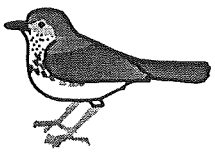
2001 BIRD OFF-ROAD POINT COUNT SURVEYS

Gates of the Arctic National Park and Preserve



GAAR-01-02
July 31, 2001

Shelli A. Swanson. National Park Service. 201 First Ave, Fairbanks, AK 99701

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 3-year pilot 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. Identify resident or breeding bird species in 3 distinct areas of the park;

2. Collect baseline information on bird species abundance in these 3 areas; and

3. Obtain habitat use information for bird species in these areas.

The 2001 off-road point count bird survey is the eighth year of this long-term monitoring project.

Many thanks to Donna DiFolco for her invaluable survey assistance and camaraderie on this 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 (Figs. 1-3). 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 averages south of the divide range between 152 - 203 cm and averages of 89 - 127 cm are typical in the north. 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).

Boreal forest, tundra, and shrub thicket are the major vegetation communities in the park and preserve (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 Middle Fork Koyukuk off-road point count transects (Fig. 2) are located within this plant community.

Moist tundra 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. Low willow thickets line stream channels and low-lying areas in the northern tundra areas, but willow thickets up to 3 m in height occur along stream channels in the western tundra areas. The Anaktuvuk Pass and Pingo Lake off-road point count transects (Figs. 1 and 3) are located within this vegetation community.

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 (Figs. 1-3; Table 1). Point count sites within 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 9-16 June 2001, starting at 0300h and finishing by 0830 h. In 2001 two survey techniques were employed. In one, all birds identified by song or sight during a 5-minute interval at each point were identified and mapped according to their location and distance (in or out of 50m) from the point. The Alaska Chapter of Boreal Partners in Flight modified this methodology from Ralph et al. (1993). The second technique involved estimating distances to each bird (the Variable Circular Plot Method). At each point on a transect, all birds detected during an 8-minute count period (recorded as 2 time intervals, the first 5 and last 3 minutes of the count period) were recorded along with the distance interval from the observer to the bird. Distances were recorded in 10 meter intervals out to 100 meters and then in 25 meter intervals out to 150 meters; birds determined to be greater than 150 meters from the observer were given a distance interval designation of >150 m. A range finder was used to calibrate distance estimations in open areas.

Site-specific habitat data and GPS coordinates will be collected at each point count site during the inventory. Habitat data will include: 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. Habitat data will allow site classification according to Viereck's Alaska Vegetation Classification Viereck et al. 1992) or Kessel's Avian Habitat Classification for Alaska (Kessel 1979).

RESULTS AND DISCUSSION

Sixty-two bird species were detected during the 2001 off-road point count transects (Table 2). Of those 62 species, 7 species (Common snipe, Lesser yellowlegs, White-crowned sparrow, American tree sparrow, Savannah sparrow, Fox sparrow, and Common redpoll) were detected in all 3 survey areas. Species composition was comparable between the Anaktuvuk Pass and Pingo Lake transects where 15 species of the 27 and 28 species (respectively) identified were detected in both areas. Species detected on the Middle Fork Koyukuk transects were quite different from those detected on the Anaktuvuk and Pingo Lake survey areas. Beyond the species common to all three areas, only the Gray-cheeked thrush was found in common between the Pingo Lake and Middle Fork Koyukuk survey areas and there were no additional species found in common between the Middle Fork Koyukuk and Anaktuvuk Pass areas.

The 2001 surveys were run slightly earlier than usual. The Middle Fork Koyukuk River was still in flood stage, Pingo lake had melted out hours before we arrived and Anaktuvuk Pass still had 4 inches of snow on the ground the week before we surveyed there. However, it appeared that bird detection rates were high and species that were expected to occur on these transects were detected, which has not always been the case in past years.

Middle Fork Koyukuk Routes

The river route was by far the most diverse from a species standpoint. Twenty-seven species were detected on the river route, which is the highest number of species ever detected on this route. In contrast, only 17 were identified on the overland route established this year. However, 3 species were detected on the overland route that were not identified on the river route: Boreal chickadee, Common snipe, and American tree sparrow. Boreal chickadees have been detected on the river route in past years. We were not able to get a significant elevation change on the overland route (the entire region is fairly low and flat) so species detection was not as high or diverse as we had anticipated. Habitat diversity was much higher along the river, supporting a wider variety of species. Most of the points (7/12 points) on the overland route were in needleleaf woodland vegetation, which is not know for being overly rich in bird life.

Pingo Lake Routes

Only 10 bird species were detected on the mountain route (established in 2000 by Michael Swaim) in the Pingo lake vicinity, but bird species that had never been detected on the floodplain route were identified. These species included American pipits, Horned larks, and Golden-crowned sparrows. The mountain route involves a ridge walk that traverses prime Horned lark habitat; 8 Horned larks were detected during the 8-minute point count periods at both points 7 and 8 on the route. Golden-crowned sparrows were numerous at the last 2 points on the route where it dips down into a willow drainage area. American pipits were encountered starting at 3500' elevation and were often engaged in aerial flight displays.

In comparison to the mountain route, the floodplain route contained more species of waterfowl, shorebirds, raptors, and tall shrub/dwarf tree bird species such as the American Robin, Fox sparrow, and Gray-cheeked thrush. However, primarily sparrow species were surveyed on this route. Eighteen species were identified in 2001, which ties with the highest number of species detected on the route since 1993. Habitat is more diverse on this route because of creek drainages, ponds, and open grass/sedge areas. In 2001, fewer individual birds (though not species) than usual appeared to be detected on the floodplain route, particularly along the creek corridors. Temperatures ranged from 26° F to 36° F during this survey, which may be in part responsible for this perceived decline in singing individuals. A dead Arctic fox was found on this route—a new mammal species sighting for the area.

Anaktuvuk Pass Routes

Twenty-one bird species were detected on the Anaktuvuk floodplain route; this is the highest number of species ever detected on this route. Fourteen species were identified on the newly established mountain route that ran up the Contact Creek valley and into an unnamed side drainage valley. The Anaktuvuk Pass mountain route set up in 2000 by Michael Swaim was judged to be too noisy when run in 2000 and it was recommended that we not use it for long-term monitoring. Water noise from Contact Creek and a side creek we followed also was problematic for the last half of the new route established in 2001. Species of note from the higher elevation route were the Townsend's solitaire, Golden-crowned sparrow, Rosy finch, and Wandering tattler; these species have never been detected on the lower floodplain route.

Smith's longspurs seemed more abundant than usual in 2001, with 4 individuals being detected in the last 3 points of the floodplain route. Rock ptarmigan were identified on this route for the first time. Several nests were observed while running the surveys and on the return to camp. Of note were a Least sandpiper nest along the ATV trail, several Lapland longspur nests, and several American tree sparrow nests. Late snow year or not, the birds stayed right on schedule.

RECOMMENDATIONS

1. Beginning the surveys around the June 8 seems to be fine for bird detection. Birds seemed to be established on territories and were often nesting by then. Need to 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 will give a clearer picture of the species diversity in the area.
3. For best results in relocating points, load lat/long descriptions into the GPS and navigate to the points while running the survey. Points were missed on the Pingo #1 route because habitat is changing slightly and it is hard to judge distances.
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 wide open terrain and lining up bushes or rocks of known distances improves the accuracy of the estimates.
6. Analyze the data comparing the distance estimation method with the standard BPIF protocol. Time was not available in 2001 to examine our dual datasets because we are trying to finish up the YUCH Bird Inventory Project.
7. Develop a project to complete repeated runs of the same route to look at daily detection variability.

LITERATURE CITED

Kessel, B. 1979. Avian habitat classification for Alaska. The Murrelet 60:86-94.

National Park Service. 1986. Gates of the Arctic National Park and Preserve, Alaska--general management plan/land protection plan/wilderness suitability review. U.S.D.I., National Park Service, Fairbanks, AK. 299 pp.

Ralph, C.J., G.R. Geupel, P. Pyle, T.E. Martin, and D.F. DeSante. 1993. Handbook of field methods for monitoring landbirds. Gen. Tech. Rep. PSW-GTR-144. U.S.D.A., Forest Service, Pacific Southwest Research Station, Albany, CA. 41 pp.

Viereck, L.A., C.T. Dyrness, A.R. Batten, and K.J. Wenzlick. 1992. The Alaska vegetation classification. Gen. Tech. Rep. PNW-GTR-286. U.S.D.A. Forest Service, Pacific Northwest Research Station, Portland, OR. 278 pp.

Table 1. Locations for points on bird off-road point count transects in Gates of the Arctic National Park and Preserve, AK, June 2001. These routes are run annually between June 8 and June 21.

Point Number	Anaktuvuk Pass #1 (Floodplain) (AKP1)	Middle Fork Koyukuk River #1 (River) (MFK1)	Pingo Lake #1 (Floodplain) (PINGO1)
1	68 07.688 N 151 47.940 W	67 04.917 N 150 36.672 W	67 39.729 N 155 21.281 W
2	68 07.658 N 151 48.362 W	67 04.971 N 150 37.678 W	67 39.814 N 155 20.623 W
3	68 07.557 N 151 48.987 W	67 04.771 N 150 38.872 W	67 39.814 N 155 20.039 W
4	68 07.340 N 151 49.216 W	67 04.477 N 150 39.391 W	67 39.714 N 155 19.111 W
5	68 07.257 N 151 49.632 W	67 04.050 N 150 39.343 W	67 39.518 N 155 18.851 W
6	68 07.088 N 151 49.833 W	67 03.772 N 150 39.636 W	67 39.258 N 155 18.598 W
7	68 06.890 N 151 49.841 W	67 03.644 N 150 40.699 W	67 39.069 N 155 18.088 W
8	68 06.782 N 151 49.994 W	67 03.283 N 150 40.882 W	67 38.796 N 155 17.812 W
9	68 06.589 N 151 50.356 W	67 03.092 N 150 42.194 W	67 38.616 N 155 17.255 W
10	68 06.369 N 151 50.470 W	67 03.220 N 150 43.207 W	67 38.510 N 155 16.838 W
11	68 06.187 N 151 50.913 W	67 03.499 N 150 44.357 W	67 38.296 N 155 16.692 W
12	68 06.145 N 151 51.505 W	67 02.940 N 150 45.147 W	67 38.091 N 155 16.484 W
	Anaktuvuk Pass #3 (Mountain) (AKP 3)	**Middle Fork Koyukuk River #2 (Land) (MFK2)**	**Pingo Lake #2 (Mountain) (PINGO2)**
1	68 08.332 N 151 47.394 W	67 04.786 N 150 35.189 W	67 40.004 N 155 19.061 W
2	68 08.482 N 151 47.889 W	67 04.900 N 150 35.158 W	67 40.171 N 155 19.185 W
3	68 08.631 N 151 48.340 W	67 05.020 N 150 35.069 W	67 30.310 N 155 19.415 W
4	68 08.780 N 151 48.812 W	67 05.146 N 150 35.009 W	67 40.414 N 155 20.112 W
5	68 08.916 N 151 49.340 W	67 05.254 N 150 34.886 W	67 40.535 N 155 20.390 W
6	68 09.044 N 151 49.855 W	67 05.376 N 150 34.821 W	67 41.075 N 155 21.038 W
7	68 09.183 N 151 50.403 W	67 05.497 N 150 34.728 W	67 41.208 N 155 21.394 W
8	68 09.291 N 151 50.950 W	67 05.617 N 150 34.716 W	67 41.341 N 155 21.127 W
9	68 09.379 N 151 51.507 W	67 05.735 N 150 34.676 W	67 41.467 N 155 20.457 W
10	68 09.190 N 151 51.835 W	67 05.861 N 150 34.643 W	67 41.543 N 155 20.078 W
11	68 09.033 N 151 52.424 W	67 05.950 N 150 34.463 W	67 41.387 N 155 20.008 W
12	68 08.741 N 151 52.903 W	67 06.067 N 150 34.406 W	67 41.229 N 155 19.542 W

Table 2. Bird species detected during NPS bird surveys, June 9-16, 2001. List includes species detected during the count times and between points during surveys.

Anaktuvuk Pass Vicinity (June 12-13, 2001)	**Pingo Lake Vicinity—Noatak River (June 15-16, 2001)**	**Middle Fork Koyukuk Vicinity (June 9-10, 2001)**
Pacific Loon	Green-winged Teal	Common Merganser
Green-winged Teal	Scaup Spp.	Canada Goose
Red-breasted Merganser	Oldsquaw	Lesser Yellowlegs
Lesser Scaup	Red-Necked Phalarope	Common Snipe
Mew Gull	Mew Gull	Spotted Sandpiper
Long-tailed Jaeger	Arctic Terns	Common Snipe
Least Sandpiper	Upland Sandpiper	Peregrine Falcon
Lesser Yellowlegs	Lesser Yellowlegs	American Kestrel
Wandering Tatler	Common Snipe	Red-tailed Hawk
Rock Ptarmigan	Short-eared Owl	Bank Swallow
Common Snipe	Gyrfalcon	Olive-sided Flycatcher
American Golden Plover	Merlin	Hammond's Flycatcher
American Robin	American Kestrel	Bank Swallow
Northern Wheatear	Northern Harrier	Violet-green Swallow
Townsend's Solitaire	Gray-cheeked Thrush	Swainson's Thrush
American Pipit	American Robin	Varied Thrush
Horned Lark	Northern Wheatear	Gray-cheeked Thrush
Common Raven	American Pipit	Boreal Chickadee
White-crowned Sparrow	Horned Lark	Gray Jay
Golden-crowned Sparrow	Common Raven	Ruby-crowned Kinglet
American Tree Sparrow	Orange-crowned Warbler	Myrtle Warbler
Savannah Sparrow	White-crowned Sparrow	Wilson's Warbler
Fox Sparrow	Golden-crowned Sparrow	Northern Waterthrush
Gray-crowned Rosy Finch	American Tree Sparrow	White-crowned Sparrow
Lapland Longspur	Savannah Sparrow	American Tree Sparrow
Smith's Longspur	Fox Sparrow	Lincoln's Sparrow
Common Redpoll	Smith's Longspur	Savannah Sparrow
	Common Redpoll	Fox Sparrow
		White-winged Crossbill
		Common Redpoll

Anaktuvuk Pass Off-road Point Count Routes

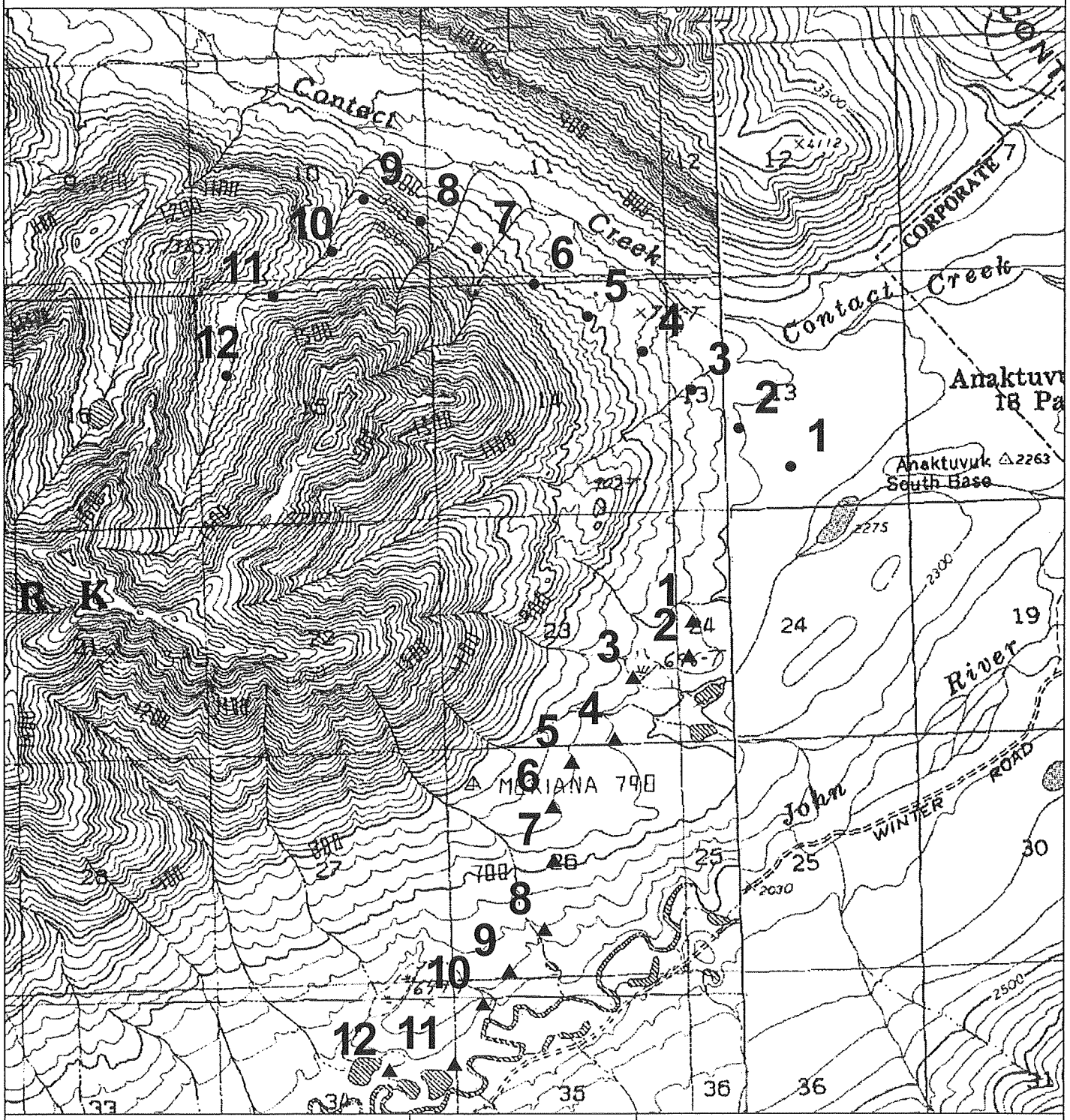
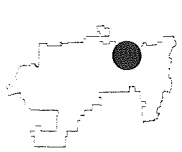


Fig. 1. Location of bird off-road point count routes AKP1 (Valley) and AKP3 (Mountain) near Anaktuvuk Pass, Gates of the Arctic National Park and Preserve, AK, June 12-13, 2001.

▲ 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

N W E S

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

Middle Fork Koyukuk Off-road Point Count

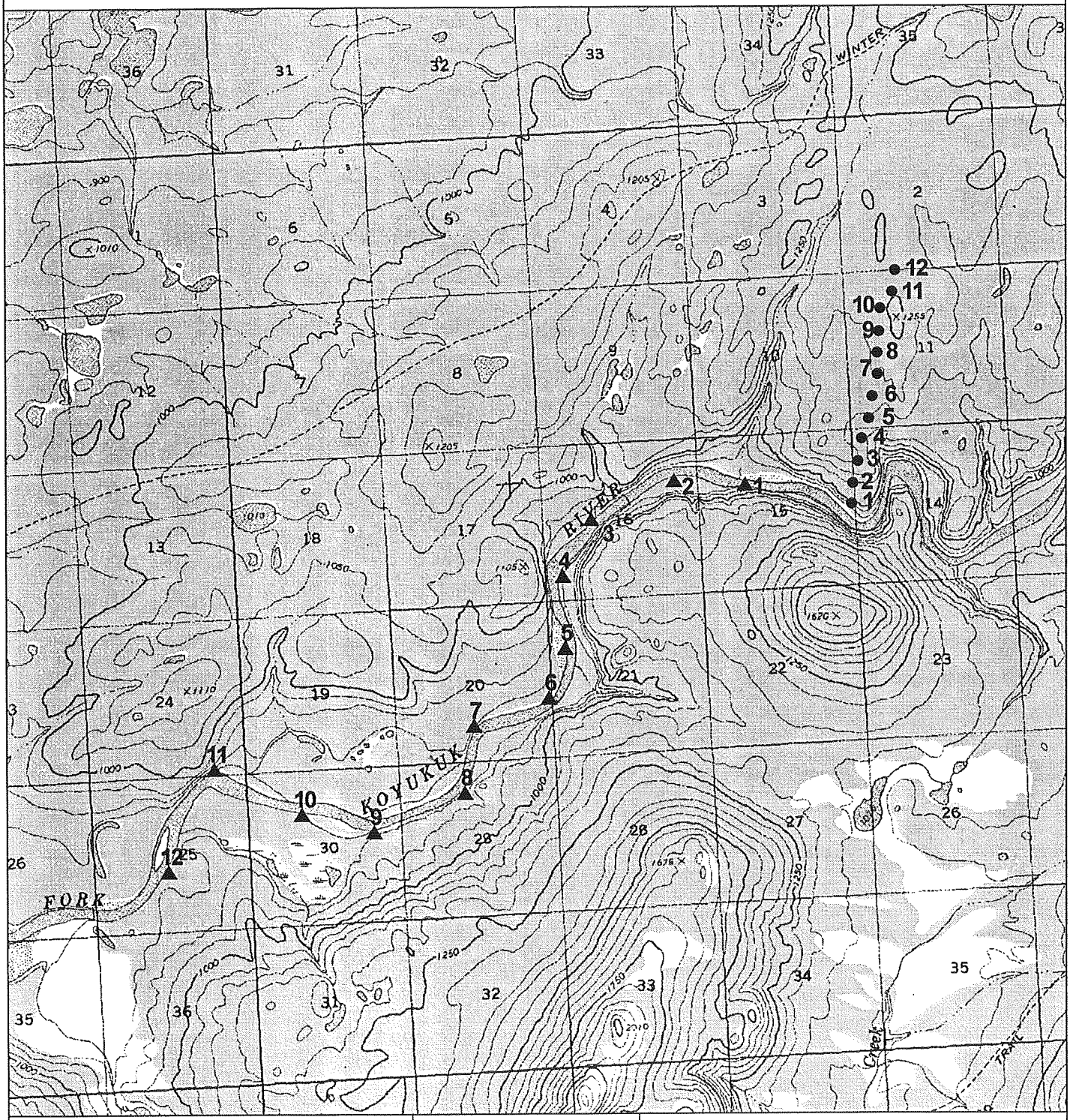
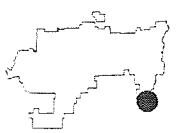


Fig. 2. Location of bird off-road point count routes MFK1 (river) and MFK2 (land)on the Middle Fork Koyukuk River, Gates of the Arctic National Park and Preserve, AK, June 9-10, 2001.

▲ 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 : 59,055 1 inch = 1.50 kilometers

N W E S

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

Gates of the Arctic National Park and Preserve

Pingo Lake Breeding Bird Transect Locations

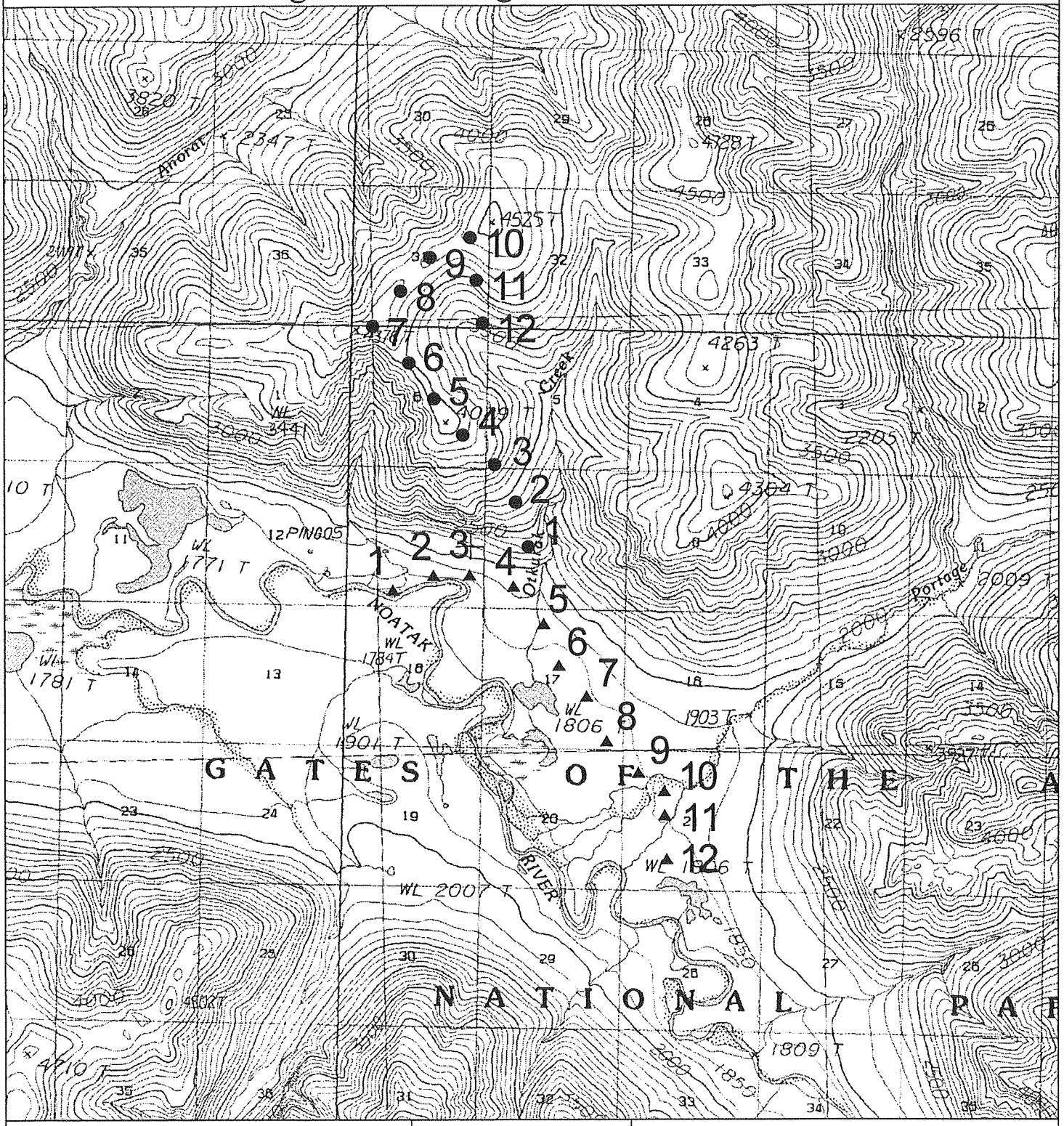


Fig. 3. Location of bird off-road point count routes PINGO1 (Floodplain) and PINGO2 (Mountain) near Pingo Lake, Gates of the Arctic National Park and Preserve, AK, June 15-16, 2001.

▲ PINGO1 ● PINGO2

Map Location

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

0.5 0 0.5 1 1.5 Kilometers

N
W E
S

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