

APPENDIX H
CREAMER'S FIELD MIGRATORY WATERFOWL REFUGE
RESOURCE INVENTORY

RESOURCE INVENTORY
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HISTORY

Creamer's Field was originally cleared in the early 1900's as part of the Hinckley Dairy operation, and by 1928 when Charles Creamer assumed ownership, the field had already acquired the reputation of a resting area for waterfowl during their spring migrations northward. Because interest in this annual event grew along with the population of Fairbanks, there was serious concern for the fate of the field in 1967 when Charles Creamer decided to sell the farm. At this time the Alaska Department of Fish and Game (ADF&G) became interested in acquiring the land to be managed as a wildlife, educational, and recreational area.

By January 1968, through the combined efforts of individuals and the Alaska Conservation Society, enough money was raised to secure the option to purchase Creamer's Field for ADF&G. A bill introduced by Governor Walter J. Hickel requesting an appropriation to be used toward the purchase of the field was passed in April by both the House and the Senate. Shortly thereafter, the additional funds necessary to complete the purchase were appropriated by the Pittman-Robertson Federal Aid to the Wildlife Restoration Program. In mid-1968 ADF&G assumed management responsibility of the 247.5-acre Creamer's Field area and the previously private 12-acre plot situated near the center of Creamer's Field was acquired in 1982.

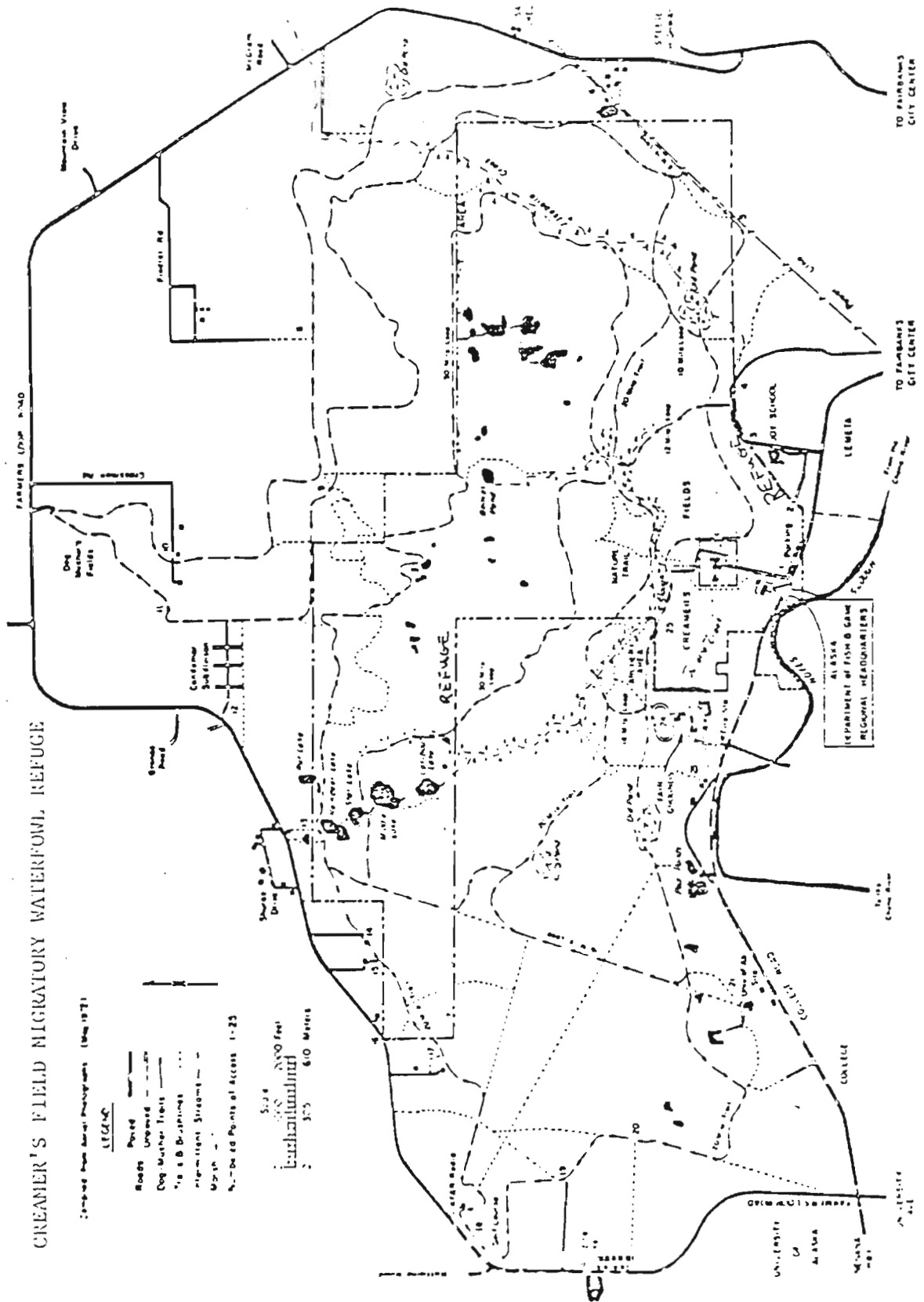
In 1968 Alaska Division of Lands was requested to transfer management authority of a 1,524-acre tract of state land situated immediately north of Creamer's Field to ADF&G. Until 1974 the 1,776-acre tract known as the Fairbanks Wildlife Management Area was managed cooperatively by ADF&G and Department of Natural Resources. In 1974 the Alaska Legislature voted to give the area state refuge status and the name Creamer's Field Migratory Waterfowl Refuge.

DESCRIPTION

Creamer's Field Migratory Waterfowl Refuge is located immediately north of Fairbanks. Its 1,776 acres encompass approximately one-third of the land mass surrounded by College Road on the south and Farmers Loop on the north, east, and west. In addition, ADF&G owns an 8.5-acre parcel situated south of College Road which is not within the refuge boundaries but was part of the 1968 Creamer's Field purchase and is managed by ADF&G (Map 1).

The irregular boundary of the refuge is approximately 9 miles in length. Much of the land adjacent to the refuge is in private ownership. The lands not in private ownership belong to public agencies which include the University of Alaska (UAF) and the Fairbanks North Star Borough (FNSB). The 4 buildings formerly used in the Creamer's Dairy operation are listed in the register of state and national historical sites. These buildings now are used for either storage or office space. In 1987 the Department initiated plans to

Map 1.



GREENER'S FIELD MIGRATORY WATERFOWL REFUGE

Compiled from Aerial Photographs (May 1971)

LEGEND

- Roads Paved ———
- Unpaved - - - - -
- Dog Wash Trails ———
- 1/8 & 1/4 Bushings - - - - -
- High Light Stream ———
- Grass - - - - -
- N. - 00 10 Points of Access 1-23

Scale
 1:50,000
 1 inch = 500 feet
 1 centimeter = 50 meters

ALASKA
 DEPARTMENT OF FISH & GAME
 REGIONAL HEADQUARTERS

renovate the inside of the former farm house for use as refuge headquarters and visitor center.

The information in this inventory comes from Michael A. Spindler's master's thesis, Ecological Survey of the Birds, Mammals, and Vegetation of Fairbanks Wildlife Management Area, December 1976, University of Alaska--Fairbanks, and Department files.

PHYSICAL ENVIRONMENT

Climate

Fairbanks has an average daily maximum temperature of 38.4°F, an average daily minimum of 16.2°F and a mean annual temperature of 25.7°F. Temperatures range from a record high of 99°F to a record low of -65°F. Temperatures are likely to be more extreme in the low-lying bog flats of the refuge than at the National Weather Service (ESSH) station near Fairbanks International Airport.

The frost-free season begins, on the average, on May 21 and ends approximately August 30. The transition between winter and summer and vice versa is quite rapid, occurring in about one and a half months.

Mean annual total precipitation for Fairbanks is 12.2 inches. August is the wettest month, averaging 2.4 inches of rainfall and April, the driest month, averages less than half an inch. Fairbanks receives a mean annual snowfall of 50.6 inches (water equivalent of 3.7 inches). Greatest snowfall occurs in January with an average of 10.9 inches.

Soils

Soil types in the Fairbanks area have been mapped by the USDA Soil Conservation Service (Reiger et al. 1963). A detailed soils map of the refuge was compiled from that information (Appendix 1). Soils in the refuge are for the most part alluvially deposited materials of glacial origin, although the area itself was never glaciated. The major soil types present are recorded as follows (Map 2):

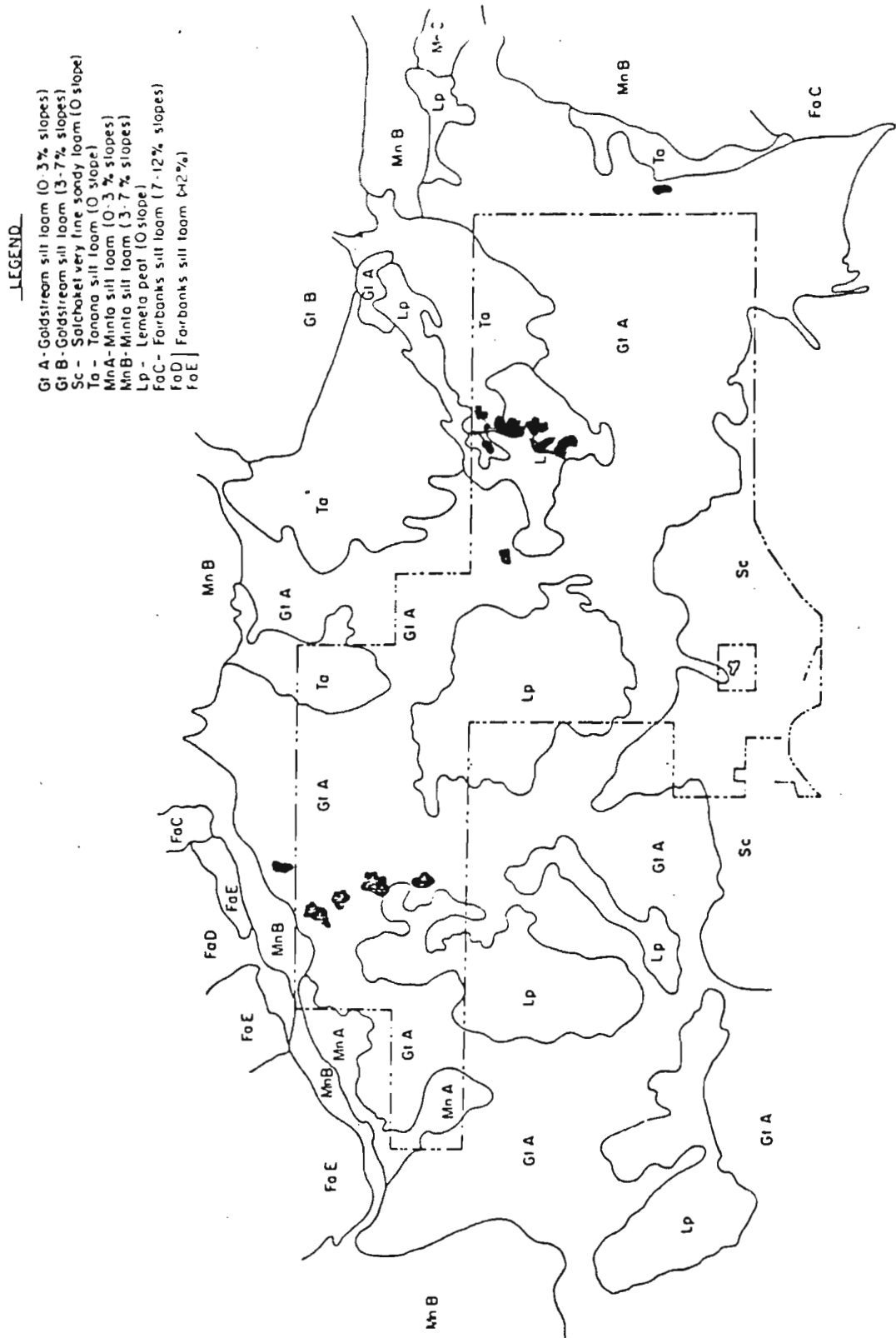
Goldstream silt loam is the most extensive soil comprising muskegs on the refuge. It is alluvial in nature and overlies layers of gravel. Quite often the surface vegetation is tussock meadows with visible polygon patterns. Permafrost is usually within 1 meter of the surface.

Lemeta peat has accumulated in shallow lakes on the alluvial floodplain. Remnants of these lakes appear as old lake beds filled with marsh vegetation, or covered by floating bog mats. Some peat areas are now forested with black spruce and may represent the climax stage of hydrosere. Permafrost is usually within 0.5 meters of the surface except in wet situations where it may be very deep.

Salchaket--very fine sandy loam covers most of the field. This stratified alluvial soil is the only soil presently occurring in the geologically active Chena-Tanana Floodplain. It is composed of predominant layers of sandy material and interspersed with silty layers over a gravel substrate. Gravel depth varies from

CREAMER'S FIELD MIGRATORY WATERFOWL REFUGE SOIL TYPE MAP

(Based on U.S. Department of Agriculture, Soil Conservation Service Soil Survey of the Fairbanks Area (1967))



0.3 meters to more than 2 meters and fluctuates greatly even over short distances. Permafrost is usually over 10 meters deep in this well-drained soil.

Tanana silt loam is dominated by silt but may contain sand and ice lenses at any depth. It is generally covered by vegetation of black spruce, tamarack, birch, and willow. Permafrost is usually within 1 meter of the surface.

Geology

Creamers Field Migratory Waterfowl Refuge lies at the base of the Yukon-Tanana uplands, a westward trending highland of mature rounded hills between the Yukon and Tanana Rivers. Most of the refuge is located on the Tanana lowlands, a wide, sediment-filled valley between the Yukon-Tanana uplands to the north and the Alaska Range to the south, draining westward to the Yukon River. The region was not glaciated, but was literally surrounded by mountain glaciers during the Wisconsin Times (20,000-100,000 years ago), and abounds with the end products of glacial erosion.

Pewe (1958) identifies 4 geologic units underlying the refuge (Map 3).

Floodplain alluvium underlies the fields in the southern portion of the refuge. This unit is well drained and in the past was part of the Chena and Tanana floodplains. The surface silt in this area is 0.3 to 4.5 meters in depth and is often underlain by alternating layers of sand and gravel. The surface of this geologic unit is essentially flat with undulating swales and low ridges 0.5 to 1.0 meters high.

Perennially frozen undifferentiated silt is restricted to the bases of the hills and creek bottoms in the northern portion of the refuge. This unit is composed primarily of retransported loess and varies in thickness from 1-95 meters.

Perennially frozen organic silt occurs extensively underneath most of the polygonized bog flats covering the majority of the refuge. It is the characteristic geologic unit underlying the cave-in lakes, thaw ponds, and patterned ground common on the refuge.

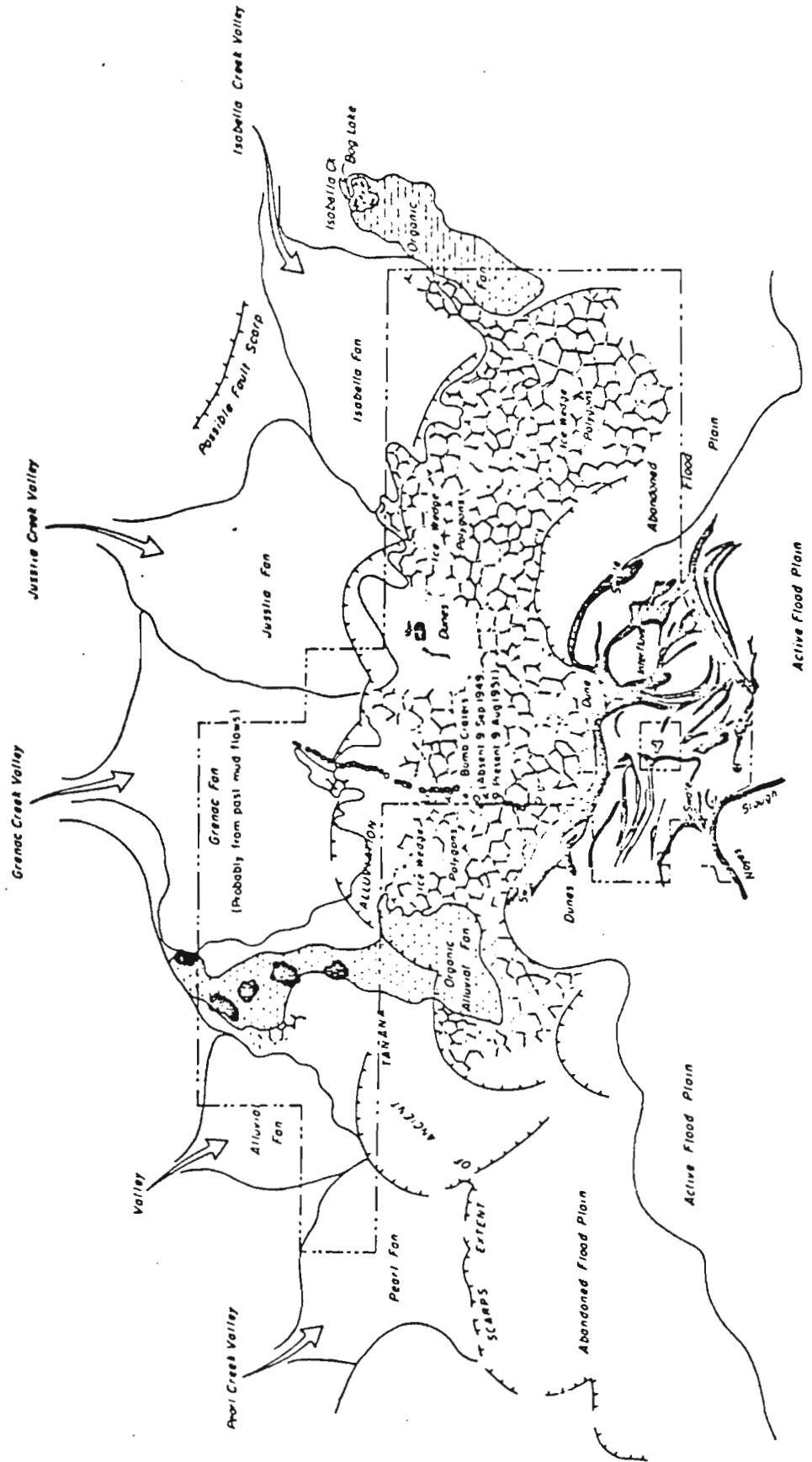
Perennially frozen peat occurs only to a limited extent along the south boundary and is characteristic of old lake basins. This formation is approximately 6 meters in thickness.

Hydrology

The refuge is drained by two creeks. Juliette Creek originates north of the old farm buildings and then turns west behind the barns and drains into Noyes Slough and the Chena River. Isabella Creek originates in the hills above Farmers Loop and McGrath Road and proceeds in a southwesterly direction across the bog flats and into Noyes Slough. It is only during break-up and extreme flooding

Map 3.

CREAMER'S FIELD MIGRATORY WATERFOWL REFUGE GEOLOGY TYPE MAP



conditions that conventional drainage occurs on the refuge. At other times drainage patterns are complex and involve sheet flow, beaded drainage systems, and intermittent, localized seeps.

The chain of lakes located in the northwestern portion of the refuge is characteristic of thermokarst topography. These small lakes both drain the surrounding area and recharge the active layer with ground water. These lakes are shallow, averaging 6 feet in depth.

A chain of ponds with waterfowl nesting islands was constructed on the refuge between 1984 and 1987. The ponds are from 1 to 3 acres in size and are up to 4 feet deep. Upland areas northeast of the refuge drain into these ponds during break-up and rainy periods.

Permafrost

The entire area is underlain by permafrost which varies in depth from 12 meters to less than 0.25 meters. Permafrost is farthest below the surface in the field area and nearest the surface in the black spruce bog lands. The distribution of permafrost and its depth below the surface are major factors contributing to the vegetation and drainage patterns.

BIOLOGICAL RESOURCES

Vegetation

A total of 250 plant taxa have been identified on the refuge. These taxa include 7 trees; 12 tall shrubs; 23 low shrubs; 85 herbs; 29 grasses, sedges, or rushes; 45 mosses; and 50 lichens. Spindler (1976) described each of the 6 vegetation types found on the refuge (Table 1 and 2, Map 4):

Coniferous forest - Nearly pure stands of black spruce (Picea mariana) cover 25% of the refuge, while pure white spruce (Picea glauca) and tamarack (Larix laricina) as well as mixed coniferous stands were observed less frequently.

Deciduous forest - The most common deciduous forest type is birch-willow. Large areas of previously burned tussock meadows have been converted to paper birch (Betula papyrifera) stands interspersed with dense Salix spp. clumps. Pure deciduous stands are not extensive on the refuge bog flats, covering about 7% of the area.

Tall shrub - About 16% of refuge vegetative cover is tall dense stands of shrubs. Two types are recognized, nearly pure willow (Salix spp.) stands, and mixed tall shrubs. The mixed tall shrub-type is usually comprised of Alnus incana and Salix bebbiana.

Tussock-low shrub bog - Bogs of mixed heaths and sedge tussocks cover approximately 23% of the refuge. The tussocks encompass

Table 1. Habitat types on Creamer's Field Migratory Waterfowl Refuge, as determined from grid sampling of 1,168 points.

Habitat	Percent of Area	Acres	Hectares
Coniferous forest			
white spruce dominant	5.0	90.2	36.5
black spruce dominant	25.9	479.1	194.0
tamarack (larch) dominant	4.1	76.0	30.8
Deciduous forest	6.3	123.8	50.1
Tall shrub	16.2	300.6	121.7
Tussock-low shrub	22.7	420.8	170.4
Herbaceous bog	2.4	60.1	24.3
Fields	15.4	285.0	115.4
Lakes and ponds	<u>2.0</u>	<u>14.5</u>	<u>5.9</u>
Totals	100.0	1,850.1 acres*	749.1 ha.*

* Total area is somewhat larger than actual area of the refuge because data were collected utilizing a buffer strip or "area of interest" surrounding the actual boundary.

Table 2.

TREES

<u>Betula papyrifera</u> subsp. <u>humilis</u>	paper birch
<u>Larix laricina</u> var. <u>alaskensis</u>	tamarack
<u>Picea glauca</u>	white spruce
<u>Picea mariana</u>	black spruce
<u>Populus balsamifera</u> subsp. <u>balsamifera</u>	balsam poplar
<u>Populus tremuloides</u>	quaking aspen
<u>Prunus pedus</u> (naturalized)	chokecherry

TALL SHRUBS

<u>Alnus incana</u> subsp. <u>tenuifolia</u>	thinleaf alder
<u>Betula glandulosa</u>	shrub birch
<u>Betula glandulosa</u> x <u>papyrifera</u>	
<u>Salix alaxensis</u>	feltleaf willow
<u>Salix arbusculoides</u>	littletree willow
<u>Salix bebbiana</u>	Bebb willow
<u>Salix brachycarpa</u> subsp. <u>niphoclada</u>	barren-ground willow
<u>Salix candida</u>	silver willow
<u>Salix glauca</u>	grayleaf willow
<u>Salix monticola</u>	park willow
<u>Salix novae-angliae</u>	tall blueberry willow
<u>Salix planifolia</u> subsp. <u>pulchra</u>	diamondleaf willow

LOW SHRUBS

<u>Andromeda polifolia</u>	bog rosemary
<u>Arctostaphylos rubra</u>	red-fruit bearberry
<u>Arctostaphylos uva-ursi</u> var. <u>uva-ursi</u>	kinnikinnick
<u>Betula nana</u> subsp. <u>exilis</u>	dwarf birch
<u>Chamaedaphne calyculata</u>	leatherleaf, cassandra
<u>Empetrum nigrum</u> subsp. <u>hermaphroditum</u>	crowberry
<u>Ledum palustre</u> subsp. <u>decumbens</u>	narrowleaf Labrador tea
<u>Ledum palustre</u> subsp. <u>groenlandicum</u>	Labrador tea
<u>Linnaea borealis</u>	twinflower
<u>Myrica gale</u> var. <u>tomentosa</u>	sweet gale
<u>Oxycoccus microcarpus</u>	bog cranberry
<u>Potentilla fruticosa</u>	bush cinquefoil
<u>Ribes Hudsonianum</u>	northern black currant
<u>Ribes triste</u>	American red currant
<u>Rosa acicularis</u>	prickly rose, rose hip
<u>Rubus idaeus</u> subsp. <u>melanolasius</u>	raspberry
<u>Salix fuscescens</u>	Alaska bog willow
<u>Salix myrtillifolia</u>	low blueberry willow
<u>Shepherdia canadensis</u>	buffaloberry, soapberry
<u>Spiraea Beauverdiana</u>	Alaska spiraea
<u>Vaccinium uliginosum</u> subsp. <u>alpinum</u>	bog blueberry
<u>Vaccinium vitis-idaea</u> subsp. <u>minus</u>	lingonberry
<u>Viburnum edule</u>	highbush cranberry

Table 2 (cont'd)

HERBS

<u>Achillea sibirica</u>	yarrow
<u>Aconitum delphinifolium</u> subsp. <u>delphinifolium</u>	monkshood
<u>Amerorchis rotundifolia</u>	rhizome orchis
<u>Anemone Richardsonii</u>	anemone
<u>Astragalus</u> sp.	milk vetch
<u>Brassica rapa</u>	bird's rape
<u>Calla palustris</u>	wild calla
<u>Caltha natans</u>	
<u>Caltha palustris</u>	marsh marigold
<u>Cardamine</u> sp.	bitter cress
<u>Castilleja caudata</u>	Indian paintbrush
<u>Chrysosplenium tetrandrum</u>	northern water carpet
<u>Chrysosplenium Wrightii</u>	water carpet
<u>Cicuta mackenzieana</u>	water hemlock
<u>Corallorrhiza trifida</u>	coral root
<u>Cornus canadensis</u>	bunchberry
<u>Cornus canadensis</u> x <u>suecica</u>	
<u>Cypripedium guttatum</u> subsp. <u>guttatum</u>	lady's slipper
<u>Draba</u> sp.	
<u>Drosera rotundifolia</u>	sundew
<u>Epilobium angustifolium</u>	fireweed
<u>Epilobium palustre</u>	willow-herb
<u>Equisetum arvense</u>	horsetail
<u>Equisetum fluviatile</u>	horsetail
<u>Equisetum palustre</u>	horsetail
<u>Equisetum pratense</u>	horsetail
<u>Equisetum scirpoides</u>	horsetail
<u>Equisetum silvaticum</u>	horsetail
<u>Equisetum variegatum</u> subsp. <u>variegatum</u>	horsetail
<u>Erigeron</u> sp.	fleabane
<u>Fragaria virginiana</u> subsp. <u>glauca</u>	wild strawberry
<u>Galeopsis bifida</u>	hemp nettle
<u>Galium boreale</u>	bedstraw
<u>Galium trifidum</u> subsp. <u>trifidum</u>	bedstraw
<u>Geocaulon lividum</u>	
<u>Hammarbya paludosa</u>	
<u>Hippuris vulgaris</u>	mare's tail
<u>Iris setosa</u> subsp. <u>interior</u>	wild flag
<u>Lemna minor</u>	duckweed
<u>Lycopodium annotinum</u> subsp. <u>pungens</u>	stiff clubmoss
<u>Menyanthes trifoliata</u>	buckbean
<u>Mertensia paniculata</u>	bluebells
<u>Moehringia lateriflora</u>	grove sandwort
<u>Moneses uniflora</u>	wood nymph
<u>Myriophyllum spicatum</u>	water milfoil
<u>Nuphar polysepalum</u>	yellow pond lily
<u>Oxytropis campestris</u> subsp. <u>gracilis</u>	
<u>Parnassia palustris</u> subsp. <u>neogaea</u>	n. grass of parnassus

Table 2 (cont'd)

HERBS

<u>Pedicularis labradorica</u>	lousewort
<u>Petasites frigidus</u>	sweet coltsfoot
<u>Petasites sagittatus</u>	sweet coltsfoot
<u>Pinguicula villosa</u>	
<u>Platanthera obtusata</u>	bog orchid
<u>Polemonium acutiflorum</u>	Jacob's ladder
<u>Polygonum alaskanum</u> subsp. <u>glabrescens</u>	smartweed
<u>Polygonum pennsylvanicum</u> subsp. <u>Oneillii</u>	smartweed
<u>Potentilla norvegica</u> subsp. <u>monspeliensis</u>	cinquefoil
<u>Potentilla palustris</u>	marsh fivefinger
<u>Pyrola asarifolia</u> var. <u>purpurea</u>	wintergreen
<u>Pyrola grandiflora</u>	wintergreen
<u>Pyrola minor</u>	wintergreen
<u>Pyrola secunda</u>	wintergreen
<u>Ranunculus lapponicus</u>	buttercup
<u>Ranunculus trichophyllus</u> var. <u>trichophyllus</u>	white water crowfoot
<u>Rubus arcticus</u> subsp. <u>acaulis</u>	nagoonberry
<u>Rubus chamaemorus</u>	cloudberry
<u>Rumex arcticus</u>	sorrel
<u>Rumex crispus</u>	curly dock
<u>Saussurea angustifolia</u>	
<u>Senecio lugens</u>	groundsel
<u>Solidago canadensis</u> var. <u>salebrosa</u>	goldenrod
<u>Spiranthes Romanzoffiana</u>	ladies' tresses
<u>Stellaria crassifolia</u>	chickweed
<u>Stellaria laeta</u>	chickweed
<u>Stellaria longifolia</u>	chickweed
<u>Stellaria longipes</u>	chickweed
<u>Taraxacum</u> sp.	dandelion
<u>Thalictrum sparsiflorum</u>	meadow rue
<u>Tofieldia pusilla</u>	false asphodel
<u>Trientalis europaea</u>	starflower
<u>Typha latifolia</u>	cattail
<u>Valeriana capitata</u>	valerian
<u>Vicia</u> sp.	vetch
<u>Viola biflora</u>	violet
<u>Viola epipsila</u> subsp. <u>repens</u>	marsh violet

GRASSES, SEDGES, and RUSHES

<u>Agropyron repens</u>	quack grass
<u>Agrostis scabra</u>	bent grass
<u>Arctagrostis latifolia</u>	polar grass
<u>Bromus inermis</u>	brome
<u>Calamagrostis canadensis</u>	reed bent grass
<u>Carex aquatilis</u> subsp. <u>aquatilis</u>	sedge
<u>Carex aurea</u>	sedge

Table 2 (cont'd)

GRASSES, SEDGES, and RUSHES

<u>Carex Bigelowii</u>	sedge
<u>Carex canescens</u>	sedge
<u>Carex capillaris</u>	sedge
<u>Carex chordorrhiza</u>	sedge
<u>Carex diandra</u>	sedge
<u>Carex limosa</u>	sedge
<u>Carex lugens</u>	sedge
<u>Carex magellanica</u> subsp. <u>irrigua</u>	sedge
<u>Carex rostrata</u>	sedge
<u>Carex rotundata</u>	sedge
<u>Carex supina</u> subsp. <u>spaniocarpa</u>	sedge
<u>Eleocharis palustris</u>	spike-rush
<u>Eriophorum angustifolium</u>	cottongrass
<u>Eriophorum brachyantherum</u>	cottongrass
<u>Eriophorum gracile</u>	cottongrass
<u>Eriophorum russeolum</u>	cottongrass
<u>Eriophorum Scheuchzeri</u>	cottongrass
<u>Eriophorum vaginatum</u>	cottongrass
<u>Luzula parviflora</u> subsp. <u>parviflora</u>	wood rush
<u>Luzula rufescens</u>	wood rush
<u>Poa glauca</u>	
<u>Poa pratensis</u>	blue grass

MOSSES

<u>Aulacomnium palustre</u>
<u>Blepharostoma trichophyllum</u>
<u>Bryum bimum</u>
<u>Calligeron richardsonii</u>
<u>Calypogeia neesiana</u>
<u>Cephalozia bicuspidata</u>
<u>Cephalozia pleniceps</u>
<u>Cephaloziella rubella</u>
<u>Dieranum undulatum</u>
<u>Ditrichum flexicaule</u>
<u>Drepanocladus exannulatus</u>
<u>Drepanocladus fluitans</u>
<u>Drepanocladus uncinatus</u>
<u>Drepanocladus vernicosus</u>
<u>Gymnocollea inflata</u>
<u>Helodium blandowii</u>
<u>Hylocomium splendens</u>
<u>Meesia triquetra</u>
<u>Mnium glabrescens</u>
<u>Mylia anomala</u>
<u>Myurella tenerrima</u>
<u>Pleurozium schreberi</u>

Table 2 (cont'd)

MOSSES

Pohlia nutans
Polytrichum commune
Polytrichum juniperinum
Polytrichum strictum
Scapania irrigua
Scapania parvifolia
Sphagnum capillaceum
Sphagnum capillaceum var. tenellum
Sphagnum fimbriatum
Sphagnum fuscum
Sphagnum girgensohnii
Sphagnum maaellanicum
Sphanum obtusum
Sphagnum recurvatum var. amblyphyllum
Sphagnum recurvatur var. tenue
Sphagnum riparium
Sphagnum russowii
Sphagnum squarrosum
Sphagnum subsecundum var. contortum
Sphagnum teres
Sphagnum warnstorffii
Splachnum vasculosum
Tomenthypnum nitens

LICHENS

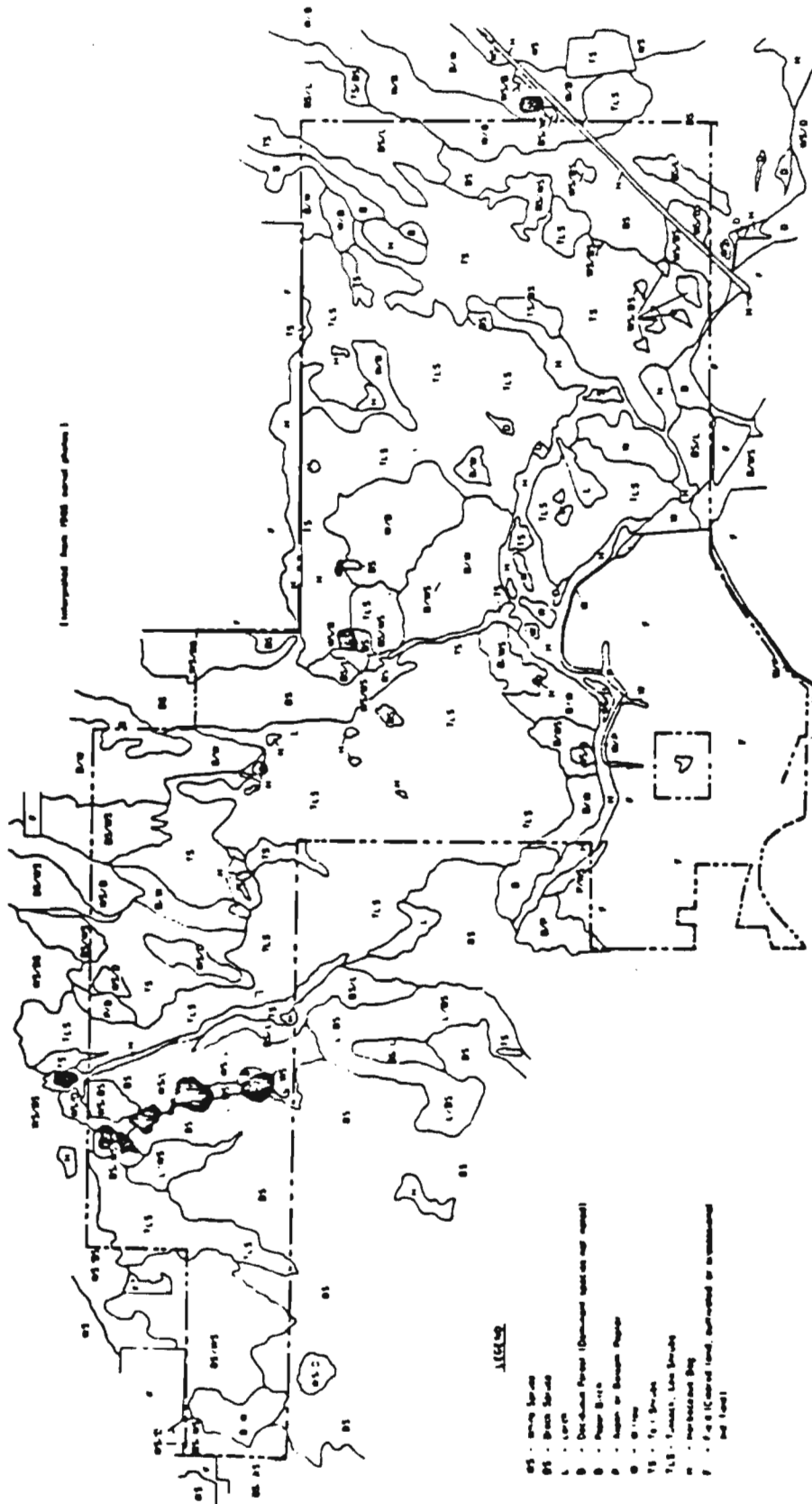
Alectoria fremontii
Alectoria nadvornikiana
Alectoria nidulifera
Cetraria ciliaris
Cetraria cucullata
Cetraria ericetorum
Cetraria islandica
Cetraria merrillii
Cetraria pinastri
Cetraria platyphylla
Cetraria serpincola
Cladina arbuscula
Cladonia mitis
Cladonia amaurocraea
Cladonia botrytes
Cladonia carneola
Cladonia chlorophaea
Cladonia coccifera
Cladonia coniocraea
Cladonia cornuta
Cladonia furcata

Table 2 (cont'd)

Cladonia gonecha
Cladonia gracilis var. dilatata
Cladonia mitis
Cladonia pinastris
Cladonia rangiferina
Cladonia scabruisculsa
Cladonia sepincola
Cladonia sylvatica
Dactylina sp.
Evernia mesomorpha
Hypogymnia austerodes
Hypogymnia physodes
Nephroma arcticum
Parmelia saxatilis
Parmelia sulcata
Peltigera apthosa
Peltigera canina
Peltigera leucophlebia
Peltigera malacea
Peltigera membranacea
Peltigera polydactyla
Peltigera scabra
Peltigera spuria
Physcia aipolia
Ramalina fastigiata
Ramilina roesleri
Stereocaulon tomentosum
Usnea fulvoreagens
Xylographa abietina

Map 4.

CREAMER'S FIELD MIGRATORY WATERFOWL REFUGE VEGETATION TYPE MAP



a gradient from cotton grass (Eriophorum vaginatum) tussocks, to sphagnum covered Eriophorum tussocks, with dense growth of ericaceous shrubs such as blueberry (Vaccinium uliginosum), lingonberry (V. vitis-idaea), Labrador tea (Ledum palastre), Cassandra (Chamaedaphne calyculata), and cranberry (Oxycoccus microcarpus). Low shrub cover consists of shrub birch (Betula glandulosa), dwarf birch (B. nana), and willow (Salix spp.).

Marshes and sedge bogs - This vegetative type covers about 3% of the refuge. They usually consist of emergent sedges (Carex spp.) with aquatic species such as marsh firefinger (Potentilla palustris), wild calla (Calla palustris), (Ranunculus trichophyllis), Hippuris vulgaris and Caltha palustris.

Cleared land - About 15% of the refuge is cultivated for barley and oats, and for perennial brome hay.

Proposed Habitat Enhancement

More of the cultivated fields are to be taken out of hay production and switched to barley. This switch is to make the area more attractive to sandhill cranes. Another pond will be built north of these fields. The pond will be shallow and 5-10 acres in size with islands. The spoil banks will be planted to barley to act as an attractant to cranes. The objective behind this project is to lure the cranes away from the Fairbanks International Airport and university agriculture fields. Their current behavior is causing safety problems at the airport when they fly from the agriculture fields to the airport crossing, the runway before coming to rest along a shallow pond. Habitat modification is being initiated at both the airport and university to discourage the cranes from using those sites.

Waterfowl Habitat Enhancement

In 1987 revenue from the Alaska Waterfowl Conservation Stamp (duck stamp) program and matching funds from Duck's Unlimited, Inc. (DU) paid for the construction of 6 interconnected ponds with nesting islands. Very little waterfowl nesting habitat was available previously due to lack of permanent water bodies with safe nesting sites. This project will provide viewing, photographic, educational, and waterfowl hunting opportunities.

Faunal Diversity

Because the refuge offers a range of vegetative communities, it can support a variety of fauna within its boundaries. Some of the vegetative communities are in various stages of natural succession and some have reached the climax stage. The last major change in the vegetation resulted from a 1954 fire that burned 520 acres. Because much of the refuge is underlaid with permafrost, vegetative succession in the burn has been very slow. Most of the area remains a stunted willow/birch stage making it ideal moose and upland game habitat.

The fields are maintained through clearing and cultivation. Old fields now choked with willows are being reclaimed for productive grain/hay fields. One of the willow communities near the fields had lanes cleared through it to stimulate shrubs for moose habitat.

However, no effort has been made to manage habitat on most of the refuge. The 1987 pond construction project converted approximately 20 acres of black spruce/tussock bog to waterfowl habitat.

Birds

A total of 150 bird species occur on the refuge during some time of the year. Of these, 20 are residents, 57 are migrants, 55 are breeders, and 18 are occasional visitors (Table 3). Of special interest are the concentrations of waterfowl that utilize the area, particularly during the spring migration. In the latter part of April concentrations sometimes numbering in the thousands are found on the field as well as on most of the lakes. The primary waterfowl species visiting the refuge include: Canada geese (Branta canadensis), white-fronted geese (Anser albitrons), pintail (Anas acuta), wigeon (Anas americana), mallard (Anas platyrhynchos), shoveler (Anas clypeata), and green-winged teal (Anas crecca). In addition, many shorebirds, raptors, and numerous species of passerines pass through the area between mid-April and early June.

The most common species nesting on the refuge lakes and ponds are pintail, wigeon, shoveler, and yellowlegs (Tringa melanolencus).

Nonbreeding sandhill cranes (Grus canadensis) are found in the fields and on the new pond project where they feed relatively safely because of the openness of each area.

Amphibians

The only amphibian recorded for this area is the wood frog (Rana sylvatica).

Other Avifauna

Spruce grouse (Dendragapus canadensis), sharp-tailed grouse (Tympanuchus phasianellus), and ruffed grouse (Bonasa umbellus) are present throughout the year on the refuge. Willow ptarmigan (Lagopus lagopus) are present only during winter. All 4 species are hunted. No information is available on hunting success.

Mammals

Sixteen species of mammals commonly utilize the refuge (Table 4). Moose (Alces alces) are found throughout the refuge. Forty moose were counted during November 1985 aerial surveys and only 11 moose were counted in November 1987. The refuge is open to bow hunting for moose but records show few being shot annually.

The 15 other mammals include 2 species of shrews, snowshoe hare, 7 species of rodents, red fox, black bear, and 3 species of mustelids. In addition, pigmy shrews, northern bog lemmings, meadow jumping mice, and lynx may occasionally utilize the area.

Table 3. Annotated bird list for Creamer's Field Migratory Waterfowl Refuge (Spindler 1976).

The following classifications are used:

R	=	resident
M	=	migrant
B	=	breeder, or probable breeder
V	=	visitor
S	=	summer
F	=	fall
W	=	winter
*	=	uncommon
+	=	rare or accidental

GAVIIFORMES GAVIDAE	
common loon	M
arctic loon	M
PODICIPEDIFORMES POCIDIPEDIDAE	
rednecked grebe	B
horned grebe	B
ANSERIFORMES ANATIDAE	
<u>Cygninae</u>	
whistling swan	M
trumpeter swan	M
<u>Anserinae</u>	
Canada goose	M, S V
whitefronted goose	M
snow goose	M
<u>Anatinae</u>	
mallard	B
gadwall*	M, S V
pintail	B
greenwinged teal	B
bluewinged teal*	B
European wigeon+	M
American wigeon	B
shoveler	B
<u>Aythinae</u>	
redhead	M
ringnecked duck	M
canvasback	M
greater scaup	M
lesser scaup	B
common goldeneye	M, S V

Table 3 (cont'd).

<u>Aythya</u>	
Barrow's goldeneye	M
bufflehead	B
oldsquaw	M
white-winged scoter	M
surf scoter	M
FALCONIFORMES	
ACCIPITRIDAE	
goshawk	R
sharp-shinned hawk	B
red-tailed hawk	B
Harlan's hawk	B
Swainson's hawk	M, S V
rough-legged hawk	M
golden eagle	M
bald eagle	M
marsh hawk	B
PANDIONIDAE	
osprey	M
FALCONIDAE	
gyrfalcon	M
peregrine falcon	M
merline	M
kestrel	B
GALLIFORMES	
TETRAONIDAE	
spruce grouse	R
ruffed grouse	R
willow ptarmigan	W V
rock ptarmigan	W V
sharptailed grouse	R
GRUIFORMES	
GRUIDAE	
gray crane+	M
sandhill crane	B
RALLIDAE	
American coot+	M
CHARADRIIFORMES	
CHARADRIIDAE	
semipalmated plover	M
killdeer*	M
American golden plover	M
black-bellied plover	M
SCOLOPACIDAE	
common snipe	B
whimbrel	M
upland plover	M
spotted sandpiper	M
solitary sandpiper	B
lesser yellowlegs	B

Table 3 (cont'd).

SCOLOPACIDAE (cont'd)	
pectoral sandpiper	M
whiterumped sandpiper+	M
Baird's sandpiper	M
least sandpiper	M
dunlin*	M
longbilled dowitcher	M
semipalmated sandpiper	M
western sandpiper*	M
hudsonian godwit+	M
PHALAROPODIDAE	
northern phalarope	B
STERCORARIIDAE	
longtailed jaeger	M
LARIDAE	
herring gull	M
mew gull	B
Bonaparte's gull	M
arctic tern	M
COLUMBIFORMES	
COLUMBIDAE	
rock dove	R
mourning dove+	M
STRIGIFORMES	
STRIGIDAE	
great horned owl	R
snowy owl*	M, W V
hawkowl	R
great gray owl*	R
shorteared owl	B
boreal owl	R
CAPRIMULGIFORMES	
CAPRIMULGIDAE	
common nighthawk+	M
APODIFORMES	
TROCHILIDAE	
rufous hummingbird*	S V
CORACIIFORMES	
ALCEDINIDAE	
belted kingfisher	V
PICIFORMES	
PICIDAE	
yellowshafted flicker	B
hairy woodpecker	R
downy woodpecker	R
blbk threetoed woodpecker*	R
northern threetoed woodpecker	R
PASSERIFORMES	
TYRANNIDAE	
Say's phoebe	B

Table 3 (cont'd).

TYRANNIDAE (cont'd)	
alder flycatcher	B
Hammond's flycatcher	B
western wood pewee	B
olivesided flycatcher	B
ALAUDIDAE	
horned lark	M
HIRUNDINIDAE	
violetgreen swallow	B
tree swallow	B
bank swallow	M, S V
barn swallow+	B
cliff swallow	B
CORVIDAE	
gray jay	R
blackbilled magpie	V
common raven	B
Clark's nutcracker+	F V
PARIDAE	
blackcapped chickadee	R
grayheaded chickadee*	W V
boreal chickadee	R
CERTHIIDAE	
brown creeper*	R
TURDIDAE	
robin	B
varied thrush	B
hermit thrush	B
Swainson's thrush	B
graycheeked thrush	B
mountain bluebird+	M, S V
wheatear	M
Townsend's solitaire*	M
SYLVIIDAE	
arctic warbler	M
rubycrowned kinglet	B
MOTACILLIDAE	
water pipit	M
BOMBYCILLIDAE	
bohemian waxwing	B, W V
LANIIDAE	
northern shrike	R
STURNIDAE	
starling+	B
PARULIDAE	
orange-crowned warbler	B
yellow warbler	B
myrtle warbler	B
Townsend's warbler	F V
blackpoll warbler	B

Table '3 (cont'd).

PARULIDAE (cont'd)	
northern waterthrush	B
Wilson's warbler	B
ICTERIDAE	
rusty blackbird	B
FRINGILLIDAE	
pine grosbeak	R
graycrowned rosy finch	M
hoary redpoll	M V
common redpoll	R
pine siskin	S V, F V
whitewinged crossbill	R
savannah sparrow	B
darkeyed junco	B
tree sparrow	B
chipping sparrow*	B
whitecrowned sparrow	B
goldencrowned sparrow*	M
fox sparrow	B
Lincoln's sparrow	B
lapland longspur	M
snow bunting	M
 HYPOTHETICAL LIST	
greater yellowlegs	M
buffbreasted sandpiper	M

Table 4. Annotated list of mammals occurring on the Creamer's Field Migratory Waterfowl Refuge (Spindler 1976).

The following classifications are used:

C = common
O = occasional
R = rare

INSECTIVORA	Soricidae	
	arctic shrew	C
	masked shrew	C
	pigmy shrew	O
LAGOMORPHA		
	Leporidae	
	snowshoe hare	C
RODENTIA		
	Sciuridae	
	woodchuck	C
	red squirrel	C
	northern flying squirrel	C
	Castoridae	
	beaver	C
	Cricetidae	
	northern redbacked vole	C
	tundra vole	C
	meadow vole	C
	muskrat	C
	northern bog lemming	O
	Muridae	
	meadow jumping mouse	O
	Erethizontidae	
	porcupine	R
CARNIVORA		
	Canidae	
	wolf	R
	red fox	C
	Ursidae	
	black bear	O
	Mustelidae	
	pine marten	C
	least weasel	C
	ermine	C
	mink	O
	Felidae	
	lynx	O
ARTIODACTYLA		
	Cervidae	
	moose	C

HUMAN USE

Existing Uses

The refuge is used by a number of clubs for organized activities. Groups frequently using the area for organized functions include: Arctic Audubon Society, Fairbanks Bird Club, Alaska Dog Musers' Association, Fairbanks Retriever Club, and Tanana Valley Kennel Club. The area is intensively used by the local school system as a site for field trips in environmental education and biology.

The refuge also receives considerable unstructured human use. Such use includes birdwatching, dog mushing, retriever training, dog tracking training, cross-country skiing, hiking, snowmachining, horseback riding, hunting, falconing, and trapping.

Visitors - Spring and Summer

During the peak of waterfowl migration, the entire community turns out to view the birds. During April 20-May 3, 1983, random visitor counts were conducted for a 10-day period between the hours of 8:00 a.m. and 4:30 p.m. Approximately 11,604 people visited the refuge during that period based on those counts.

During the summer, visitors also walk the 2-mile Nature Trail. These visitors can view an assortment of habitats common to interior Alaska and view wildlife associated with these habitats. Visitors from all 50 states and several countries have visited the refuge during the past 7 years. In 1987, 1,949 visitors reported using the Nature Trail. The actual number of visitors and visits is much higher because some people do not register and repeat visitors do not record each visit (Table 5).

Hunting

The refuge is open to hunting subject to general regulations for GMU 20(B). A portion of the field lies within the Fairbanks city limits, where discharge of firearms is prohibited. Hunting occurs for moose, black bear, waterfowl, cranes, grouse, ptarmigan, and hares. Moose can only be hunted with bow and arrow, a rule which applies to the Fairbanks Management Area. In 1986 2 moose were known to be shot; only 1 was recovered. In November 1987, 4 parties were observed hunting on or near the refuge by staff doing an aerial moose survey. Hunting effort and harvests have not been recorded specifically for the refuge.

Trapping

The refuge is open to trapping subject to general regulations for GMU 20. Trapping occurs on a small scale. No data are available on numbers of trappers or harvest.

Education

Every spring during waterfowl migration all the 5th graders in the Fairbanks school district come to view the birds. Members of the Fairbanks Bird Club, the Arctic Audubon Society, and ADF&G staff act

Table 5. Nature Trail visitors, 1981-87.

Totals Visitors	Year	States Represented	Countries Represented
1,033	1981	42	20
1,171	1982	41	14
1,727	1983	49	12
1,379	1984	44	11
639	1985	37	7
1,106	1986	44	10
1,946	1987	44	13

as bird identifiers during this period. Teachers are provided with a Creamer's Field Education Packet which provides background material about bird identification and behavior.

ACCESS

There are 24 refuge access points (Appendix 1). The increased popularity of ATV's has become a potentially serious problem with respect to habitat damage and disturbance to wildlife or other users. No systematic regulation has been implemented to control ATV use up to the present time.

INFORMATION NEEDS

Information needs relate to the purposes of the refuge. According to Title 16.20 039(C) Creamer's Field Migratory Waterfowl Refuge was established to provide the following: (1) protection and enhancement of habitat for migratory birds with special emphasis on waterfowl; (2) opportunity to view, photograph, and study various species of plants, wildlife, and geological features typical to interior Alaska.

Other uses allowed on the refuge should be compatible with these purposes. Refuge management should be reviewed in the context of public desires, community growth and development, nearby land uses, hunting and trapping regulations, and wildlife population dynamics. The refuge management regime may change significantly as a result of this review. The following is a list of information needs.

Waterfowl

- Surveys are needed in mid-May, mid-July, and late August of waterfowl numbers, brood counts, and habitat use patterns on old refuge lakes and ponds, and on the new DU ponds to assess the significance of refuge habitats to waterfowl.

Sandhill Cranes

- Surveys are needed of crane numbers and habitat use patterns. This will enable the refuge staff to evaluate the importance and success of the changes in refuge field management that are planned to attract and hold cranes on the refuge. Changes in crane numbers and behavior will be documented following completion in 1989 of a new pond designed to attract cranes.

Furbearers

- Furbearer populations and harvest patterns should be monitored. This will enable refuge staff to assess furbearer resources in relation to refuge purposes.

Moose

- The area around the refuge has experienced rapid human population growth. Continued growth may in time disrupt traditional moose movements to and from the refuge. To accommodate moose movements, the following must be learned: (a) moose population identity; (b) seasonal movement patterns; and (c) home ranges of

moose using the refuge. Creamer's provides visitors an opportunity to see moose, therefore, some effort should be made to ensure that the refuge remains accessible to moose.

Nongame Species

- The relative abundance and habitat use patterns of nongame species should be documented.

Human Use--In order to assess the extent and importance of Creamer's, the following uses should be assessed:

- Determine numbers of spring waterfowl viewers.
- Determine numbers of Nature Trail users.
- Determine numbers of small game, waterfowl, and moose hunters and harvests.
- Determine numbers of trappers and harvests.
- Determine numbers of other users of Creamer's Refuge.

Appendix 1.

Access

Major access points to the refuge described below are noted on the refuge base map by corresponding numbers.

1. The waysides on College Road and Creamer's Lane receive the most intensive use. The Bicentennial Nature Trail starts at the College Road wayside.
2. The terminus of Margaret Street north of Joy School is where numerous hikers, snowmobilers, and ATV users enter. It is used intensively; and with the apartment buildings nearby, use of that route will increase whether uses are appropriate or inappropriate.
3. A narrow, unpaved road enters the refuge from the south. It is popular among "dirt-bikers" in the Lemeta area.
4. Snowmobilers and ATV users especially use the Golden Valley Electric Association power line running across the refuge's southeast corner. From the power line they can enter the dog mushing trail system. Hunters and hikers use it to a lesser extent.
5. The power line is also accessible from Farmers Loop both directly at its intersection and from a dirt road serving private residences. The power line, in general, is where the Dog Musers' Association has had problems with unauthorized snowmobilers entering the musher trails during races.
6. A trail running due south from a private residence enters the dog musher trail system outside the refuge boundary.
7. A trail running due south from Echo Acres Road enters the dog musher trail system outside the refuge boundary.
8. A maze of old tractor trails intersecting the dog musher trail system enters the refuge at several points. These are used mostly by snowmobilers, ATV users, hikers, and hunters who know the area well.
9. "Dog Musher Fields" is an important winter and summer access area. The outgoing musher trail leaves Crossman Road at the edge of the fields and proceeds south providing numerous indirect access points to the refuge.
10. The inbound musher trail ("home stretch") proceeds along a section line and is widely used by Farmers Loop residents for access.

Appendix 1 (cont'd).

11. The Candamar Subdivision has the potential of becoming a major entry point to the dog musher trail system and the refuge. As development along Farmers Loop continues, this route can only become more important.
 12. A 6-meter-wide (20 feet) public access easement is plotted on the Fairbanks North Star Borough zoning maps as a southward extension of Shuros Drive.
 - 13-15. Driveways running south from Farmers Loop to private residences cross or otherwise provide access to the dog musher trail system.
 16. The only point where refuge land adjoins a public highway, other than College Road, is for a very short distance on the northern portion of Farmers Loop. An impressively large stand of white spruce on the refuge along this road is hence preserved from development and a network of walking trails exists through it. Area children find this a convenient location for their treehouses, forts, etc.
 17. Snowmobilers enter the dog mushing trail system at the golf course and KFAR transmitter. If this occurs during dogsled racing, conflicts can occur.
 - 18-19. Old tractor trails are popular with hikers, and especially snowmobilers and ATV users near the western portion of Farmers Loop. These are also entry points to the dog mushing trail system.
 20. An unpaved road proceeding north from College Road serves University of Alaska warehouses and geophysical equipment. The road terminates at an old tractor trail providing access to the musher trails.
 21. A tractor trail proceeds north from the former Beaver Sports Shop and the College Road Peat excavations to the dog musher trails. It is an important snowmobiler and ATV user entry point.
 22. A tractor trail proceeds north from Aurora Motel to the musher trail system, and is a major snowmobiler route.
 23. The Tanana Valley State Fairgrounds is an important access area at all times of the year. It is popular with ATV users who then drive into the refuge via the musher trails.
 24. The road going to the former archery area now located on refuge land receives intense use by mushers, snowmobilers, ATV users, and horses.
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