

2002 BIRD OFF-ROAD POINT COUNT SURVEYS

Gates of the Arctic National Park and Preserve

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INTRODUCTION

Many of the avian species found in Gates of the Arctic National Park and Preserve are neotropical migrants, wintering in the southern United States, the tropics, and South America. Several species, such as the Bluethroat and Northern wheatear, migrate to Asia and North Africa. Migrating birds are facing widespread loss of habitat in critical feeding and staging areas along migration routes and in wintering areas. Pesticides and herbicides constitute additional threats to migrating birds, particularly those wintering in third world countries. Impacts of these threats on neotropical migrant bird populations may be detected first through changes in bird abundance, distribution, and reproductive success on the breeding grounds.

In 1993, Boreal Partners in Flight coordinated a program using off-road point counts to monitor bird species abundance in Alaska. As part of this program, resource management staff established 3 off-road point count routes within the park; three new routes have been added since 1993, resulting in 2 routes in each survey area. Goals for this project are to:

1. Contribute to regional effort to monitor statewide population trends and habitat use.
2. Identify resident or breeding bird species in 3 distinct areas of the park;
3. Collect baseline information on bird species abundance in these 3 areas; and
4. Obtain habitat use information for bird species in these areas.

The 2002 off-road point count bird survey is the ninth year of this long-term monitoring project.

STUDY AREA

Gates of the Arctic National Park and Preserve is located above the Arctic Circle (66° 33' N latitude) in the central Brooks Range, Alaska. Two climate zones occur in the park and preserve: the subarctic zone at lower elevations south of the continental divide and the arctic zone to the north and at high elevations. Precipitation is low within the park and preserve and yearly averages fall between 30 - 45 cm in the west and 13 - 25 cm in the north (National Park Service 1986). Snowfall south of the divide ranges between 152 - 203 cm, and between 89 - 127 cm north of the divide. Yearly temperatures in the south fluctuate from an average July maximum of 21° C (70° F) to an average January minimum of -34° C (-30° F). Temperatures in the north fluctuate from an average July maximum of 18° C (65° F) to an average February minimum of -23° C (-10° F).

Three off-road point count survey areas were established in 1993: Middle Fork of the Koyukuk River, Pingo Lake on the Noatak River, and Anaktuvuk Pass (Figures 1-3). The Middle Fork of the Koyukuk routes are in boreal forest, tundra, and

shrub thicket vegetation communities, which are common community types in the park and preserve (Figure 2) (National Park Service 1986). Boreal forest covers the southern flanks and valleys of the Brooks Range and is composed of black spruce (*Picea mariana*), white spruce (*P. glauca*), paper birch (*Betula papyrifera*), aspen (*Populus tremuloides*), and balsam poplar (*Populus balsamifera*). Tall dense willow (*Salix* spp.)/alder (*Alnus* spp.) thickets up to 3.5 m in height occur along stream channels and gravel bars.

The Anaktuvuk Pass and Pingo Lake off-road point count transects (Figures 1 and 3) are located within moist tundra, which is the predominant vegetation community on the north side of the Brooks Range. It is composed primarily of cotton sedge (*Eriophorum* spp.) and forms on moderate to poorly drained soils. Willow thickets line stream channels and low-lying areas in the northern and western tundra areas.

METHODS

Off-road point count transects consisting of 12 points each were established in 1993, 2000, and 2001 in three areas of the park and preserve: the Middle Fork Koyukuk River, Pingo Lake on the Noatak River, and Anaktuvuk Pass (Figures 1-3). Point count sites along each transect were separated by >200 m in treed habitat and >400 m on tundra and along the river. The Middle Fork Koyukuk River transect was completed by canoe but all other routes were traversed on foot. Surveys were conducted 11 – 19 June 2002, starting at 0245 h and finishing by 0815 h.

Three survey techniques were employed in 2002. One method required that all birds were identified by song or sight during an 8-minute interval at each point, and were estimated to be within or beyond a 50-m radius of the point (The Alaska Chapter of Boreal Partners in Flight; modified from Ralph et al. 1993). The Variable Circular Plot (VCP) Method was also used at each point. This method requires that all birds detected during an 8-minute count period are recorded and the distances from the observer to each bird are estimated. Distances were recorded in 10-m intervals out to 100 m, and in 25-m intervals out to 150 m; birds determined to be greater than 150 m from the observer were given a distance interval designation of >150 m. The third technique required bird detections to be broken into 3 time intervals (0-3, 3-5 and 5-8 minutes) to estimate species detection probabilities (Farnsworth et al. 2002).

Site-specific habitat data and GPS coordinates were collected at each point count site during previous survey years. Habitat data included: elevation, slope, aspect, distance to water, disturbance, tree canopy cover, major tree layer species and heights, major shrub layer species and percent cover, major herb layer species and percent cover, percent cover of moss and lichen species, and site wetness. Sites were classified according to Viereck's Alaska Vegetation Classification (Viereck et al. 1992) or Kessel's Avian Habitat Classification for Alaska (Kessel 1979).

RESULTS AND DISCUSSION

Fifty-seven bird species were detected during the 2002 off-road point count transects (Tables 1 and 2). Of those 57 species, 6 species (common snipe, lesser yellowlegs, white-crowned sparrow, Savannah sparrow, common raven, and common redpoll) were detected in all 3 survey areas. Species composition was comparable between the Anaktuvuk Pass and Pingo Lake transects where 13 species of the 20 and 30 species (respectively) identified were detected in both areas. Species detected on the Middle Fork Koyukuk transects (30 species) were different from those detected on the Anaktuvuk and Pingo Lake survey areas. Species that were unique to Middle Fork Koyukuk were those that are typically found in boreal forest and riparian systems (e.g. Canada goose, spotted sandpiper, solitary sandpiper, olive-sided flycatcher, bank swallow, gray jay, boreal chickadee, ruby-crowned kinglet, Swainson's thrush, varied thrush, yellow warbler, myrtle warbler, northern waterthrush), while those unique to Anaktuvuk Pass or Pingo Lake are more typically detected in mountain and lake system habitats (e.g. red-throated loon, long-tailed jaeger, golden eagle, upland sandpiper, least sandpiper, American golden plover, Lapland longspur, horned lark, and rosy finch).

Middle Fork Koyukuk Routes

Species composition was similar between the river route (MFK#1) and overland route (MFK#2) on the Middle Fork of the Koyukuk (Table 1). This is different from 2001 findings, where the river route was considerably more diverse than the overland route. Nineteen species were detected on the river route in 2002 (Table 1), which is 8 fewer than detected in 2001. Species detected in 2001 that were not detected in 2002 within the Middle Fork Koyukuk vicinity (during and between surveys) were the American kestrel, violet-green swallow, American tree sparrow, and Lincoln's sparrow; Bohemian waxwings were detected in 2002 and not in 2001.

The most abundant species on the river and overland routes were the Myrtle warbler, Swainson's thrush, dark-eyed junco and white-crowned sparrow. Wilson's warblers were abundant on the river route, and they were detected at the first point of the overland route, which is located on the river. Species detected on the overland route that were not detected on the river route are those typically found in black spruce dominated forests or open lowland tussocks (boreal chickadee, gray jay, Savannah sparrow, and common redpoll). As expected, species detected on the river route that were not detected on the overland route are those typically found in riparian corridors of tall shrubs and mixed deciduous/coniferous forests (Canada goose, lesser yellowlegs, yellow warbler, northern waterthrush, and fox sparrow).

Pingo Lake Routes

Only 11 bird species were detected on the mountain route in the Pingo lake vicinity (PIN#2, Table 1). The mountain route began at 700 m (2300 ft) in low shrub habitat where the orange-crowned warbler, American Robin, white-crowned sparrow and Savannah sparrow were detected (points 1-3). The route quickly gained elevation (1200 m (3900 ft) at point 4), and the habitat shifted into dwarf shrub mountain tundra where American pipits, horned larks, and northern wheatears were common. The route followed a ridge where the number of species detected decreased. Horned larks were the only species detected at points 7 and 8, which was similar to the 2001 survey. However, the number of horned larks at these points was considerably lower in 2002 than in 2001, which was likely due to noise interference caused by higher wind. Species that prefer low shrub habitat were detected at the end of the route where it dipped down into a willow drainage, including American robins, golden-crowned sparrows, Wilson's warblers and American tree sparrows.

Sixteen species were identified on the floodplain route in the Pingo Lake vicinity (PIN#1, Table 1). More species were detected on this route because habitat was more diverse due to patches of tall shrubs, creek drainages, ponds, and open grass/sedge areas. The most common species detected on this route were the American tree sparrow, white-crowned sparrow, and common redpoll. Other common species included the gray-cheeked thrush, American Robin, lesser yellowlegs, orange-crowned warbler and upland sandpiper. A Say's phoebe and immature golden eagle were also detected during the survey on a south facing bluff west of Otkurak Creek.

Anaktuvuk Pass Routes

Twenty bird species were detected on the Anaktuvuk floodplain route (AKP#1) in 2002 (Table 1). This was similar to the 21 species that were detected in 2001, which was the highest number of species ever detected on this route. The most abundant species on this route were the American tree sparrow, Savannah sparrow, white-crowned sparrow, Lapland longspur and common redpoll. A red-throated loon was also detected on this route for the first time at point 12. Smith's longspurs were noted as more abundant in 2001 relative to previous years; similar numbers (4) were detected on this route in 2002. Rock ptarmigan were identified on the floodplain route for the first time in 2001; however, none were observed in 2002.

Nine species were identified on the mountain route that ran up the Contact Creek valley and into an unnamed side drainage valley (AKP#3; Table 1; established in 2001 by S. Swanson and D. DiFolco). The American tree sparrow, Savannah sparrow, white-crowned sparrow and common redpoll were the most frequently detected species on this route in 2002. The majority of the birds detected on this route were along Contact Creek, which is approximately 0.5 km from most points; this approaches the limits for positive identification by song. Seventy-seven % of all detections were estimated at distances greater than 150 m. Moving the route closer to the creek would likely increase the number of species and birds detected, and decrease distance estimates.

RECOMMENDATIONS

1. Beginning the surveys on 11 June seemed to be fine for bird detection. Birds seemed to be established on territories and were often nesting by then. Before completing routes check on water levels on the Middle Fork Koyukuk River, ice on Pingo Lake, and snow in Anaktuvuk Pass before determining survey dates and order.
2. Continue running both routes at each study site. Different groups of birds are being detected on each route and species diversity in the area will be best represented.
3. For best results in relocating points, load lat/long coordinates into the GPS and navigate to the points while running the survey.
4. Use distance estimation procedures to conduct the surveys. More information will be obtained to track trends in the future when Boreal Partners in Flight finally looks at the data.
5. Use a rangefinder to calibrate distances, particularly on tundra. It is very difficult to estimate distances in open terrain and lining up bushes or rocks of known distances improves the accuracy of the estimates. Range finders were not used in 2002, though they were used in 2001.
6. Move the Anaktuvuk Pass mountain route (AKP#3) closer to the creek to increase the number of species and birds detected, and decrease distance estimates. Creek noise may interfere with bird detections, however it will probably not interfere more than with the current route. Creek noise may actually be amplified due to the location of the current route on the hillside, therefore, moving the route down the hill and closer to the creek may decrease noise interference.
7. Move points 7, 8, 9 and 10 of the Pingo Lake mountain route (PIN#2) off of the ridgeline to the east or west, remaining in similar horned lark habitat. This may reduce wind interference but still allow for detection of similar species.

LITERATURE CITED

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Table 1. Number of birds/species detected during GAAR off-road point count surveys, June 11 – 19, 2002. List includes species detected during count times and between points during surveys conducted in the Anaktuvuk Pass (AKP), Middle Fork of Koyukuk (MFK), and Pingo Lake/Noatak (PIN) vicinities.

Species	AKP #1	AKP #3	MFK #1	MFK #2	PIN #1	PIN #2	Grand Total
Red-throated Loon	1						1
Canada Goose			1				1
Greater Scaup	1						1
Red-breasted Merganser	4						4
Golden Eagle					1		1
Peregrine Falcon				1			1
American Golden-plover	4						4
Lesser Yellowlegs	1	2	1		10		14
Spotted Sandpiper			4				4
Upland Sandpiper					8		8
Least Sandpiper					3		3
Common Snipe	2			2	2		6
Long-tailed Jaeger	2						2
Olive-sided Flycatcher			4	2			6
Hammond's Flycatcher			1	3			4
Say's Phoebe					1		1
Horned Lark						5	5
Bank Swallow			2	2			4
Gray Jay	1			8			9
Common Raven					1		1
Boreal Chickadee				1			1
Ruby-crowned Kinglet			3	3			6
Northern Wheatear	2					2	4
Gray-cheeked Thrush			4	7	10		21
Swainson's Thrush			30	14			44
American Robin		2			8	4	14
Varied Thrush			5	1			6
American Pipit	3	1				6	10
Bohemian Waxwing			1				1
Orange-crowned Warbler					9	2	11
Yellow Warbler			4				4
Myrtle Warbler			11	23			34
Norther Waterthrush			1				1
Wilson's Warbler			17	1		1	19
American Tree Sparrow	10	12			31	2	55
Savannah Sparrow	17	6		1	6	3	33
Fox Sparrow			5				5
Golden-crowned Sparrow		3				2	5
White-crowned Sparrow	12	6	7	11	27	4	67
Dark-eyed Junco			9	16	1		26
Lapland Longspurs	7						7
Smiths Longspurs	4				1		5
Rosy Finch		1					1
White-winged Crossbill			1	1			2
Common Redpoll	12	13		11	24	7	67
Grand Total	83	48	111	108	143	39	532

Table 2. Species observed within survey route vicinities that were not detected during the survey period.

SPECIES	Anaktuvuk Pass	Middle Fork	Pingo Lake
Glaucous Gull	x		
Red-tailed Hawk		x	
Common Merganser		x	
Solitary Sandpiper		x	
Long-tailed Duck			x
Red-necked Phalarope			x
Horned Grebe			x
Merlin			x
White-winged Scoter			x
Ring-necked Duck			x
Scaup sp.			x
American Wigeon			x
Mew Gull			x
Arctic Tern			x

Anaktuvuk Pass Off-road Point Count Routes

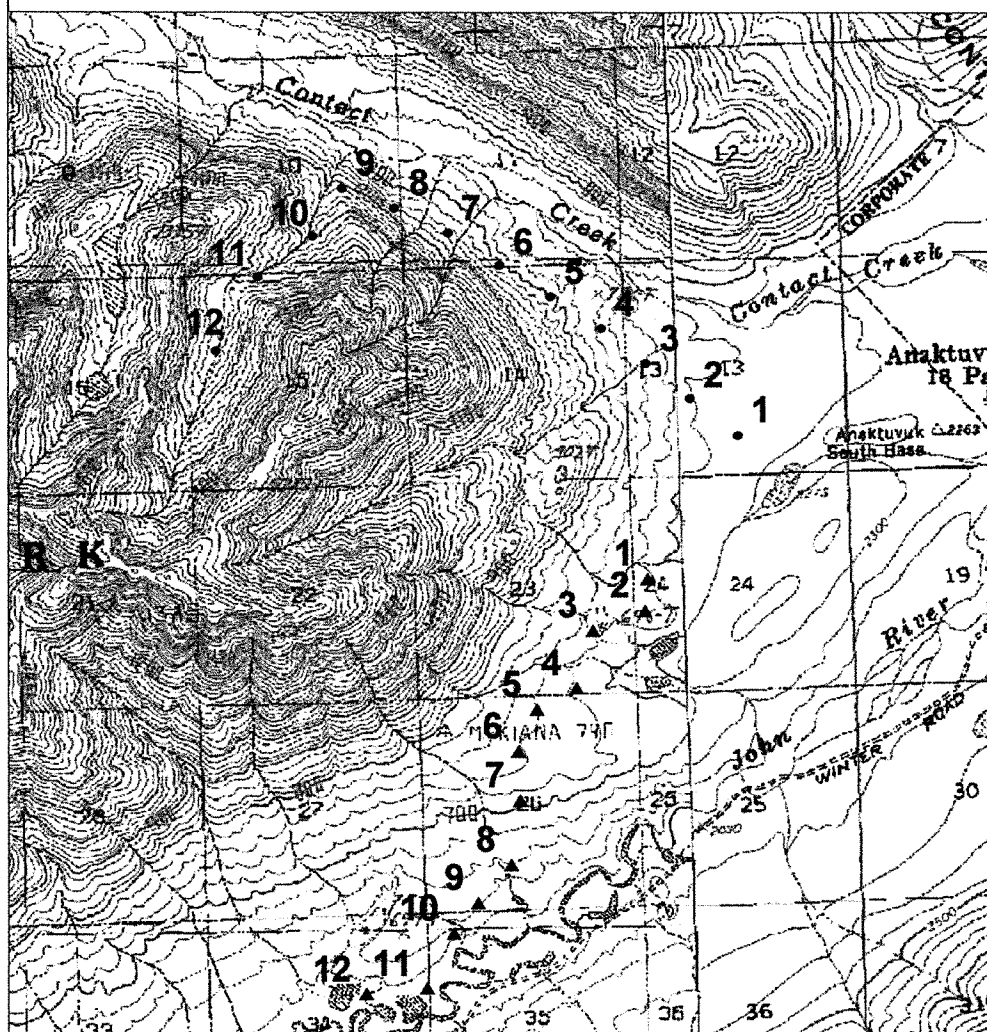


Figure 1. Location of bird off-road point count routes AKP1 (Valley) and AKP3 (Mountain) near Anaktuvuk Pass, Gates of the Arctic National Park and Preserve, AK, June 15-16, 2002.

▲ AKP1 ● AKP3

Map Location



National Park Service
Gates of the Arctic National Park and Preserve
Biological Resources

0.5 0 0.5 1 Kilometers

1:39,370 1 inch = 1.00 kilometers



Plot date: July 30, 2001 p:\ga\ar\naturalresources\birds\orpc\newproject\data\2000\orpc.apr

Middle Fork Koyukuk Off-road Point Count

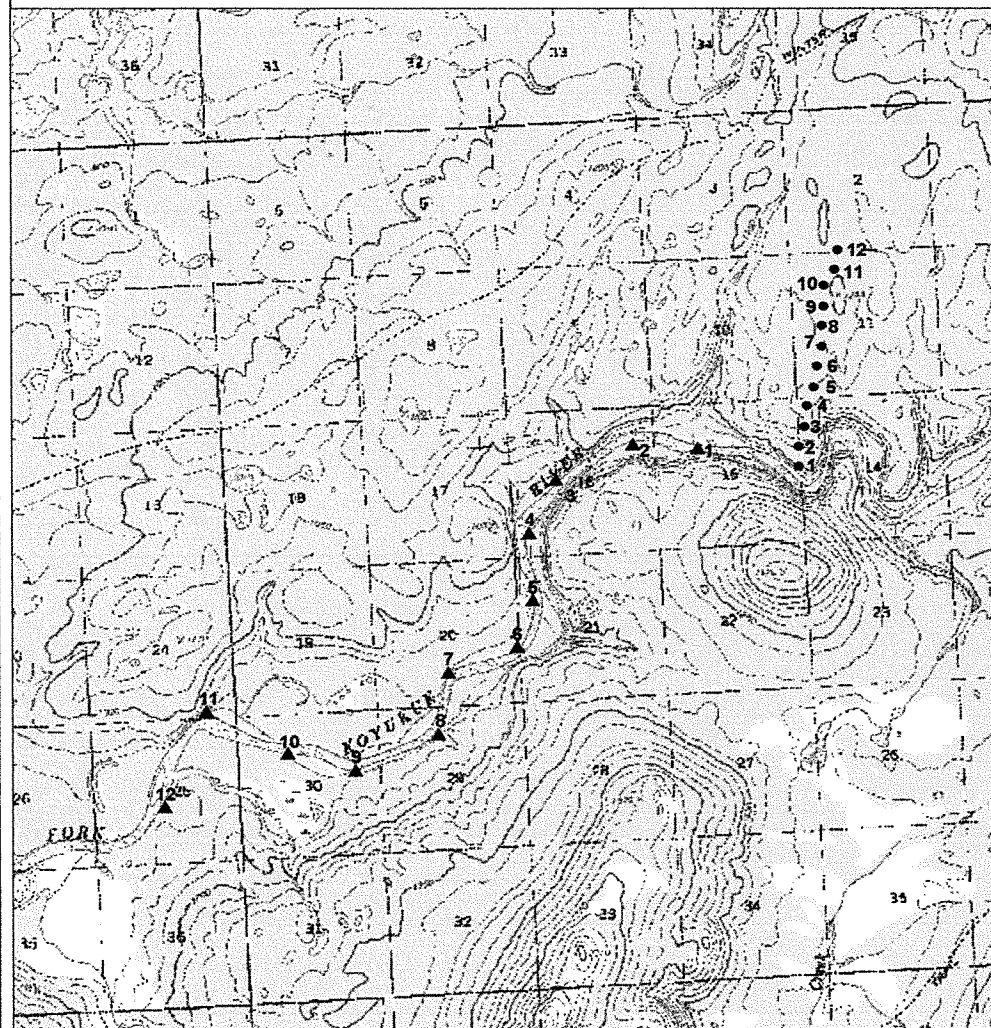


Figure 2. Location of bird off-road point count routes MFK1 (river) and MFK2 (land) on the Middle Fork Koyukuk River, Gates of the Arctic National Park and Preserve, AK, June 11-12, 2002.

▲ MFK1

● MFK2

Map Location



National Park Service
Gates of the Arctic National Park and Preserve
Biological Resources

0.5 0 0.5 1 1.5 Kilometers

1 : 58,055 1 inch = 1.50 kilometers



Plot date: July 31, 2001 p:\ga\ar\naturalresources\birds\orpc\newproject\data\2001 orpc.apr

Pingo Lake Off-road Point Count Routes

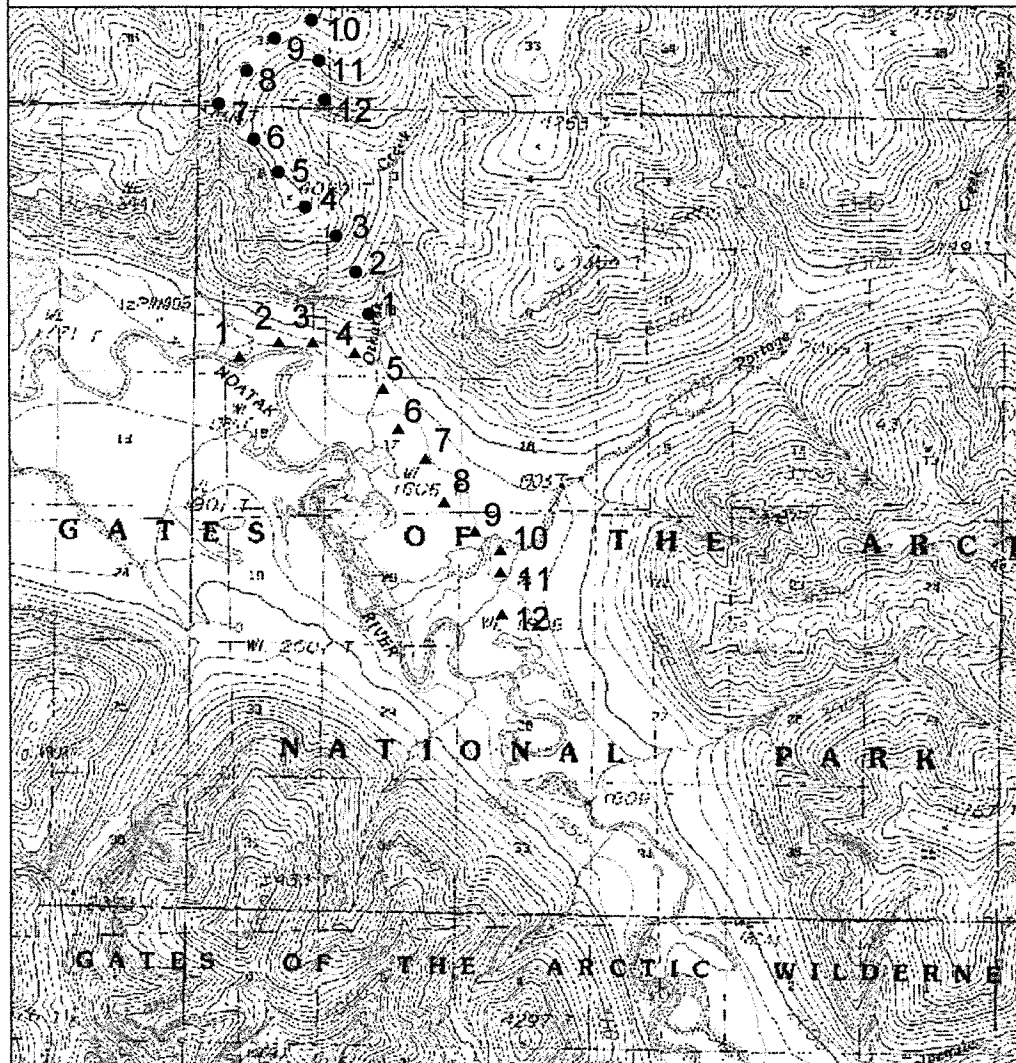


Figure 3. Location of bird off-road point count routes PINO1 (Floodplain) and PINO2 (Mountain) near Pingo Lake, Gates of the Arctic National Park and Preserve, AK, June 18-19, 2002.

▲ PINO1

● PINO2

Map Location



National Park Service
Gates of the Arctic National Park and Preserve
Biological Resources

0.5 0 0.5 1 1.5 Kilometers



Plot date: July 31, 2001 p:\gaar\naturalresources\birds\orpc\newproject\data\2001\orpc.apr