

DALL SHEEP (*Ovis dalli*) SURVEY

DENALI NATIONAL PARK AND PRESERVE

1995 Report

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1995 Dall Sheep, *Ovis dalli*, Survey, Denali National Park and Preserve

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ABSTRACT: Ground-based and aerial trend counts for Dall sheep *Ovis dalli*, were conducted in 1995 during the weeks of 26 June and 10 July. A total of 148 sheep were classified during the ground-based count. 77 ewes, 22 yearlings, and 35 lambs were counted, resulting in 45 lambs/100 ewes and 29 yearlings/100 ewes. The lamb count was down slightly from the 1994 survey period when 56 lambs/100 ewes were observed. The 1995 yearling count is up considerably from the 1994 survey result of 1 yearling/100 ewes and is indicative of the good 1994 lambing rate. Ground-based counts have been conducted along the park road corridor since 1974.

The fourth annual aerial sheep count was conducted over the Outer Range, Upper Savage, Upper Sanctuary, and Upper Teklanika areas. Results indicated a total of 514 sheep counted. Of this total, 320 were unclassified, "ewe-like" animals, 92 were lambs, and 102 were rams.

Aerial counts were conducted in the southwest preserve lands on 10 and 12 July. Areas surveyed included Fourth-of-July Creek and the West Fork of the Yentna River, north to Mystic Pass and west to Shellabarger Pass. Results indicated a total of 371 sheep counted. Of this total, 192 were unclassified, "ewe-like" animals, 72 were lambs, and 107 were rams.

INTRODUCTION

A ground-based composition count of Dall sheep, *Ovis dalli*, was conducted during the week of 26 June in the wilderness area (old park) of Denali National Park. Ground-based counts have been conducted along the park road corridor since 1974 (see park files). These counts have been conducted using similar sampling strategies so results may be compared.

Aerial counts were conducted over portions of the old park and the southwest preserve the week of 26 June and 10 July respectively. Aerial counts have been conducted over old park lands since 1992. Aerial counts have not been conducted over the southwest preserve since 1981, when the National Park Service carried out a helicopter survey in the area. Prior to 1981, Alaska Department of Fish and Game conducted fixed-wing surveys in the same vicinity.

The 1995 survey was funded from park base funds. It was undertaken in order to maintain trend information on sheep composition and abundance within portions of the old park and to establish a base of composition and abundance data within the southwest preserve. This undertaking is consistent with the recommended course of action in the Dall Sheep Management (DENA-N-362.1) project statement in Denali's draft Resources Management Plan.

GROUND-BASED COUNTS

METHODS

The survey area was delineated by Joe Van Horn and Ken Stahlnecker. Boundaries were similar to those used in previous surveys. Daily sheep location flights were flown by pilot Hollis Twitchell and observer Ken Stahlnecker. Ground-based observers were Joe Van Horn, Hilary Maier, Jeff Conn, Karen Fortier, Chuck Tomkiewicz, Ed Vorisek, Rebecca Wilson, and Andy Keller. Two of the eight ground-based observers had previous experience at judging Dall sheep sex and age composition. One day of training in the field was provided for all observers. Survey teams were designated to best utilize the more highly experienced observers.

Weather conditions for the survey consisted of clear skies and calm winds. The positions and estimated composition of lambing groups observed during the location flights were transmitted via radio to the ground crews. Crews, consisting of from two to three individuals, were dispatched to locate the lambing groups. Crews were not dispatched to locate ram groups. Crews approached sheep groups sufficiently close to allow accurate visual sexing and aging of animals with the aid of binoculars and spotting scopes. All sheep seen were classified as ewes, yearlings, lambs, 1/4 curl rams, 1/2 curl rams, 3/4 curl rams, 4/4 curl rams, and unclassified animals. Only

those rams that were part of a lambing group or were encountered while a crew was approaching a lambing group were classified. The objective of this survey technique is to collect composition data only and does not contribute to overall sheep abundance estimates.

The regions of the park included within the ground-based counts were the southern aspect of the Outer Range from Mount Healy west to the Savage River including the western and northern aspect stopping at Ewe Creek, Mount Margaret and Primrose Ridge, Mount Wright, the eastern aspect of Igloo Mountain continuing west to include the southern aspect of Sable Mountain, Cathedral Mountain, the southern and western aspect of Polychrome Mountain, the southern aspect of the mountain lying north of the park road and between the Toklat River and Stony Creek, the northern and western aspect of the mountain lying south of the park road and east of the eastern branch of the Toklat River, Divide Mountain, and the very northern aspect of Gravel Mountain (see Figure 1). These areas were delineated based on the history of sheep use and the reasonable proximity for ground-based access.

RESULTS AND DISCUSSION

Location flights were conducted on 27 and 28 June in a Piper PA-18 aircraft, and totaled 5.4 hours of flight time. Three ground-based survey crews were dispatched on 27 June. One crew each to Cathedral Mountain, Igloo Mountain, and Sable Mountain. Two crews were dispatched on 28 June. One each to the Ewe Creek area and the western aspect of Polychrome Mountain.

A total of 148 sheep were classified. Seventy-seven ewes, 22 yearlings, 35 lambs, 12-1/4 curl rams, and two unclassified animals were counted (see Table 1). The survey resulted in 45 lambs/100 ewes and 29 yearlings/100 ewes. The ewe/lamb ratio was down slightly from the 1994 survey period when 56 lambs/100 ewes were observed. The 1995 yearling count is up considerably from the 1994 survey result of 1 yearling/100 ewes and is indicative of the good 1994 lambing rate. Under more ideal circumstances, the total classified sample size would have been larger. There were approximately 50 animals in the Ewe Creek area which were not classified because they could not be approached closely enough on foot.

AERIAL COUNT - OLD PARK UNIT

METHODS

The survey area was delineated by Ken Stahlnecker and Hollis Twitchell and was similar to that used in previous surveys. Sheep composition flights were flown by pilot Hollis Twitchell and observer Ken Stahlnecker. The pilot and observer had previous experience at judging Dall sheep sex and age composition from fixed-wing aircraft.

Weather conditions for the survey consisted of scattered clouds and moderate winds. Winds continued to increase throughout the course of the survey. The positions and estimated composition of all sheep groups observed were mapped and recorded. All sheep seen were classified as ewe-like, lambs, 1/4 curl rams, 1/2 curl rams, 3/4 curl rams, 4/4 curl rams, and unclassified animals.

The regions of the park included within the old park aerial counts were the Outer Range from Mount Healy west to the Savage River, and the entire upper watersheds of the Savage, Sanctuary, and Teklanika Rivers within the Alaska Range (see Figure 2). These areas were delineated based on the history of sheep use and the reasonable identification of survey area boundaries.

RESULTS AND DISCUSSION

One survey flight was conducted on 29 June in a Piper PA-18 aircraft, and totaled 5.8 hours of flight time. A total of 514 sheep were counted. The total count included 320 "ewe-like" animals, 92 lambs, 12 - 1/4 curl rams, 24 - 1/2 curl rams, 47 - 3/4 curl rams, 10 - 4/4 curl rams, and 9 unclassified rams (see Table 2). Field maps can be found in Appendix A.

The 1994 survey totaled 480 sheep comprised of 292 "ewe-like" animals, 104 lambs, 9 - 1/4 curl rams, 29 - 1/2 curl rams, 21 - 3/4 curl rams, 6 - 4/4 curl rams, and 19 unclassified rams.

AERIAL COUNT - SOUTHWEST PRESERVE UNIT

METHODS

The survey area was delineated by Ken Stahlnecker and Hollis Twitchell. Sheep composition flights were flown by pilot Hollis Twitchell and observer Ken Stahlnecker. The pilot and observer had previous experience at judging Dall sheep sex and age composition from fixed-wing aircraft.

Weather conditions for the survey consisted of broken to overcast cloud cover with calm winds. The positions and estimated composition of all sheep groups observed were mapped and recorded. All sheep seen were classified as "ewe-like", lambs, 1/4 curl rams, 1/2 curl rams, 3/4 curl rams, 4/4 curl rams, and unclassified animals.

The regions of the southwest preserve included within the aerial counts were the mountains to the north of the West Fork of the Yentna River, including Mount Dall, north to Mystic Pass, and west to Shellabarger Pass, and Mountains to the north of the West Fork of the Yentna River including the Fourth-of-July Creek watershed (see Figure 3). These areas were delineated based on known hunter use areas, the history of sheep use, and the reasonable identification of survey area boundaries.

RESULTS AND DISCUSSION

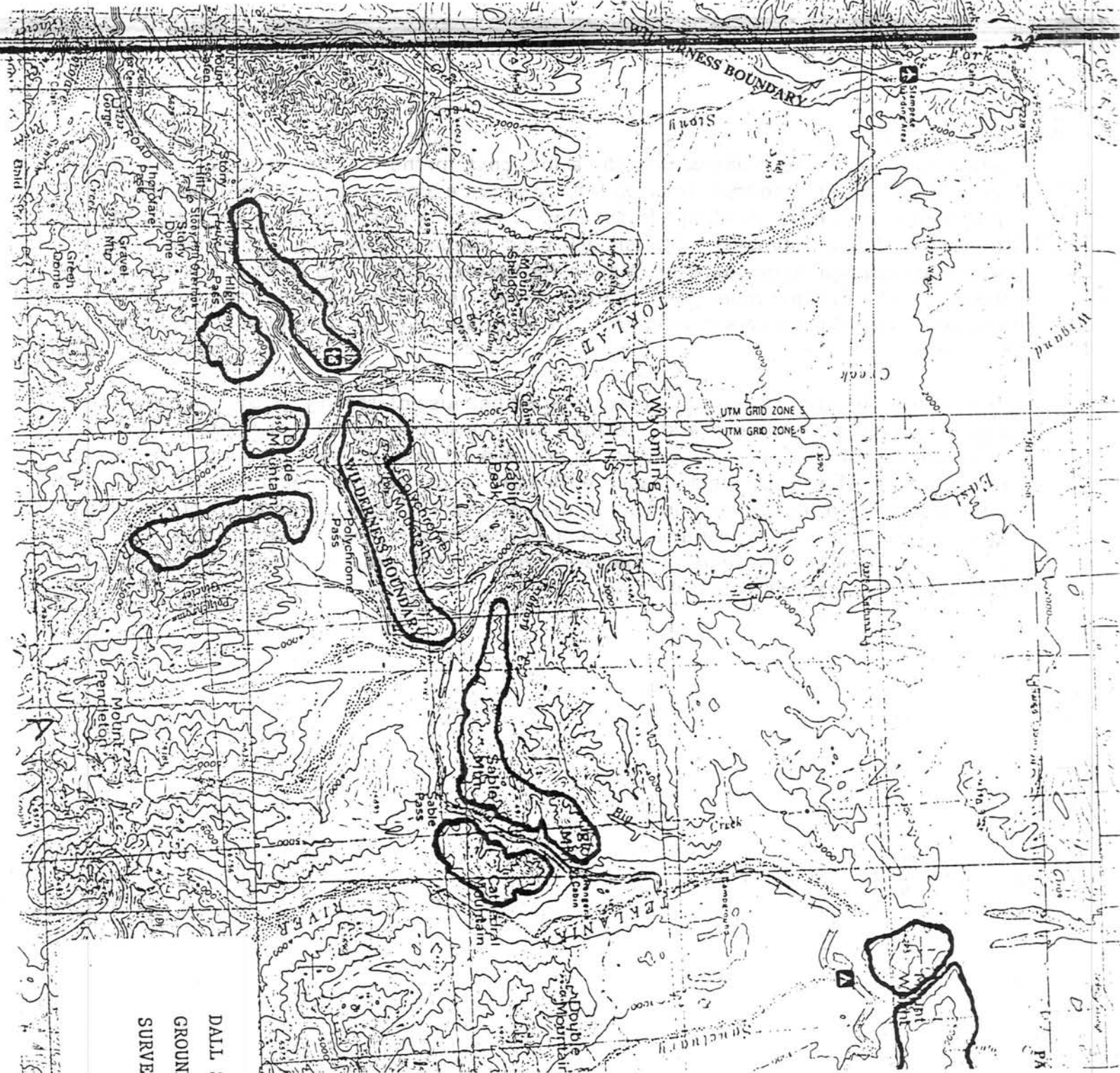
Survey flights were conducted on 10 and 12 July in a Piper PA-18 aircraft, and totaled 9.5 hours of flight time. A total of 371 sheep were counted. The total count included 192 "ewe-like" animals, 72 lambs, 21 - 1/4 curl rams, 38 - 1/2 curl rams, 33 - 3/4 curl rams, and 15 - 4/4 curl rams (see Table 3). Field maps can be found in Appendix A.

CONCLUSIONS AND RECOMMENDATIONS

The results of the present survey can be compared with previous-years' data to determine trends in sheep composition and abundance. It is important to continue with sheep trend counts. With this in mind, the major consideration is that future sheep surveys be done so as to allow comparison with this and previous efforts. Surveys should continue to include late June or early July ground-based composition counts of the road corridor survey area followed by aerial counts and composition surveys in the old park and southwest preserve units with a Supercub or similar aircraft. Identification of ewes, lambs, yearlings, and rams is important for sex and age ratio determination. The delineation of the park road corridor into survey areas was begun in 1974 with the advent of the ground-based counts and continued to the present survey. The old park aerial count survey unit was originally delineated in 1992 with the initiation of that survey. Keeping these geographic areas as consistent as possible will make comparisons between years easier.

While the current techniques provide a low-cost method to determine trends in composition and abundance, they do little to provide a concrete index to population abundance or sex composition. In portions of the park it is important to be able to make abundance estimates. Statistically valid population dynamics information is necessary to begin to evaluate the relationship between Dall sheep and humans within the park. The existing monitoring strategy should be supplemented or modified so it can be carried out by park managers at an adequate level for hunted and unhunted populations.

The Eastern Region of Denali is of great interest because of its long history of ground-based composition surveys and the fact that the population is not hunted. It is desirable to obtain as precise a count as possible, in order to detect changes in the population. The Southwest Preserve Region is of interest because anecdotal information from local guides indicates that numbers of full-curl rams on preserve lands are declining. It is desirable to obtain precise counts, with an emphasis on sex composition, within this region to better understand the exact effects of harvest on Dall sheep populations within the park.



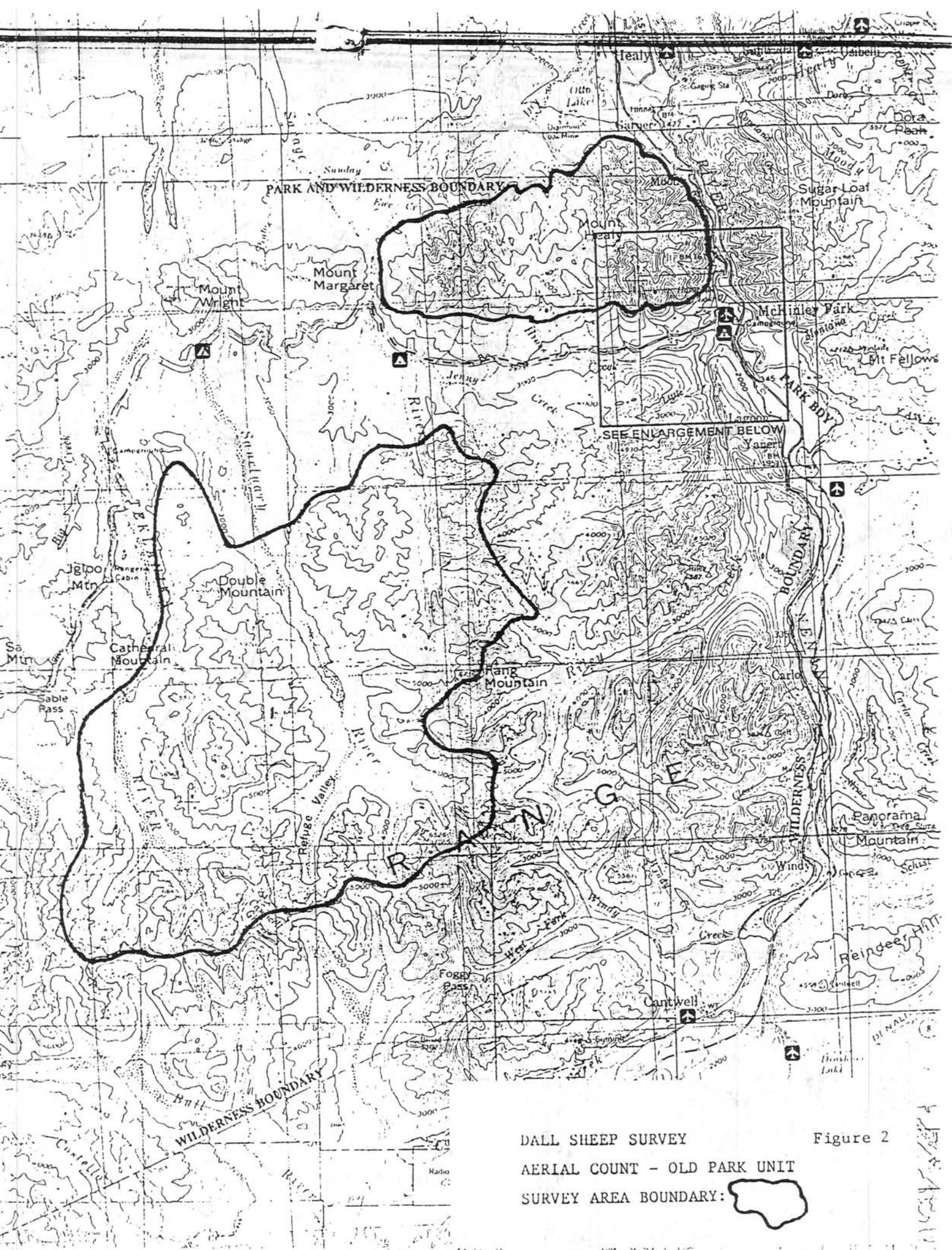
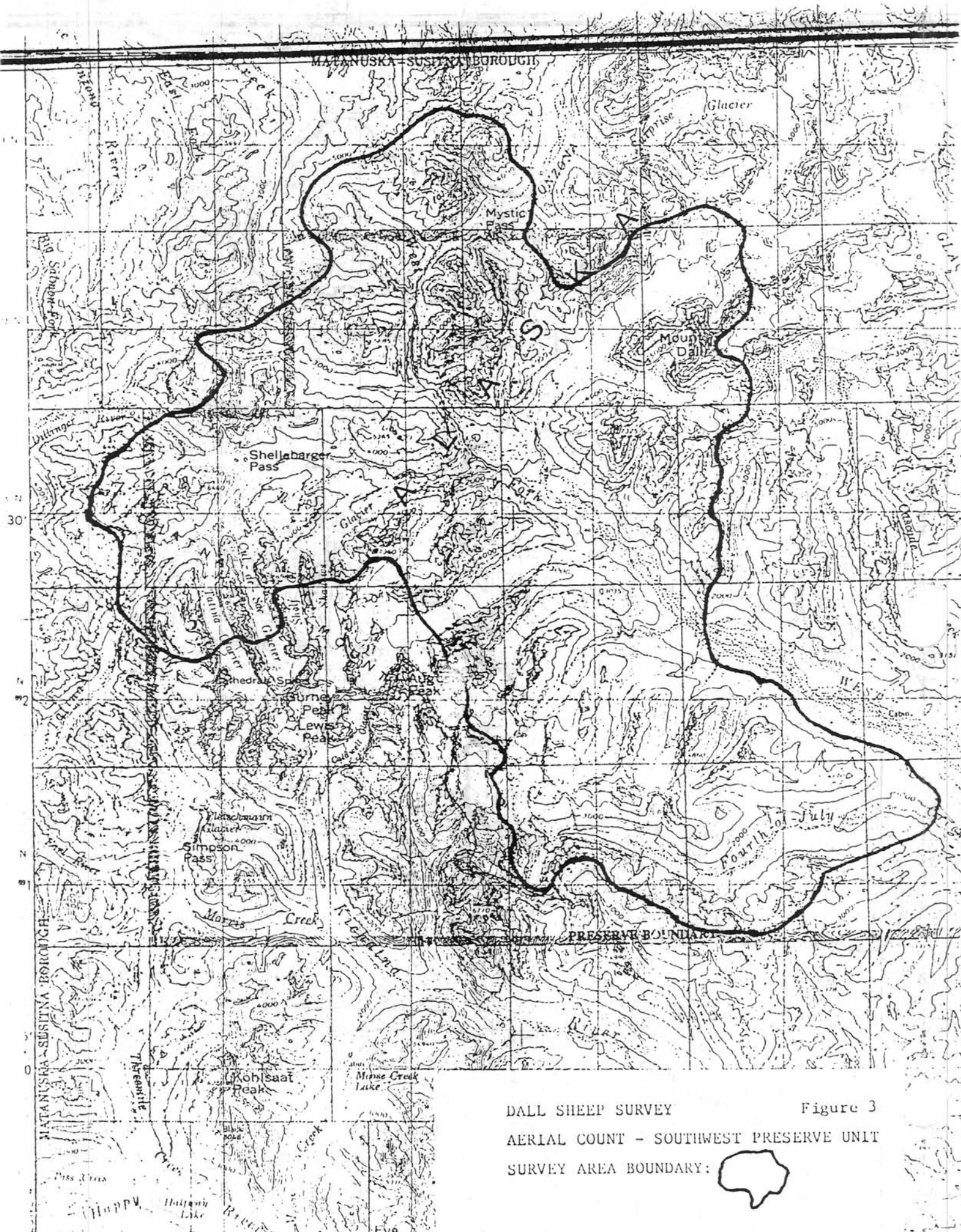


Figure 2



DALL SHEEP SURVEY

Figure 3

AERIAL COUNT - SOUTHWEST PRESERVE UNIT

SURVEY AREA BOUNDARY:



TABLE 1: RAW DATA, DENALI NATIONAL PARK GROUND-BASED SHEEP SURVEY 1995

						RAMS							
DATE	BAND #	EWES	YRLGS	LAMBS	E/Y UNCLASS	1/4	1/2	3/4	4/4	UNCLASS	TOTAL	LOCATION	
27JUN	1	3	2	2							7	Cathedral Mt. Drainage No. of upper Igloo Cr. bridge to East.	
27JUN	2	9	4	2		1					16	"	
27JUN	3	5	1	2							8	"	
27JUN	4	2	1			1					4	"	
27JUN	5	5	1								6	"	
27JUN	6	1									1	"	
27JUN	7	8		6							14	Cathedral Mt. East of upper Igloo Cr. bridge	
27JUN	8	14	2	9		3					28	Igloo Mt.	
27JUN	9	1			1	1					3	Igloo Mt.	
27JUN	10	6	5	3		4					18	No. of Tattler Cr	
28JUN	11	23	6	11	1	2					43	Toklat Rd. Camp East of River	
TOTAL	11	77	22	35	2	12					148		

TABLE 2: RAW DATA, DENALI NATIONAL PARK AERIAL SHEEP SURVEY 1995 OLD PARK UNIT

TABLE 2: RAW DATA, DENALI NATIONAL PARK											
				RAMS							
DATE	BAND #	UNCLASS EWE-LIKE	LAMBS	1/4	1/2	3/4	4/4	UNCLASS	TOTAL	LOCATION	
29JUN	1			1	3				4	Outer Range, VABM Moody	
29JUN	2	21	5		1				27	Outer Rng. Sheep Cr.	
29JUN	3			2	3	6	2		13	Outer Rng. Mt. Healy	
29JUN	4	34	11						45	Outer Rng. Dry Cr.	
29JUN	5	12	7						19	Outer Rng. Dry Cr.	
29JUN	6	7	4						11	Outer Rng. Dry Cr.	
29JUN	7	8	4						12	Outer Rng. Dry Cr.	
29JUN	8	2							2	Outer Rng. Dry Cr.	
29JUN	9	28	7						35	Outer Rng. Ewe Cr.	
29JUN	10	5							5	Outer Rng. Ewe Cr.	
29JUN	11				2				2	Outer Rng. Jenny Cr.	
29JUN	12	2							2	Outer Rng. Hines Cr.	
29JUN	13			2					2	Outer Rng. Hines Cr.	
29JUN	14			1	2	1			4	Outer Rng. Hines Cr.	
29JUN	15	4							4	Outer Rng. Hines Cr.	
29JUN	16			1	4	10	1		16	Outer Rng. Hines Cr.	
29JUN	17	2							2	Outer Rng. Rock Cr.	

TABLE 2: RAW DATA, DENALI NATIONAL PARK AERIAL SHEEP SURVEY 1995 OLD PARK UNIT (CONTINUED)

DATE	BAND #	UNCLASS EWE-LIKE	LAMBS	RAMS					TOTAL	LOCATION
				1/4	1/2	3/4	4/4	UNCLASS		
29JUN	18			1		3	2		6	Outer Rng. Rock Cr.
29JUN	19				1	1			2	Outer Rng. Rock Cr.
29JUN	20				1	4	1		6	Upper Savage River
29JUN	21			1					1	Upper Savage River
29JUN	22	9	4						13	Upper Savage River
29JUN	23	25	3						28	Sanctuary River
29JUN	24				1	2			3	Upper Sanctuary River
29JUN	25					3			3	Upper Sanctuary River
29JUN	26					3			3	Sanctuary River
29JUN	27							9	9	Refuge Valley
29JUN	28					1			1	Refuge Valley
29JUN	29	14	4						18	Upper Sanctuary River
29JUN	30	55	12						67	Sanctuary River
29JUN	31	11	5						16	Sanctuary River
29JUN	32	8							8	Sanctuary River
29JUN	33	2	2						4	Double Mountain
29JUN	34	19	7						26	Calico Cr.

TABLE 2: RAW DATA, DENALI NATIONAL PARK AERIAL SHEEP SURVEY 1995 OLD PARK UNIT (CONTINUED)

DATE	BAND #	UNCLASS EWE-LIKE	LAMBS	RAMS					TOTAL	LOCATION
				1/4	1/2	3/4	4/4	UNCLASS		
29JUN	35				2	4	2		8	Calico Cr.
29JUN	36	6	3						9	Teklanika River
29JUN	37	9							9	Upper Teklanika River
29JUN	38				1	3			4	Upper Teklanika River
29JUN	39			3	3	6	2		14	Upper Teklanika River
29JUN	40	7	3						10	Teklanika River
29JUN	41	30	11						41	Teklanika River
TOTAL	41	320	92	12	24	47	10	9	514	

TABLE 3: RAW DATA, DENALI NATIONAL PARK AERIAL SHEEP SURVEY 1995 SOUTHWEST PRESERVE UNIT

DATE	BAND #	UNCLASS EWE-LIKE	LAMBS	RAMS					UNCLASS	TOTAL	LOCATION
				1/4	1/2	3/4	4/4				
10JUL	1					2				2	West Fork Yentna River
10JUL	2				1	2				3	Mount Dall
10JUL	3				2					2	Mount Dall
10JUL	4					2				2	Mount Dall
10JUL	5	5	2							7	Mount Dall
10JUL	6				2	1				3	Mount Dall
10JUL	7			1	1					2	North of Mount Dall
10JUL	8			1						1	North of Mount Dall
10JUL	9				1					1	West Fork Yentna River
10JUL	10						1			1	West Fork Yentna River
10JUL	11			1		1				2	West Fork Yentna River
10JUL	12					1	1			2	West Fork Yentna River
10JUL	13			1	1	1	1			4	West Fork Yentna River
10JUL	14				4	2	1			7	West Fork Yentna River
10JUL	15					2				2	West Fork Yentna River
10JUL	16			2	2					4	West Fork Yentna River
10JUL	17						1			1	Mystic Pass

TABLE 3: RAW DATA, DENALI NATIONAL PARK AERIAL SHEEP SURVEY 1995 SOUTHWEST PRESERVE UNIT (CONTINUED)

DATE	BAND #	UNCLASS EWE-LIKE	LAMBS	RAMS					TOTAL	LOCATION
				1/4	1/2	3/4	4/4	UNCLASS		
10JUL	18				1	1			2	Mystic Pass
10JUL	19	2	2						4	Tonzona River
10JUL	20	20	10						30	Tonzona River
10JUL	21	4	2						6	Tonzona River
10JUL	22	5	4						9	Mystic Pass
10JUL	23	7	3						10	West Fork Yentna River
10JUL	24			1	1				2	West Fork Yentna River
10JUL	25	6	2						8	West Fork Yentna River
10JUL	26					1			1	West Fork Yentna River
10JUL	27			1	3				4	West Fork Yentna River
10JUL	28	4	1						5	West Fork Yentna River
10JUL	29					3	2		5	West Fork Yentna River
10JUL	30	13	5						18	West Fork Yentna River
10JUL	31	3	1						4	West Fork Yentna River
10JUL	32	14	3						17	West Fork Yentna River
10JUL	33					2			2	West Fork Yentna River
10JUL	34	2							2	West Fork Yentna River

TABLE 3: RAW DATA, DENALI NATIONAL PARK AERIAL SHEEP SURVEY 1995 SOUTHWEST PRESERVE UNIT (CONTINUED)

DATE	BAND #	UNCLASS EWE-LIKE	LAMBS	RAMS					TOTAL	LOCATION
				1/4	1/2	3/4	4/4	UNCLASS		
10JUL	35			1					1	West Fork Yentna River
10JUL	36	10	3						13	West Fork Yentna River
10JUL	37				2	3			5	West Fork Yentna River
10JUL	38			3			1		4	West Fork Yentna River
10JUL	39						2		2	West Fork Yentna River
10JUL	40				2	2	1		5	West Fork Yentna River
10JUL	41				2	2	1		5	West Fork Yentna River
10JUL	42				4		1		5	West Fork Yentna River
10JUL	43	1							1	West Fork Yentna River
10JUL	44	2	1						3	Shellabarger Pass
10JUL	45	15	8						23	Shellabarger Pass
12JUL	1			3	2	1	1		7	West Fork Yentna River
12JUL	2	9							9	West Fork Yentna River
12JUL	3			3					3	West Fork Yentna River
12JUL	4	14	3						17	Shadows Glacier
12JUL	5	15	5						20	West Fork Yentna River

TABLE 3: RAW DATA, DENALI NATIONAL PARK AERIAL SHEEP SURVEY 1995 SOUTHWEST PRESERVE UNIT (CONTINUED)

DATE	BAND #	UNCLASS EWE-LIKE	LAMBS	RAMS					UNCLASS	TOTAL	LOCATION
				1/4	1/2	3/4	4/4				
12JUL	6	16	4							20	Tatina River
12JUL	7				3	2	1			6	Tatina Glacier
12JUL	8				1					1	Tatina River
12JUL	9	2	2							4	Tatina River
12JUL	10	4	3							7	Tatina River
12JUL	11	3	2							5	Tatina River
12JUL	12	9	4							13	Tatina River
12JUL	13	7	2							9	Upper Dillinger River
12JUL	14			3	3	2				8	Upper Dillinger River
TOTAL	59	192	72	21	38	33	15			371	

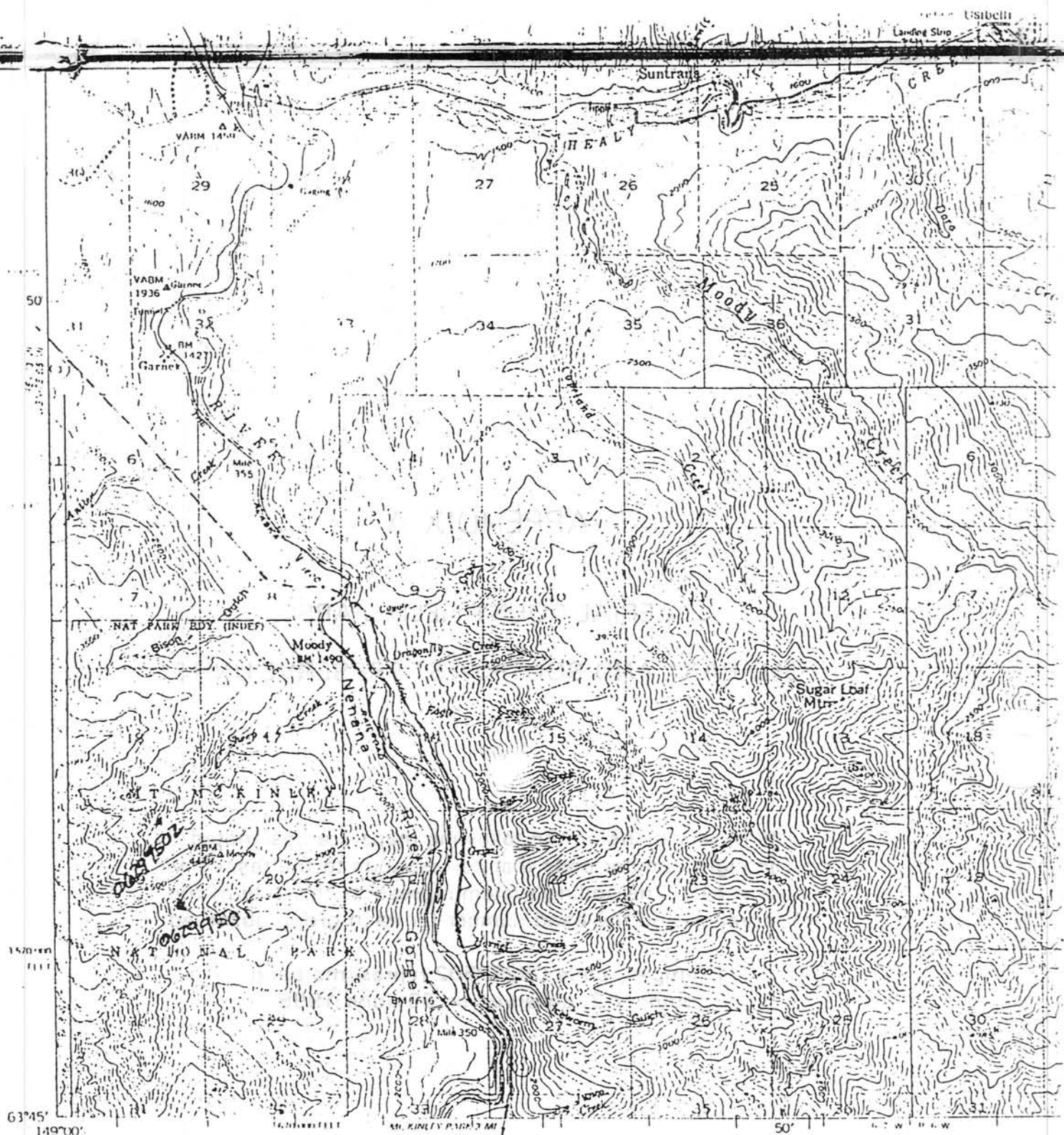
APPENDIX A

AERIAL COUNT FIELD MAPS

OLD PARK AND SOUTHWEST PRESERVE UNITS

All observations on the following maps are designated by an eight-number code that corresponds to the respective data sheet. The coding system represents the date of the observation and the band number for each group observed.

**Example: code 06299502 represents band
number 2, observed on 29 June 1995**

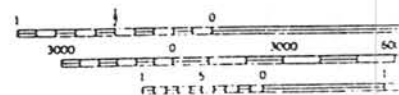
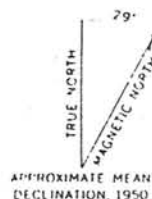


Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs
taken 1949, field annotated 1950. Map not field checked

Universal Transverse Mercator projection 1927 North American datum
10,000 foot grid based on Alaska coordinate system, zone 4
1000 meter Universal Transverse Mercator grid ticks,
zone 6, shown in blue

Gray land lines represent unsurveyed and unmarked locations
predetermined by the Bureau of Land Management
Folio T-10, Fairbanks Meridian



CO
DOTED
NATION

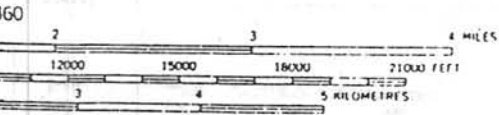
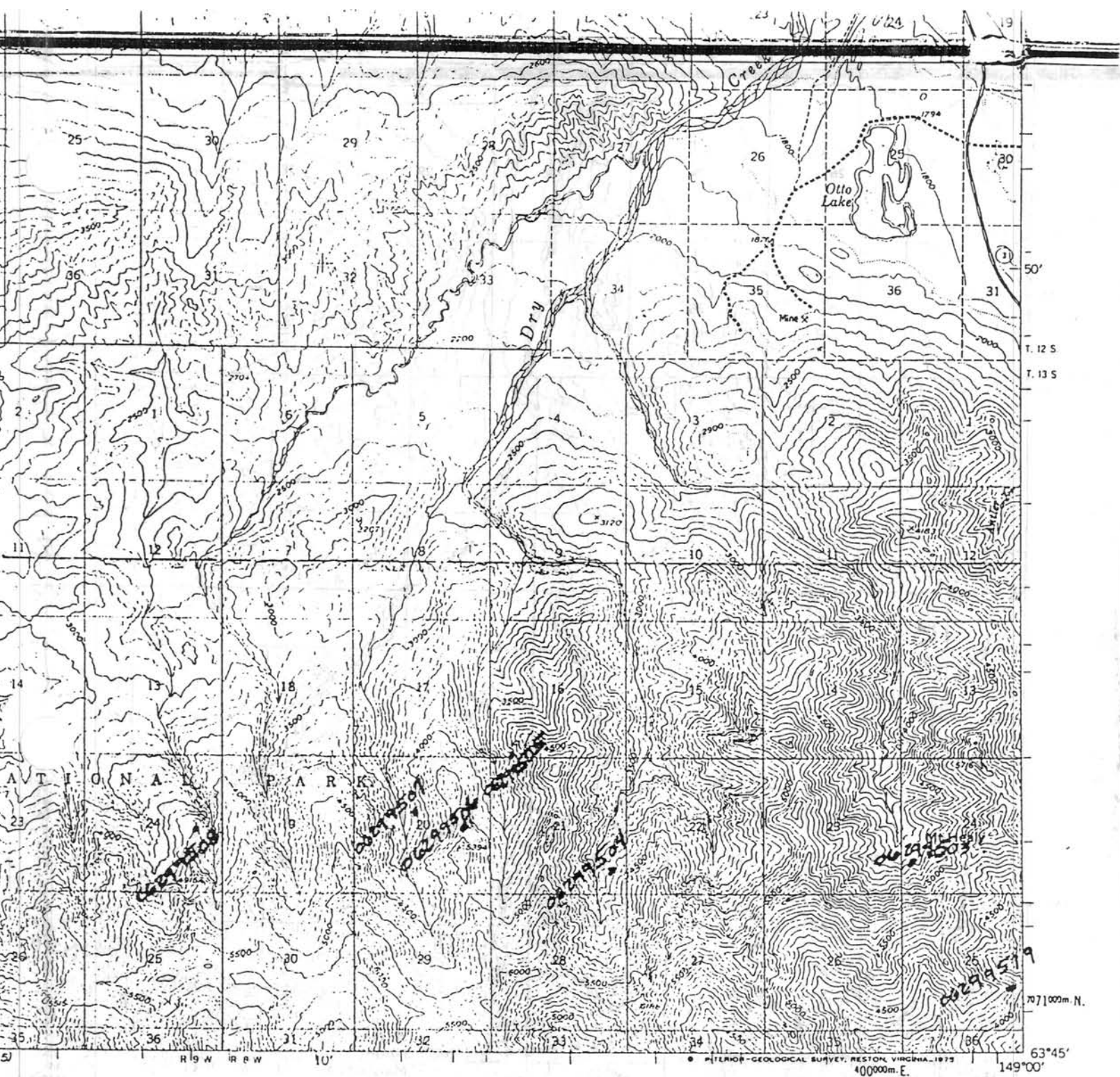
FAIRBANKS, ALASKA
A FOLDER DESCRIBED

ALL
DET
OGP

HEALY D-4

Aerial count: Old Park unit

29 June 1995



100 FEET
FOOT CONTOURS
DATUM OF 1929

GEOLOGICAL SURVEY
RESTON, VIRGINIA 22092
AVAILABLE ON REQUEST



QUADRANGLE LOCATION

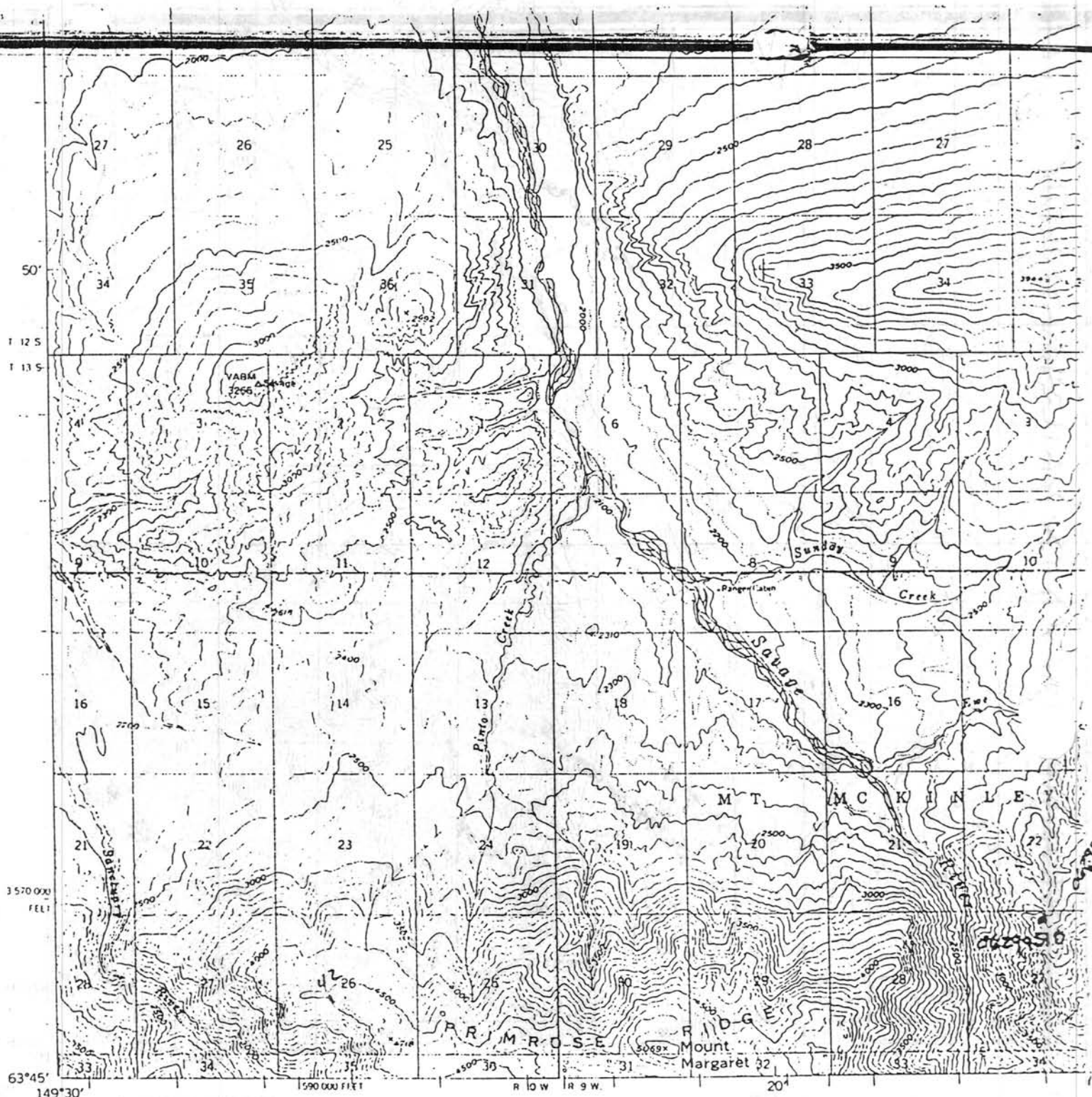
ROAD CLASSIFICATION
Medium duty ——— Unimproved dirt - - - - -
○ State Route

HEALY (D-5), ALASKA
N6345-W14900/15X30

1951

MINOR REVISIONS 1973

Aerial count - Old Park Unit
29 June 1995



HEALY C-6
Mapped, edited, and published by the Geological Survey
Control by USGS and USC&GS

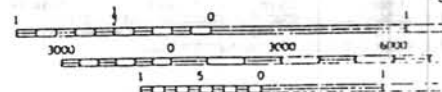
Topography by photogrammetric methods from aerial photographs
taken 1949, field annotated 1951. Map not field checked

Universal Transverse Mercator projection, 1927 North American datum
10,000 foot grid based on Alaska coordinate system, zone 4
1000 metre Universal Transverse Mercator grid ticks,
zone 6, shown in blue

Gray land lines represent unsurveyed and unmarked
locations predetermined by the Bureau of Land Management
Folio F-10, Fairbanks Meridian



APPROXIMATE MEAN
DECLINATION, 1951



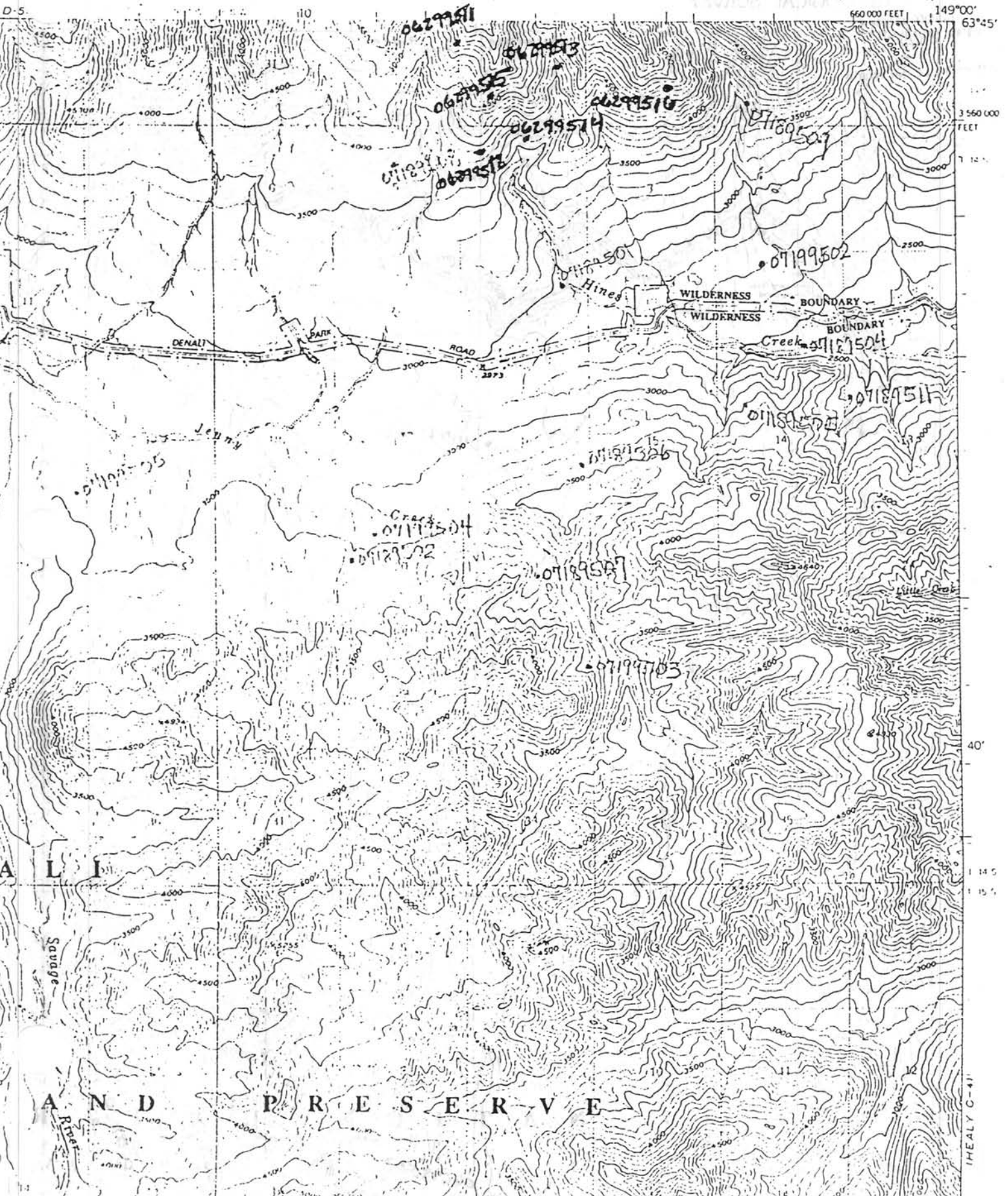
CONTROL
DOTTED LINE
NATIONAL GEO

FOR
FAIRBANKS, ALASKA 9970
A FOLDER DESCRIBING

HEALY D-5

Aerial Count - Old Park
unit
29 June 1996

HEALY D



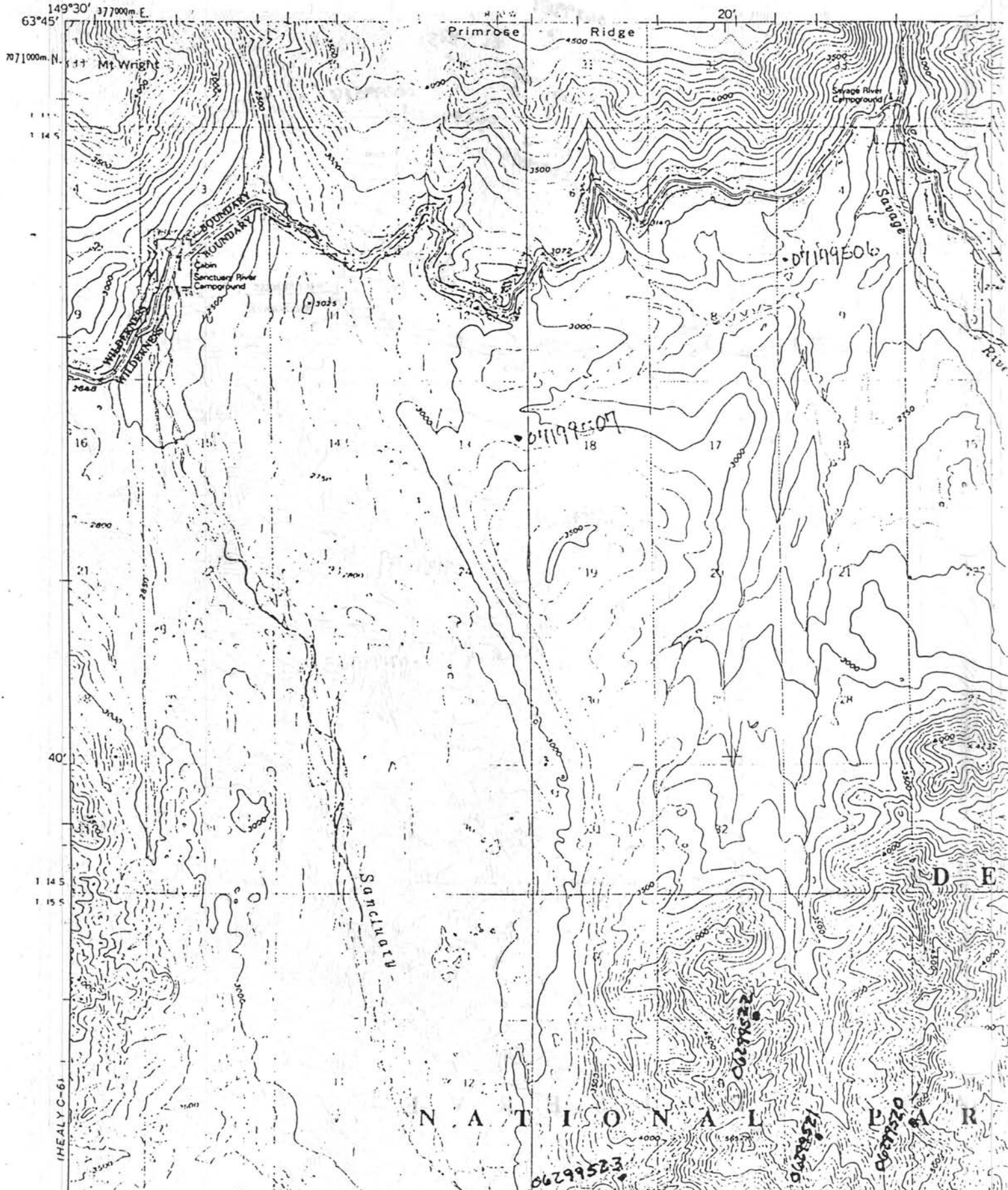
Aerial count old Park unit

29 June 1995

HEALY (6-5)

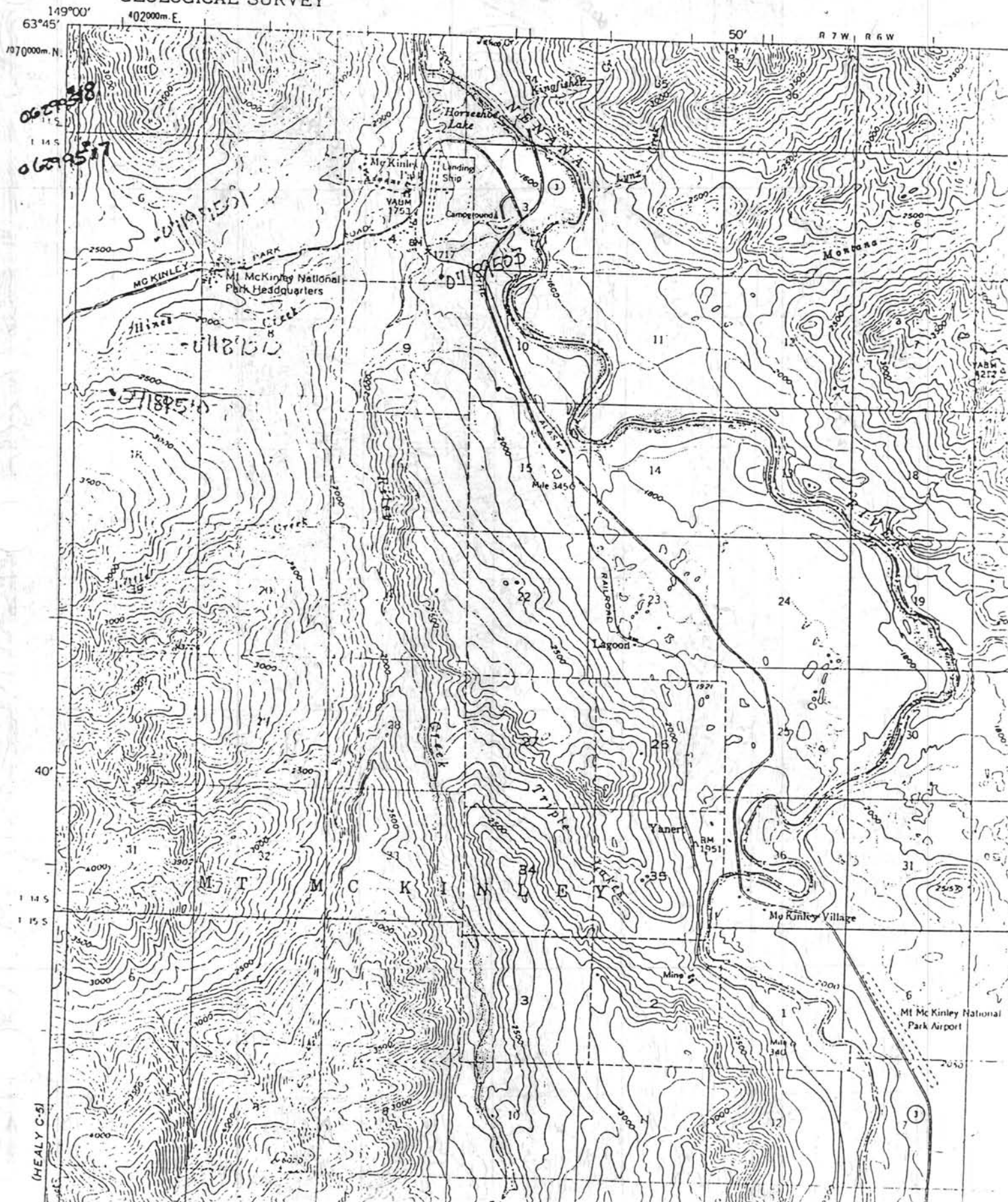
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

(HEALY D-6)



29 June 1995

402000m. E.



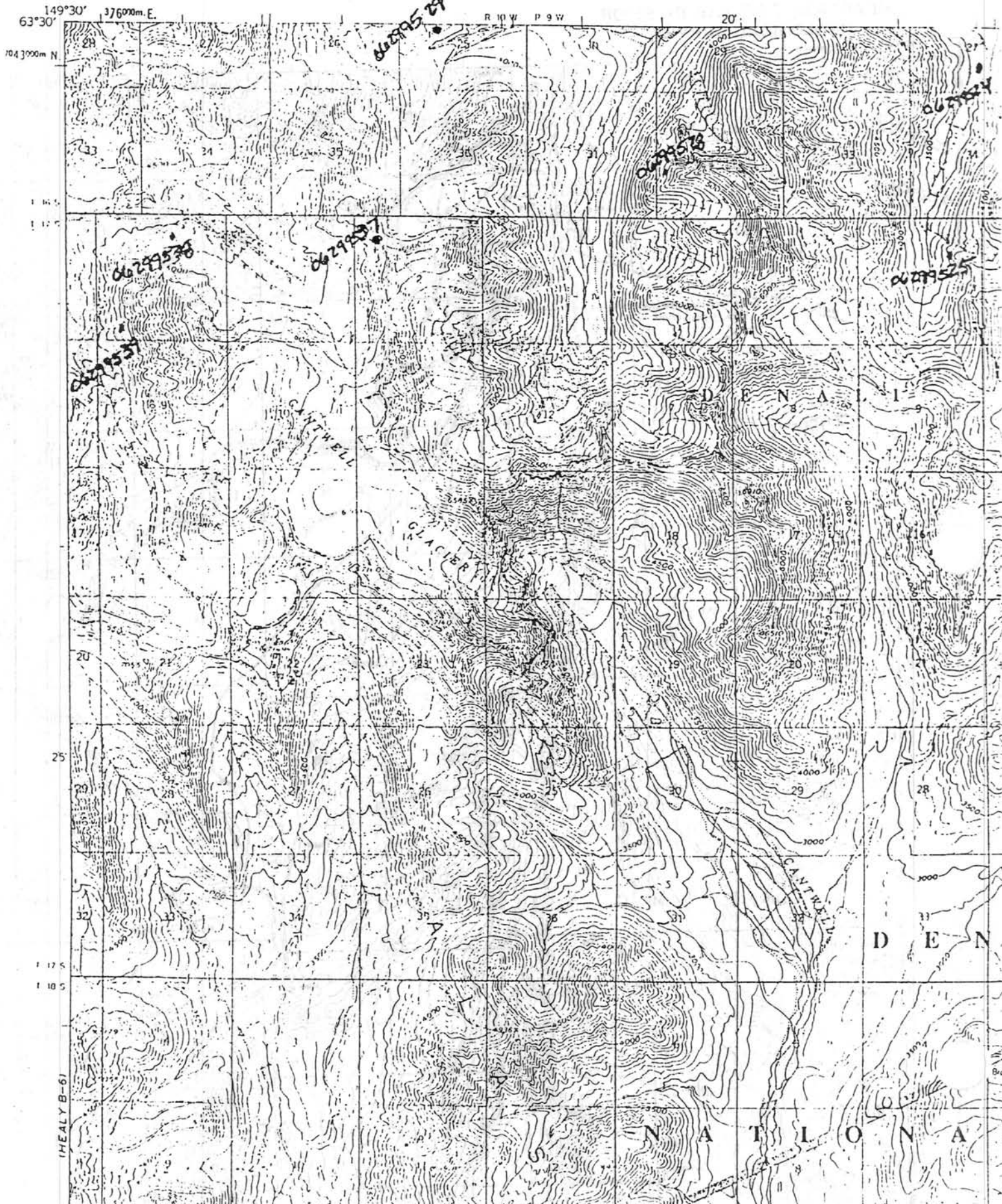
Healy (B.5)

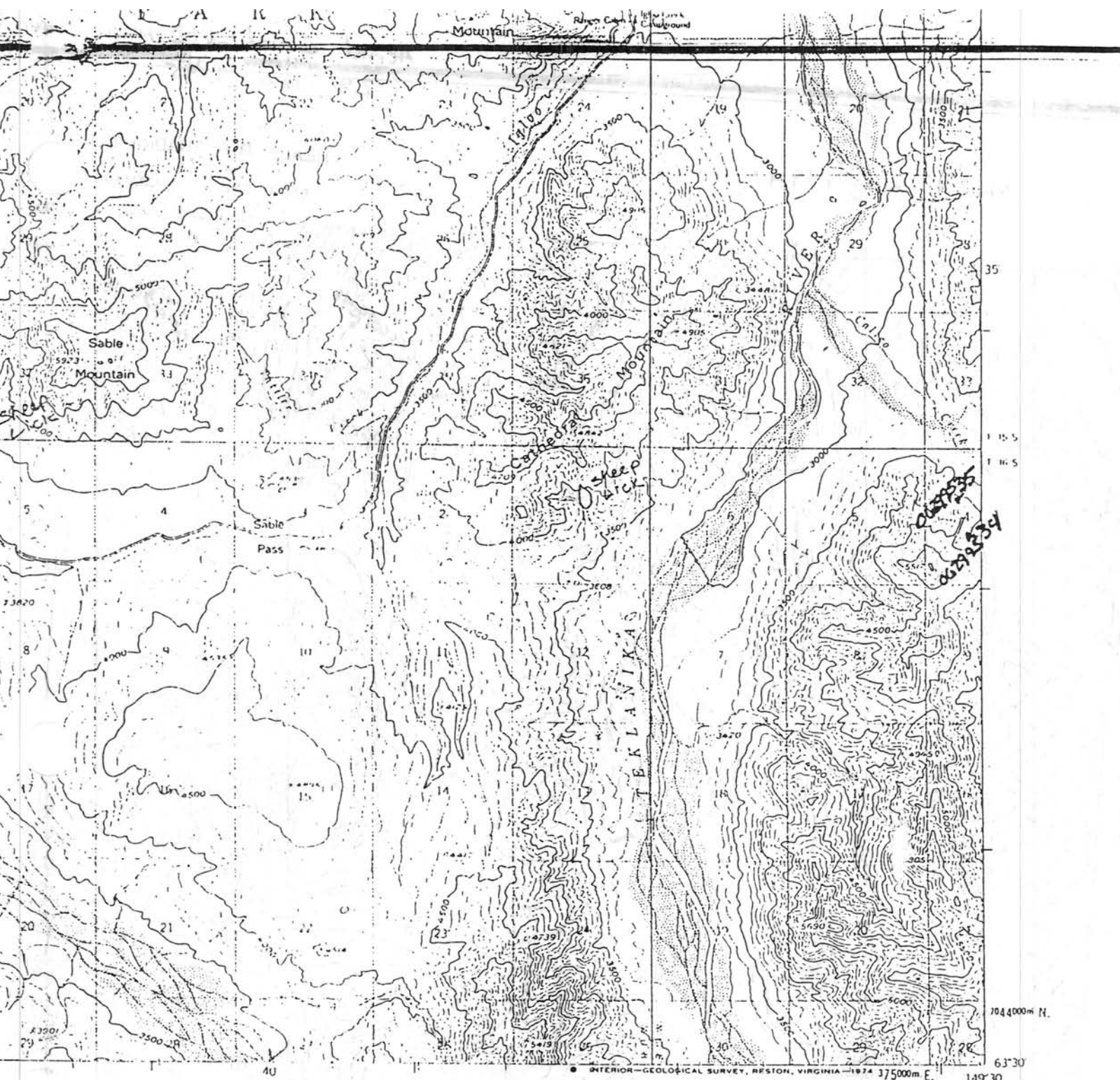
29 June 1995

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

149°30' 376000m. E.
63°30' 500000 1000000

1043000m N





ROAD CLASSIFICATION
Light duty

HEALY (C-6), ALASKA
N6330 - W14930/15X30

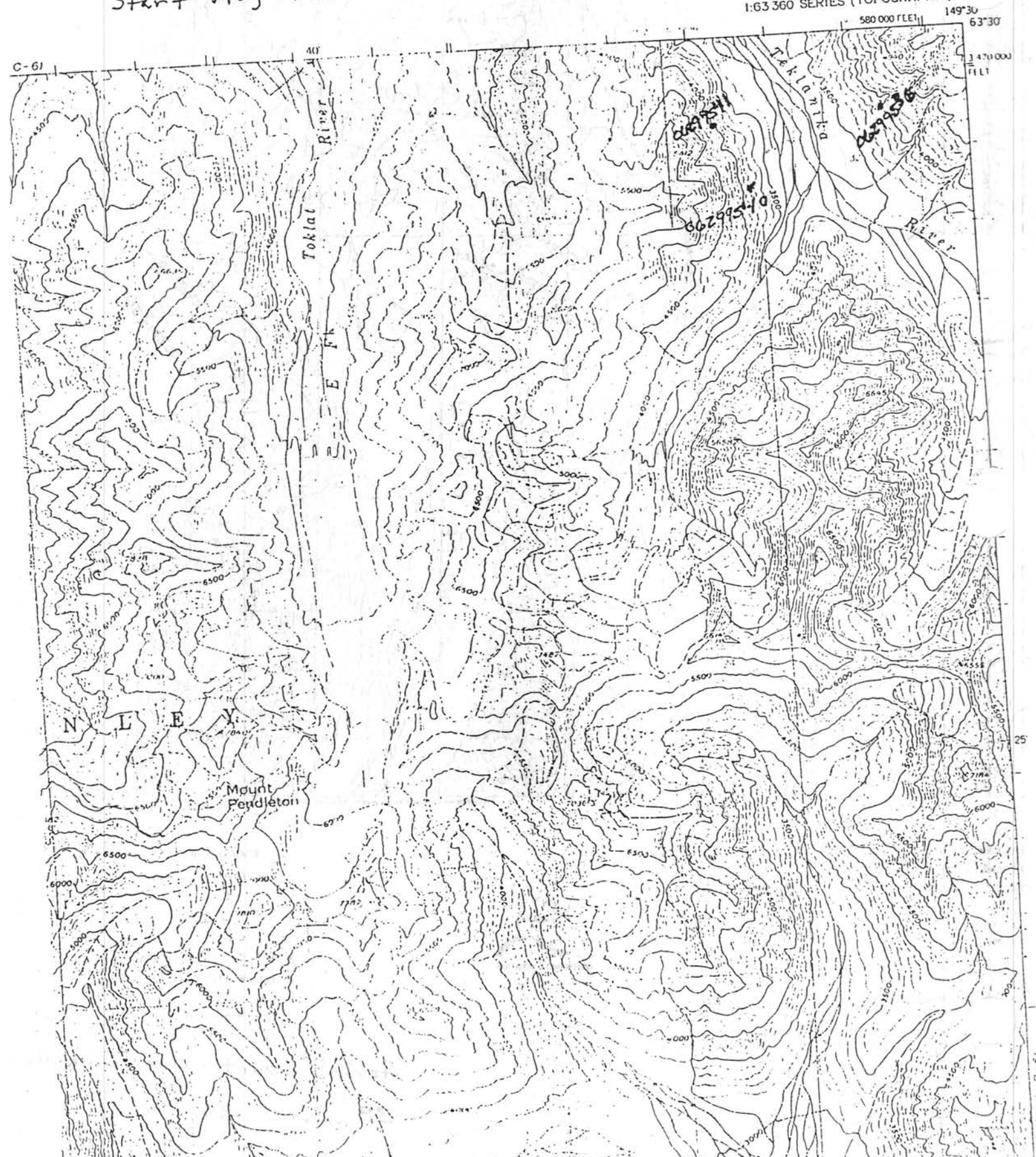
1954
MINOR REVISIONS 1964

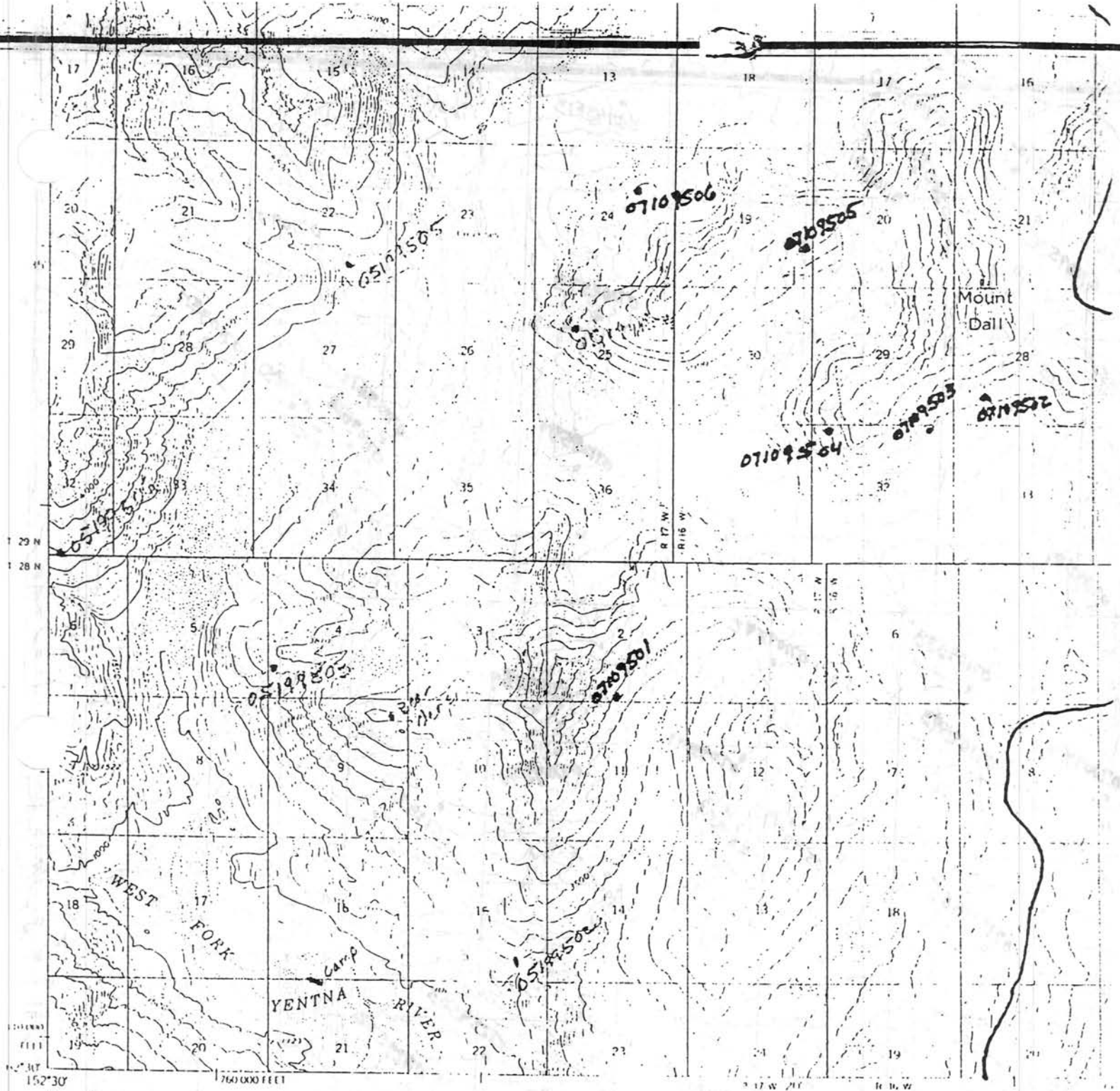
Aerial Count - Old Park Unit
29 June 1995

29 June 1945

start Aug 1993

HEALY (B-6) QUADRANGLE
ALASKA
1:63,360 SERIES (TOPOGRAPHIC)





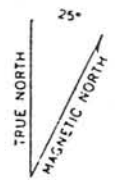
Mapped, edited, and published by the Geological Survey

Control by USGS

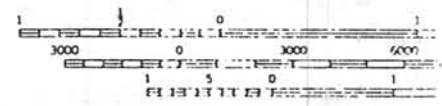
Topography by photogrammetric methods from aerial photographs taken 1952 and 1957, field annotated 1958. Map not field checked

Universal Transverse Mercator projection, 1927 North American datum 10,000 foot grid based on Alaska coordinate system, zone 5 1000 meter Universal Transverse Mercator grid ticks, zone 5, shown in blue

Gray land lines represent unsurveyed and unmarked locations predetermined by the Bureau of Land Management Folios S 2 and S 3, Seward Meridian



APPROXIMATE MEAN DECLINATION, 1958



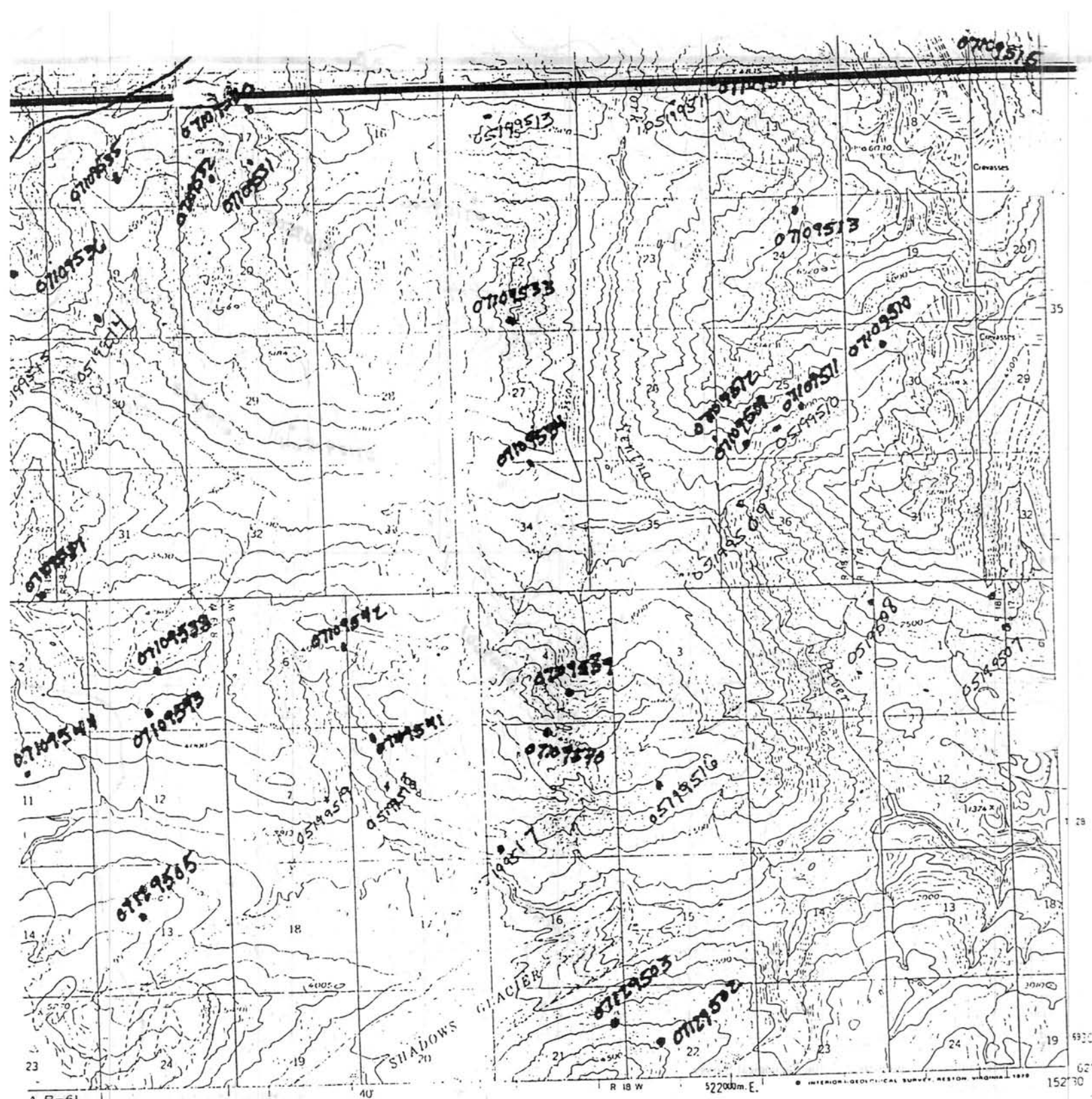
CONTINENTAL

FOR SALE BY
FAIRHANKS, ALASKA 99701, DENVER
A FOLDER DESCRIBING TOPOGRAPHY

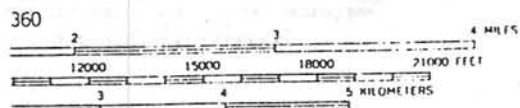
TALKEETNA (C-5)

Aerial Count - Southwest Preserve Unit

10-12 July 1995



A B-61



100 FEET
1:62,500 DATUM OF 1929

TOPOGRAPHIC SURVEY
U.S. GEOLOGICAL SURVEY REGIONAL DIVISION, VIRGINIA 22092
SYMBOLS IS AVAILABLE ON REQUEST



TALKFETNA (C-6), AI
NG230-W15230/15X30
1958
LIMITED REVISIONS 1977

Aerial Count - Southwest Preserve Unit

10-17 JULY 1995

Aerial count - South - 4 Preserve 11 +
10-12 July 1995

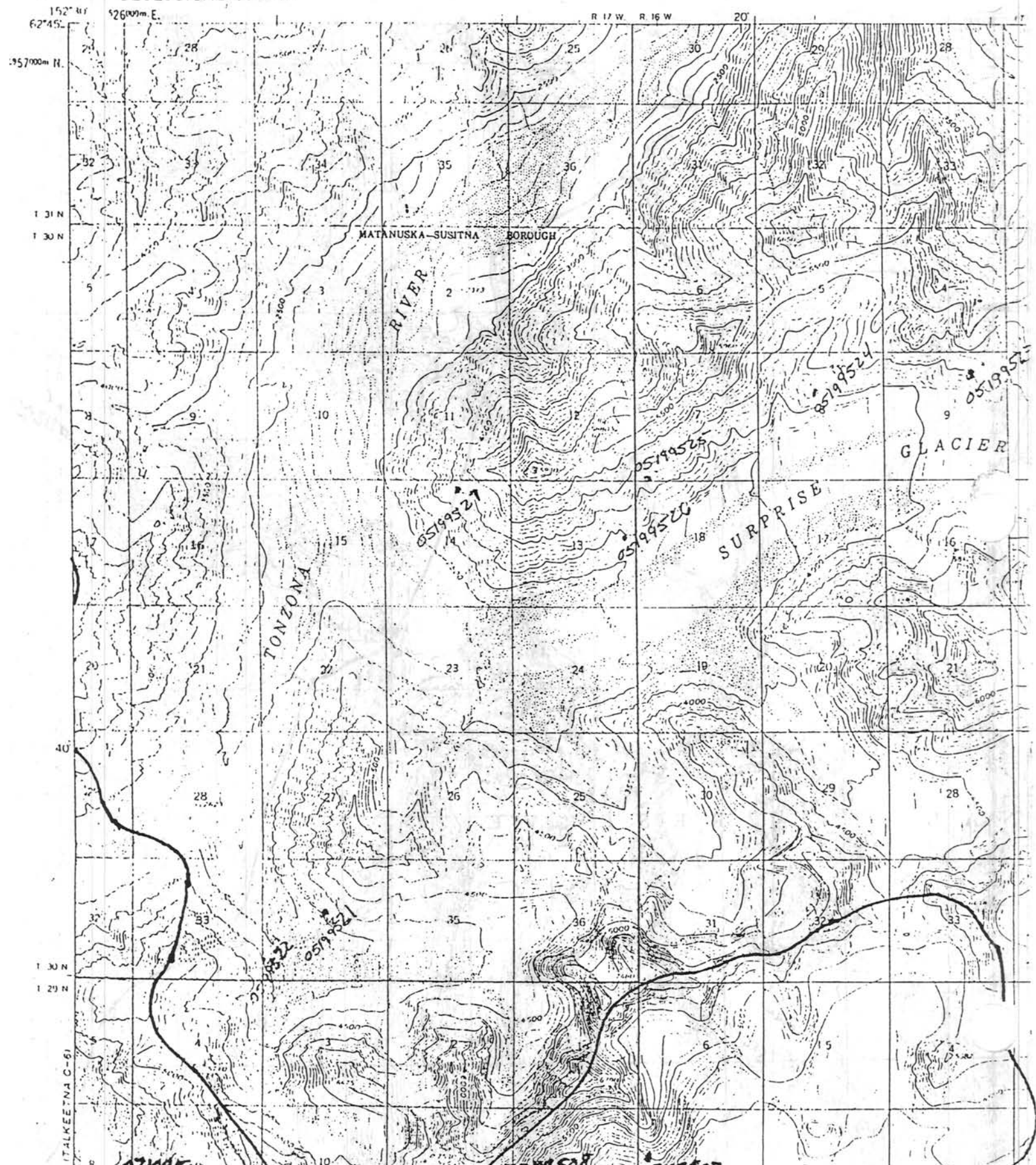
TALKEETNA (B-6) QUADRANGLE
ALASKA - MATANUSKA - SUSITNA BOROUGH
1:63,360 SERIES (TOPOGRAPHIC)



TALKEETNA (C-5)

10-12 July 1995

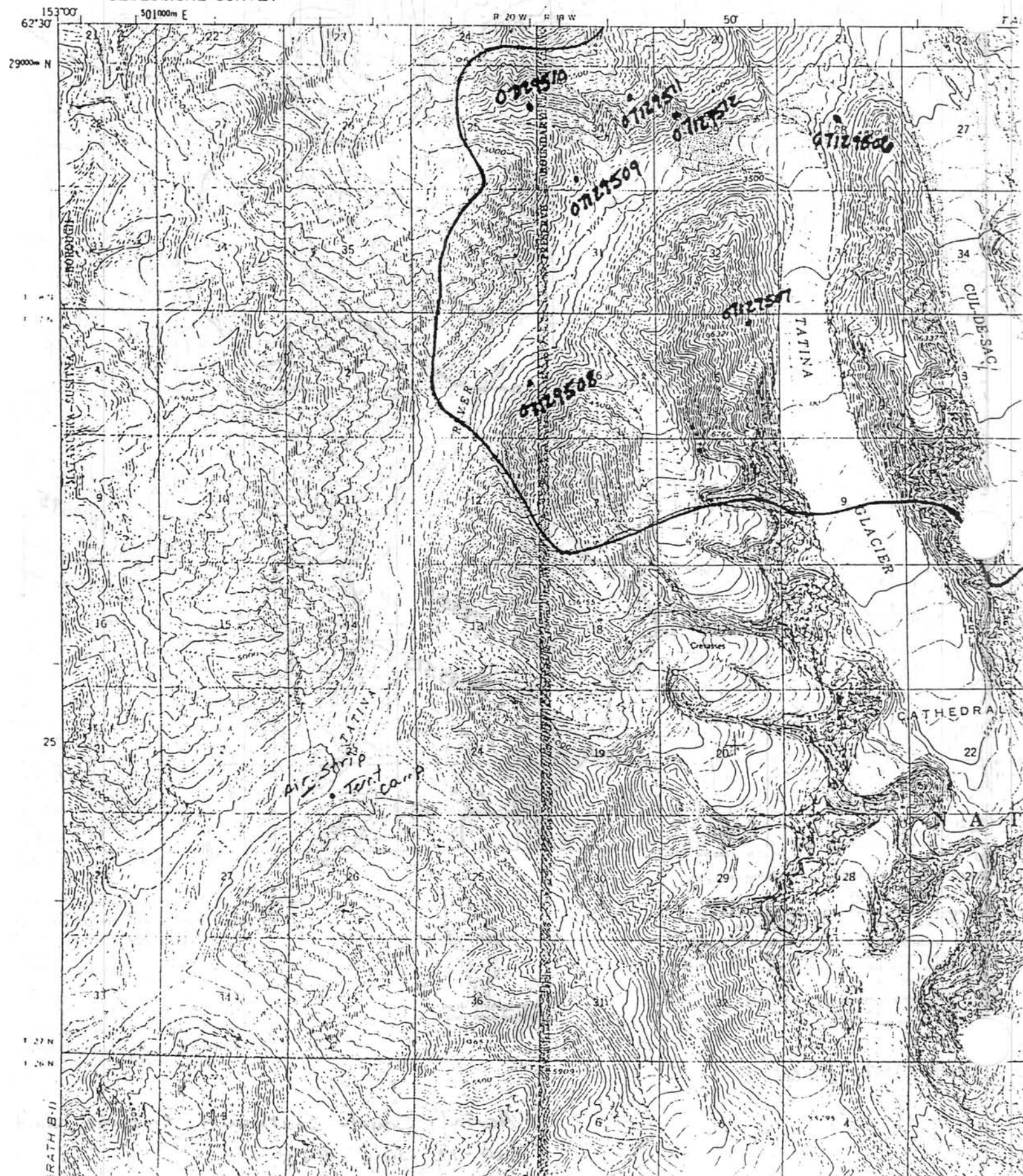
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



~~3 East Southwest Preserve Inc.~~
TALKEETNA (B-G)

10-12 July 1995

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



10-12 July 1995

1:63 360 SERIES (TOPOGRAPHIC)

