveys to test methods and gain seasonal chronological data began on 17 June.

Forty-five wetland sites were censused, of which 34 were within 1 mile of the proposed Northwest Alaskan Gas Pipeline route. The 34 wetlands, collectively, were a nearly complete sample of the types of

habitats and populations of birds present near the pipeline route in 1977; they included 95% of the wetlands appearing on the 1:63,360 USGS Quadrangle Maps. The remaining 10 sites were located 1-5 miles from the route, along Scottie Creek and the Chisana River. These additional 10 sites were chosen to obtain a representative sample of lowland habitats in the center of the valley, away from possible disturbances associated with a nearby highway. They were selected according to ease of access by canoe. The total area of all 45 wetlands censused was 11.642 mi^2.

A "census" consisted of two persons walking in opposite directions around the shores of a marsh, pond, or small lake. All birds seen when the sample crew first arrived were recorded in order to prevent double-counting later, and all birds seen or flushed during the walk around the shoreline were counted. Large lakes were censused in a similar manner, except a canoe and 30-power spotting scope were used. When the crew first arrived at a large lake, a count of all birds visible through scope and binoculars was made. The crew then paddled along the shoreline and recorded all birds seen. The largest lakes were subdivided into sections, which were then censused sequentially.

Each of the 45 wetland sites was censused once. Censuses were conducted between 0600 and 2200, Alaska Standard Time. Censusing began 6 July 1977 and progressed southeastward towards Canada. Censusing was completed 25 July. Choice of the census period was intended to follow the hatching of most eggs so that broods of young birds could be counted. In this manner, an estimate of production as well as adult population could be made.

FISHERIES SURVEY OF TANANA RIVER TRIBUTARIES ALONG THE ALCAN GAS PIPELINE ROUTE

TR-2-1

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reports moderate runs of round and humpback whitefish, as well as some grayling in spring and fall, presumably to and from Island Lake. Van Hyning (1976) reports similar findings. Electrofishing in Desper Creek yielded no fish, although the habitat looks very favorable for northern pike. Mr. Greyhead also reports that Desper Creek freezes solidly in winter.

Scottie Creek

Scottie Creek flows in a very deep, earthen channel with steep banks. It originates in several small lakes in Canada about 20 miles northeast of the highway and flows south and then west into the Chisana River. The water in Scottie Creek is strongly humic-stained and flows at a rate of about 190 cfs where it is spanned by the highway.

Mr. Stag Thompson (1976), who lives adjacent to Scottie Creek, reports large runs of humpback whitefish and grayling in spring and fall. Other fishes include a sizable population of various sizes of northern pike, burbot, longnose suckers, and sculpin. Thompson reports having caught northern pike of 10 to 15 pounds downstream of the highway. Van Hyning (1976) reports a similar species composition for this creek.

The macroinvertebrate fauna of Scottie Creek includes an abundance of siphlonurid mayflies and dytiscid beetles.