PEREGRINE FALCON SURVEYS IN SELECTED AREAS OF NESTING HABITAT ALONG THE PROPOSED NORTHWEST ALASKAN PIPELINE COMPANY ROUTE IN ALASKA, 1980

INTERIM REPORT

Prepared For & Funded By

NORTHWEST ALASKAN PIPELINE COMPANY

Administered By

FLUOR NORTHWEST, INC.

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Task 3

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3 September 1980

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INTRODUCTION

Northwest Alaskan Pipeline Company (NWA) has proposed to build a large-diameter, chilled-gas pipeline from Prudhoe Bay, Alaska, to the midwestern United States. The Alaskan segment of the proposed alignment parallels the now-existing Trans-Alaskan Pipeline System (TAPS) between Prudhoe Bay and Delta Junction. At Delta Junction, the proposed gas pipeline alignment diverges southeastward to follow the Alaska Highway and nearby (currently decommissioned) Haines oil pipeline right-of-way to the U.S.-Canadian border.

The proposed gas pipeline route in Alaska parallels major sections of the Sagavanirktok River and the Tanana River, and crosses the Yukon River. These three river drainages provide important historical and current nesting habitat for two endangered races of the Peregrine Falcon (*Falco peregrinus tundrius* and *F. p. anatum*). In addition, the proposed gas pipeline alignment passes near a single peregrine nesting location in the interior uplands of Alaska. That location, although not recognized as historically important to that species, was used successfully by a pair of peregrines in 1979 (Roseneau and Bente 1979). During 1980, surveys to locate nesting Peregrine Falcons were conducted in several of the afore-mentioned areas. These surveys were designed to provide updated information on this important species in the vicinity of the proposed gas pipeline alignment, and to compliment other related surveys conducted by federal agency personnel or raptor biologists contracted by them in the same region.

OBJECTIVES

The objectives of the 1980 Task 3 surveys in the vicinity of the proposed gas pipeline route in Alaska were:

1. to determine the presence or absence of Peregrine Falcons at all historical and recently active nesting locations in each of the designated areas of nesting habitat; and

2. to determine the success of each identified nesting attempt.

METHODS

Four areas along the proposed gas pipeline alignment were surveyed for nesting Peregrine Falcons in this study. These areas included

1. the Tanana River course between Tetlin Junction and Fairbanks, including the Salcha River course downstream of the TAPS crossing;

2. a small section of interior uplands near 39 mile Elliott Highway;

3. the Slope Mountain vicinity in the Sagavanirktok River drainage; and

4. the Franklin Bluffs section of the Sagavanirktok River course.

The two remaining areas of nesting habitat, the Sagwon Bluffs section of the Sagavanirktok River course, and the Yukon River course between Stevens Village and Tanana, were also surveyed in 1980. Sagwon Bluffs was surveyed by a joint team composed of Bureau of Land Management (BLM) and United States Fish and Wildlife Service (USFWS) personnel. The Yukon River was surveyed by us during a separate study of Peregrine Falcons that encompassed the entire river course between Fort Hamlin and St. Marys. That study was supported by the National Audubon Society, the United States Fish and Wildlife Service (USFWS) and private funds.

Each of the areas was surveyed on two different occasions with the exception of Slope Mountain. At Slope Mountain the first survey confirmed the presence of only nesting Rough-legged Hawks (*Buteo lagopus*), nesting Common Ravens (*Corvus corax*) and the presence of several other unoccupied nest sites at the known raptor nesting locations. In the other three more important areas surveyed in this study, the two separate surveys

provided an increased chance of locating pairs of Peregrines or single Peregrines that may have failed early in their attempts to nest. The second survey in these three areas also provided valuable information on the reproductive success of each nesting attempt discovered during the initial survey.

The Tanana and lower Salcha rivers were surveyed with the aid of an outboard-powered inflatable raft on 8-12 June and 25-29 July. The Grapefruit Rocks vicinity near 39 mile Elliott Highway was driven to and searched on foot on 8 June and 23 July. Bell 206 B and 206 L Jet Ranger helicopters were untilized to reach areas of nesting habitat in the Sagavanirktok River drainage north of the Brooks Range. Franklin Bluffs was resurveyed on 2 August. The Franklin Bluffs area was searched on foot after helicopters landed the survey team at least one mile horizontially from any known historical or recently active peregrine nesting locations. The Slope Mountain area was searched from the ground and the air after first conferring with D. Money, USFWS. That historical peregrine nesting site is now considered somewhat questionable and its exact location is not clear. As a consequence, aerial restrictions were waived (D. Money personal communications June 1980).

All June and July-August survey data were immediately recorded in the field on USGS 1:63,360 scale topographic maps for subsequent transfer to new 1:63,360 scale topographic maps and to pipeline alignment sheets. During the surveys weather was excellent, except on 5 June and the morning of 6 June when some low cloud cover and intermittant rain storms were encountered on the Arctic Slope, on 10 June when rain and windy conditions were encountered on the Tanana River between George Lake Lodge and the Gerstle River, and on 28 June when overcast conditions with occasional rain squalls were encountered on the Tanana River.

Nest location numbers used on the accompanying map sheets correspond to those established by us in 1979 (Roseneau and Bente 1979). New

observations at previously unnumbered locations have been added where appropriate as decimal numbers (e.g. 218.1) or as a continuation of the list of miscellaneous locations of interest (e.g. "zz").

RESULTS

The results of the 1980 Task 3 surveys for Peregrine Falcons are illustrated on the accompanying set of USGS 1:63,360 scale topographic maps. All nest locations found occupied by peregrines in the 1980 nesting season in all areas, regardless of the data source, are listed in Table 1.

Ten pairs of peregrines and one single individual are known to have inhabited areas in the vicinity of the proposed gas pipeline alignment during the 1980 breeding season (see Table 1). Seven of those pairs were discovered during our NWA surveys of the Tanana River drainage, the Elliott Highway vicinity, the Slope Mountain vicinity of the Sagavanirktok River drainage and Franklin Bluffs in the Sagavanirktok River drainage. The joint team of BLM/USFWS personnel who surveyed Sagwon Bluffs found one nesting pair in that area, and observed one single individual several miles south of the Sagwon Bluffs (R. Ambrose and B. Durtsche personal communication 1980). The two remaining pairs were found by us in the upstream section of the middle Yukon River. Each area of peregrine nesting habitat that occurs in the vicinity of the proposed NWA project is treated briefly below.

Sagavanirktok River Drainage

Franklin Bluffs

Two pairs of peregrines were present along the northern portion of Franklin Bluffs. One pair re-occupied the east-facing nest site at Location 220 where a pair of peregrines successfully hatched nestlings in 1979 (Roseneau and Bente 1979). Based on vocalizations and aggressive behavior, we believe the two birds present in 1980 were the same pair

TABLE 1. Locations occupied by Peregrine Falcons (*Falco peregrinus*) in areas adjacent to or near the proposed Northwest Alaskan Pipeline Company gas pipeline route in Alaska, 1980.

Location Number	Number of Adults	Number of Nestlings Fledged
21a	2	2
29b	2	3
52	2	0
73b	2	0
88.1	2	3
92.1	2	0
97	2	2
211	2	?
218.1	2	0
220	2	2
(Near Happy Valley)	1	-
TOTAL	21	12
	(10 pairs, 1 single adult)	

that nested there in 1979. On 5 June 1980 when we checked this location, the nest scrape contained 4 eggs. The adult female returned to the scrape to brood about 5 minutes after she initially flushed. A second pair of adult peregrines occupied a portion of the west-facing bluffs one mile south of Location 220. That new location was designated number 218.1. The pair was observed on several occasions on both 5 and 6 June. Both birds ranged freely north and south along the bluff front between a point about 0.75 miles south of Location 220 and Location 216 (Roseneau and Bente 1979). Both adults participated in several displays of courtship behavior but were obviously not attending a clutch of eggs as they should have been. These adult peregrines were also essentially non-defensive. They exhibited only the mildest of reactions to us when we hiked a second time through the vicinity where we had initially discovered them perched on the top of the bluff. We re-visited the area one last time late on 6 June 1980. About 100 yards north of where we had initially discovered them the previous day, we discovered the adult female starting to make a nest scrape in an old empty Rough-legged Hawk nest. The male was perched nearby. It became obvious that this pair was still displaying some interest in nesting, although with little vigor.

No other peregrines were observed anywhere along Franklin Bluffs on 5-6 June 1980. At this time much of the area was still either covered with drifted snow or very wet from melt water. All of the lower, more northern bluffs in the vicinity of peregrine nest Location 223 were heavily covered by snowdrifts. As a consequence, nest Location 223 was totally unuseable in 1980, as was the remainder of that section of nesting habitat.

We surveyed Franklin Bluffs again on 2 August 1980. The old Rough-legged Hawk nest at Location 218.1 was empty. No evidence was found there that suggested the pair of peregrines observed at it on 6 June had laid eggs. The only peregrines observed at Franklin Bluffs on 2 August 1980 were the pair at Location 220. That pair successfully reared two

nestlings to fledging age. Both nestlings were just fledging on 2 August.

Sagwon Bluffs

We did not visit Sagwon Bluffs in 1980. A joint BLM/USFWS raptor study was being conducted there throughout the field season and agency personnel surveyed that section of nesting habitat. Only one pair of nesting peregrines occupied the bluff area. R. Ambrose and B. Durtsche (personal communications 1980) reported that the peregrines nested on the east limit of the river at Location 211, the same location used by a pair of peregrines that successfully hatched and fledged nestlings in 1979 (Roseneau and Bente 1979). Only one other peregrine was observed by them. It was seen on several occasions throughout the spring and summer several miles to the south between the southern terminus of Sagwon Bluffs and the old decommissioned Happy Valley construction camp (B. Durtsche personal communication, 2 September 1980).

The outcome of the peregrine nesting attempt at Location 211 in 1980 is unknown. That vicinity was not revisited by agency personnel after the initial spring survey. (B. Durtsche personal communication, 2 September 1980).

Slope Mountain

Peregrine Falcons were not observed during surveys of the Slope Mountain vicinity on 5 June 1980. All nest locations were either occupied by Rough-legged Hawks and Common Ravens, or were found to be unoccupied.

Yukon River Drainage

Yukon River

We surveyed a large section of the Yukon River course below Fort

Hamlin for Peregrine Falcons twice during the 1980 breeding season as part of a separate non-NWA project. One trip was made in June and one trip was made in July. The nearest location occupied by peregrines upstream of the proposed NWA gas pipeline crossing was at Location 92.1, about 13 miles upriver. That pair failed in their attempt to nest. The nearest occupied location downstream of the proposed crossing point was at Location 97, about 5 miles downriver where the pair of peregrines reared two nestlings to near fledging age. Location 97 was not occupied by peregrines in 1979, and Location 92.1 was occupied by an unsuccessful pair that year (Springer *et al.* 1979, Roseneau and Bente 1979).

Elliott Highway

Grapefruit Rocks

The first year we know of that Peregrine Falcons nested at Grapefruit Rocks was 1979. That year a pair was discovered by us on 2 June at Location 86 (Roseneau and Bente 1979). The pair nested successfully in spite of a large amount of construction activity associated with re-building the Elliott Highway. We were unable to obtain follow-up data at that location ourselves in 1979, but we did receive important information with regard to that nest site at a later date from R. Ambrose, USWFS, (personal communication, September 1979). Some of that information was received too late to include in our 1979 report. We report all those data from Ambrose here along with our 1980 results of surveys in that area.

On 23 July 1979 three peregrine nestlings were found and banded at a nest ledge at Location 86. The nestlings were estimated to be about 18 days old on that date, about 10-14 days younger than most interior Alaskan nestlings at nest sites on the Yukon River. The age of the young indicated somewhat later initial breeding and egg laying by this pair of peregrines.

Heavy construction work on the Elliott Highway, about 0.4 miles downslope and in sight of the nest ledge, commenced in late April 1979. Work in an Alaska Department of Transportation (ADOT/PF) gravel pit on the upslope side of the highway below the nest location commenced on about 25 April 1979, near the average date peregrines are first seen in interior Alaska in most years. As a consequence, heavy construction activities, including blasting, commenced at the borrow pit about the same time the peregrines arrived in the area. On about a weekly basis during the course of the summer, and until early September, about 10,000 to 16,000 pounds of dynamite were exploded at the ADOT/PF gravel pit. These charges were close enough that both high levels of noise and concussion were experienced by the peregrines at the nest site. In at least one instance Ambrose observed a concussion wave literally knock the adult male off of his perching place. He returned in a few minutes. On 7 September 1979, two of the three young were observed flying about the nest site and a third young was also thought to be in or near the nest or in the vicinity of it.

We resurveyed the Grapefruit Rocks area in 1980. The 1979 nest site at Location 86 was unoccupied; however, a pair of peregrines was observed near other rock outcrops farther to the north in June. On 23 July that pair was still present and had successfully reared three nestlings to fledging age at this new location (Location 88.1). Fledging dates for all three nestlings were estimated to be about 26-28 July. Location 88.1 is well hidden from the nearby road, and is about 0.75 miles northwest of Location 86.

Tanana River Drainage

Tanana River

Four pairs of Peregrine Falcons were present at nesting locations on the Tanana River in 1980. Three of these pairs occupied Locations

21a, 29b and 73b, all occupied by pairs of peregrines in 1979, and all considered historical nest sites (Roseneau and Bente 1979). The fourth pair occupied Location 52, occupied by Common Ravens in 1979. That location has no history of use by peregrines. No other Peregrine Falcons were observed along the Tanana River in 1980.

During the June survey of this river course, only two pairs of peregrines were located by us. These pairs, although not particularly obvious, were easily found at Locations 21a and 29b, and both pairs gave evidence that they were successfully nesting at them. During the July survey we confirmed that the peregrine pairs at Locations 21a and 29b had both successfully fledged nestlings. Two juveniles were observed flying about at Location 21a and three were flying with the adults at Location 29b. Pairs nesting at both these locations had also successfully fledged nestlings in 1979 (Roseneau and Bente 1979). All five juveniles observed on 26 July (Location 21a) and 27 July 1980 (Location 29b) were estimated to have fledged about 16-10 July, possibly even a few days earlier.

During the July survey of the Tanana River, two additional pairs of peregrines were discovered. One pair had attempted to nest at Location 52, and one pair had attempted to nest at Location 73b. Both pairs had failed in their attempts to nest, and all evidence suggested failure occurred early in the nesting cycle.

The pair of peregrines at Location 52 was present on our arrival at the cliff on 28 July. Both birds left the area shortly after taking flight. The adult female had been attending an empty scrape about 30-36 inches back in a small, deep (estimated 7-8 feet), triangular hole. Early nesting failure coupled with wind and rain in this section of the river during our June survey probably prevented discovery of this location at that time.

The presence of peregrines at Location 73b was also not discovered during the June survey, in spite of almost three hours of observation. Furthermore, ground searches in the area failed to find any evidence, such as molted feathers or prey remains, to indicate that falcons were utilizing the cliff. All three old Common Raven nests were checked with a spotting scope and clearly did not contain incubating birds. On 29 July an adult male and an adult female were perched on the cliff-top. They were silent, non-aggressive and both disappeared from the area shortly after taking flight. A search of the cliff on foot located a single, abandoned, bleached peregrine egg in one of the three Common Raven nests. A nesting failure had occurred early in the nesting cycle at this same location in 1979 (Roseneau and Bente 1979). We suspect the same pair was involved both years.

Salcha River

During the surveys of the Tanana River, we also checked for the presence of Peregrine Falcons at the cliffs and bluffs of the Lower Salcha River downstream of the TAPS crossing. No peregrines were observed during the surveys and no eveidence of recent use by them could be found at any of the locations.

DISCUSSION

We have previously discussed the proposed NWA gas pipeline route and its location with respect to Peregrine Falcon nesting habitat in Alaska (Roseneau and Bente 1979). All areas of important nesting habitat that occur near the proposed gas pipeline route received survey coverage in 1980.

Sagavanirktok River Drainage

In the Sagavanirktok River drainage, the one area of important nesting habitat near the proposed alignment north of the Brooks Range, the number of peregrines present in 1980 declined slightly, compared to 1979. In 1979, four pairs were present in the Sagavanirktok River drainage, two at Sagwon Bluffs (Locations 194 and 211), and two (Locations 220 and 223) at Franklin Bluffs (Roseneau and Bente 1979). In 1980, only three pairs were confirmed present, two at Franklin Bluffs again (Locations 218.1 and 220), and one near the northern terminus of Sagwon Bluffs (Location 211). No peregrines occupied the southern end of Sagwon Bluffs this year. However, one single adult was observed between there and Happy Valley Camp in a section of the drainage with relatively little nesting potential. That bird could have been a member of the unsuccessful pair that occupied Location 194 in 1979, or it could have been another, as yet, unmated individual.

The productivity of peregrines nesting in the Sagavanirktok River drainage in 1980 was probably lower than in 1979. We can confirm the presence of only two fledged juveniles (Locations 220). Data on the outcome of the nesting attempt at Locations 211 was not obtained by agency personnel. One of the two pairs inhabiting Franklin Bluffs failed entirely (Location 218.1). In fact, from that pair's behavior in early June, we doubt they even laid eggs. We believe that failure was the result of local weather-related conditions in the spring. The

extremely wet conditions found in many of the snow-free zones of the bluff face, and the extensive, deep snow drifts that still covered other large areas as late as 6 June, severely limited the available nesting habitat. We make the assumption that the pair of peregrines nesting at Location 223 in 1979 survived and successfully completed the fall migratory, winter and spring migratory periods of their yearly life cycle. If that assumption is correct, we have every reason to believe that the same pair probably returned to the vicinity of nesting Location 223 in the spring of 1980. A pair of peregrines returning to Franklin Bluffs this spring would have found almost all potential nest sites on the bluff face covered with snow. A pair of peregrines that returned to Location 220 at about the same time, however, would have found that nest site snow-free and relatively dry due to its reversed, east-facing exposure. We suggest that the non-breeding pair of peregrines found wandering along the bluff face south of Location 220, and still displaying some behavior normally associated with earlier courtship activities and nest site selection at Location 218.1 on 5-6 June, was the result of an inability to locate a useable nest site anywhere near Location 223. By the time they attempted to locate, or could locate a suitable and available location along the west-facing bluffs farther to the south, it was too late in the normal physiological sequence of reproductive events to successfully iniate actual reproduction.

Similar weather related conditions did not appear to affect the Sagwon Bluffs area to the extent they may have in the more northernly located Franklin Bluffs area. We believe other factors, including possible adult mortality and pollutant residue contamination, are more likely candidates that could help explain the absence of peregrines at Location 194, and the presence of a single peregrine near there.

Yukon River Drainage

The numbers and productivity of Peregrine Falcons inhabiting the Yukon River drainage between Fort Hamlin and Tanana increased markedly

from levels recorded in 1979 (Springer *et al.* 1979, Roseneau and Bente unpublished field notes). The increases observed in 1980 were part of a more wide-spread upward trend throughout much of the Yukon River drainage that has been occurring for the last several years (Springer *et al.* 1979, R. Ambrose unpublished data, Roseneau unpublished field notes). That upward trend in many of the interior Alaska subpopulations is probably responsible for the occupancy of a new peregrine nesting location downstream of the Yukon River bridge in 1980. That location (Location 97) has no documented history of past use by this species. Only one documented nesting location occurs between Location 97 and Location 92.1, about 13 miles upriver of the TAPS crossing. That location (Location 95a, Roseneau and Bente 1979) has remained unoccupied for the past several years (Springer *et al.* 1979). If the subpopulation of peregrines nesting in the Yukon River drainage continues to increase as it has in 1979 and 1980, however, other locations between the TAPS crossing and Location 92.1 could possibly become occupied in the near future. We suggest that the possibility of such an event should be anticipated.

Elliott Highway

Some of the information obtained from the Grapefruit Rocks Peregrine Falcon nesting locations in 1979 suggest human activities could have delayed the pair's reproductive attempt that year. Almost all other peregrine pairs known to have nested in interior Alaska in 1979 were about two weeks more advanced in their nesting cycle, and on what appeared to be a normal phenological schedule. Each year, however, a few Alaskan pairs are out of syncrony with the remainder of the nesting population. As a consequence, there may have been other reasons for this pair's somewhat late nesting schedule.

We were encouraged that a pair of Peregrine Falcons returned to successfully nest again at Grapefruit Rocks. We assume that the same pair returned in 1980, and we can only speculate that the intense activities

near the nest location used by them in 1979 (Location 86) caused them to choose a new location about 0.75 miles farther away from the road in 1980 (Location 88.1).

The events that occurred in 1979 at the Peregrine Falcon nesting location at Grapefruit Rocks suggest that some peregrines may be amazingly tolerant to some kinds of major disturbances on their breeding grounds. Human activities such as continued blasting operations in close proximity to a nest site usually would be expected to have detrimental effects on any reproductive efforts. These data do not, however, suggest that all peregrines on their breeding grounds are capable of tolerating and successfully 'weathering' such major kinds of human activities. These data, other data on wintering peregrines in South American cities (e.g. Roseneau and Springer unpublished field notes, C. White unpublished field notes, H. Albuquerque in preparation) and data on breeding peregrines along the lower Yukon River, Alaska, (Springer *et al.* 1979, Roseneau and Bente unpublished field notes) do, however, suggest that some proportion of the population is capable of successfully adapting to a variety of human activities and man-made environments in some circumstances.

Tanana River

Little change occurred in the total number and productivity of Peregrine Falcons inhabiting the Tanana River drainage upstream of Fairbanks between 1979 and 1980. In 1979, three pairs and probably as many as three unpaired individuals were present at locations along the river course, but only two of the pairs nested successfully and fledged a total of four young birds (Roseneau and Bente 1979). In 1980 four pairs of peregrines were present, but again only two of those pairs nested successfully, and produced five young birds that fledged.

Even though a pair occupied a new nesting locatin in 1980 (Location 52), the data are not particularly encouraging; in 1978 a fourth pair was also present at another cliff, but that location has remained unoccupied

since that breeding season.

It appears that this interior Alaska subpopulation is still only barely maintaining itself, even though most other interior Alaska subpopulations have exhibited marked increases in both total numbers and productivity since about 1976. In fact, that upward trend continued throughout the Yukon River drainage in 1980, with the principal exception of the Tanana River system (D. Roseneau, A. Springer and P. Bente unpublished data; R. Ambrose unpublished data).

Peregrines nesting on the Tanana River in 1980 appeared to be about 7-10 days ahead of the average phenological schedule. Usually most fledging occurs during about the last week of July. The advanced phenology observed on the Tanana River this year was not exclusive to that area, however. Peregrines also nested about one week ahead of their 1978-1979 schedules on the Yukon River between Stevens Village and St. Marys (Roseneau and Bente unpublished field notes). In general, earlier nesting dates for peregrines in 1980 appeared to be a state-wide phenomenon.

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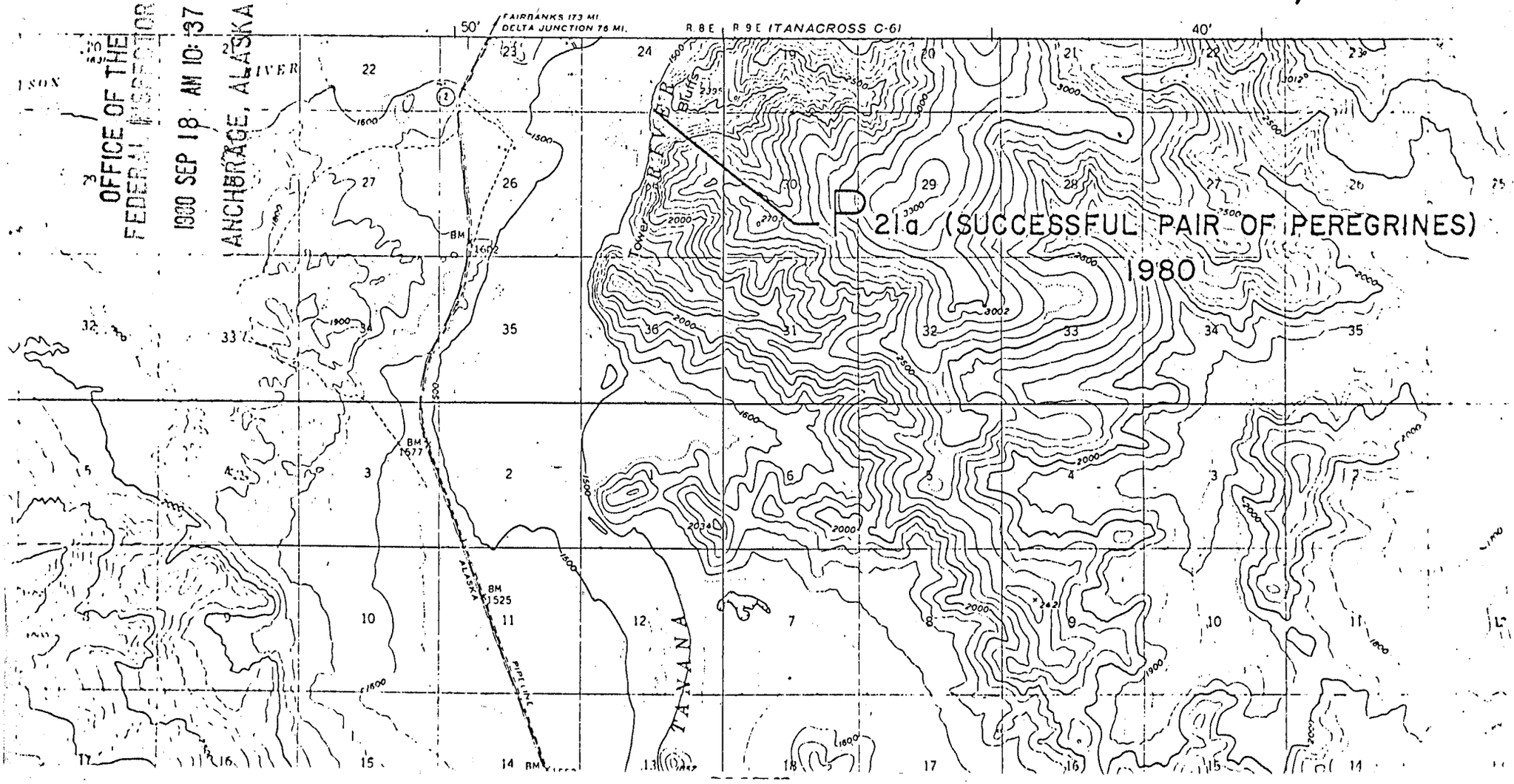
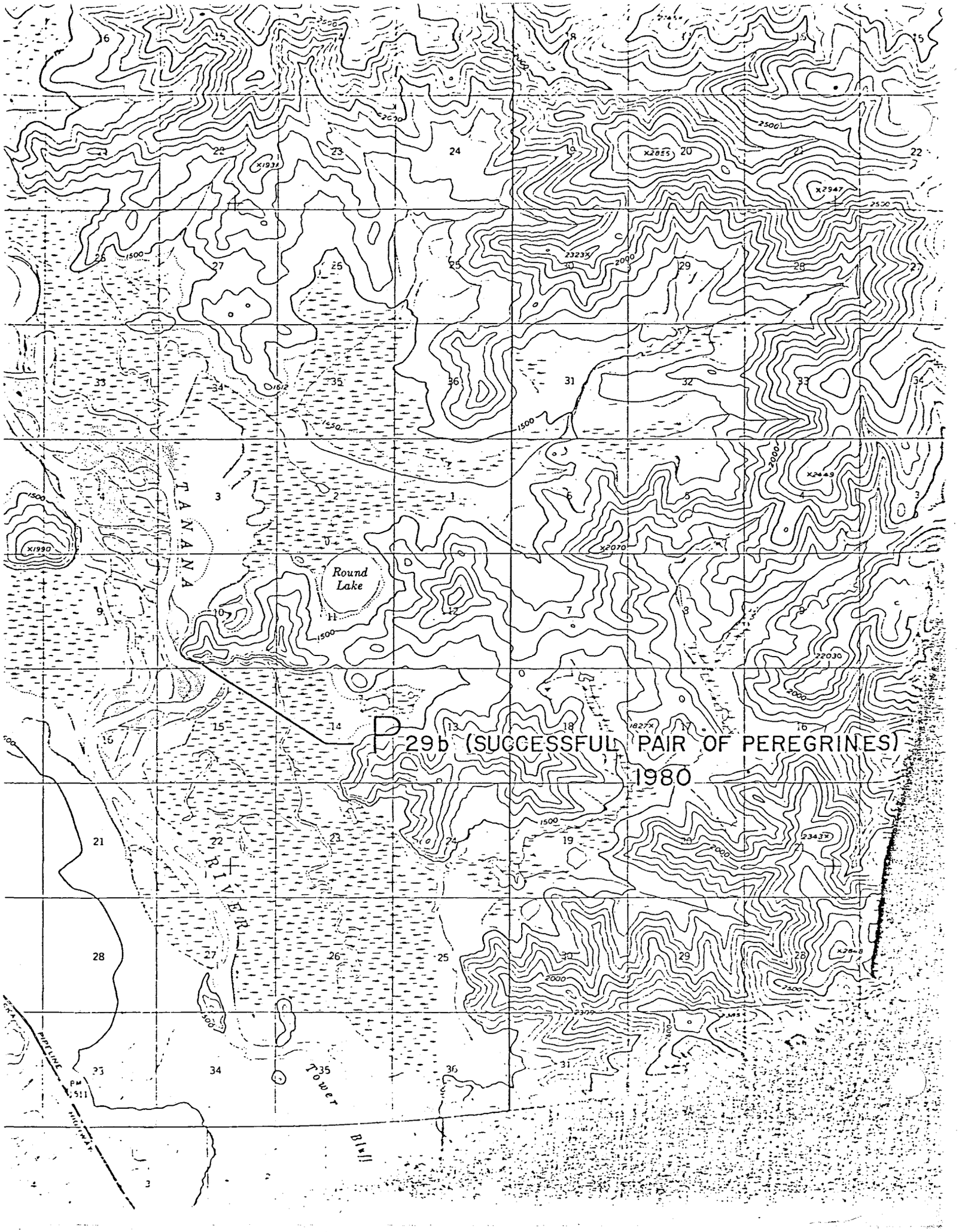
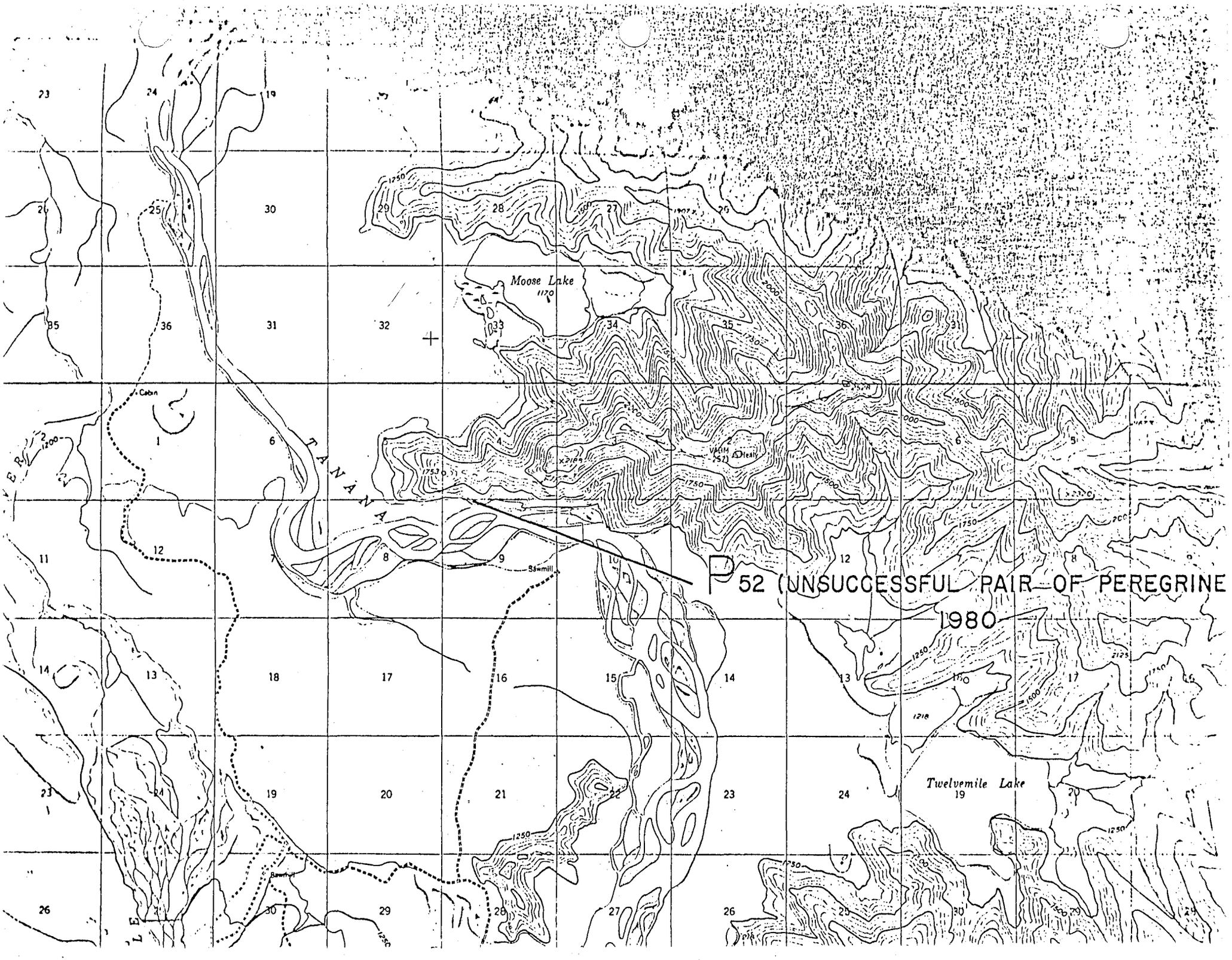
Biological Working Group
Technical Papers
Confidential//Prop.

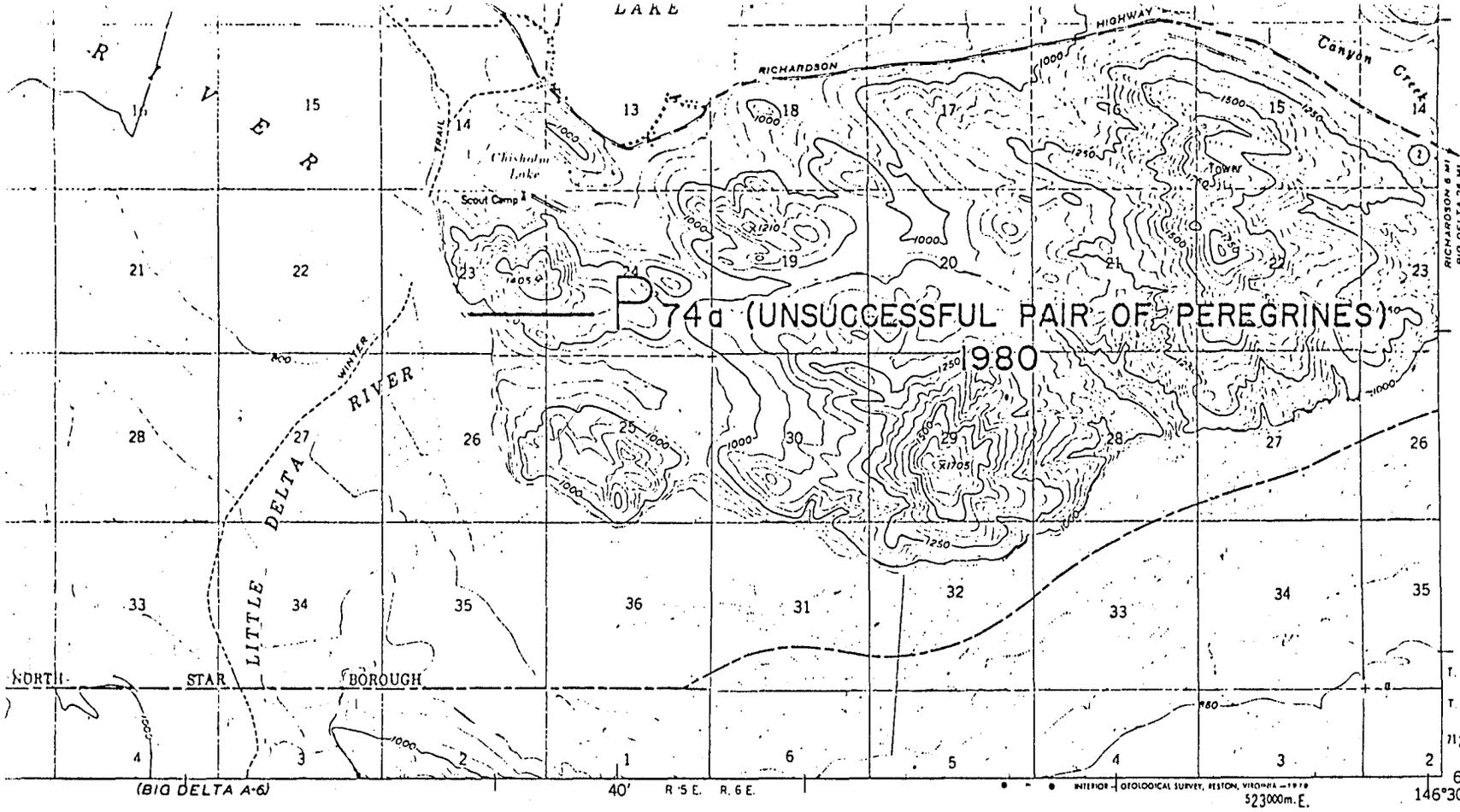
PRELIMINARY MAP

ERIOR




P29b (SUCCESSFUL PAIR OF PEREGRINES)
1980
Round Lake
TANANA
RIVER
PIPELINE
Tower
Bluff


Moose Lake
1170
TANANA
Cabin
Sawmill
Twelvemile Lake
P52 (UNSUCCESSFUL PAIR OF PEREGRINE
1980



SCALE 1:63360

1 2 3 4 MILES

1000 6000 9000 12000 15000 18000 21000 FEET

1 2 3 4 5 KILOMETERS

CONTOUR INTERVAL 50 FEET
DOTTED LINES REPRESENT 25 FOOT CONTOURS
DATUM IS MEAN SEA LEVEL

ROAD CLASSIFICATION

Medium-duty ——— Light-duty ———

Unimproved dirt - - - - - -

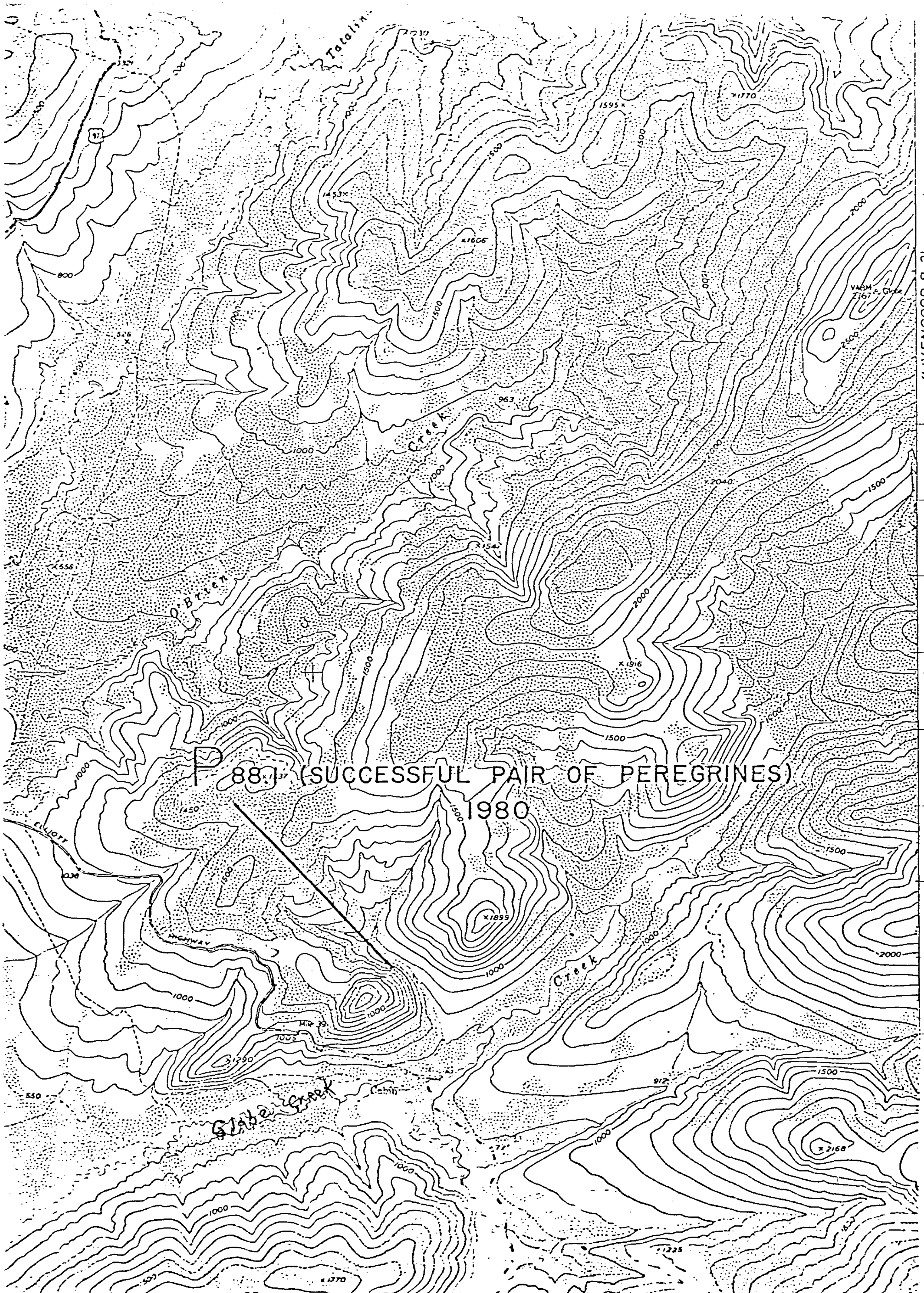
State Route

QUADRANGLE LOCATION

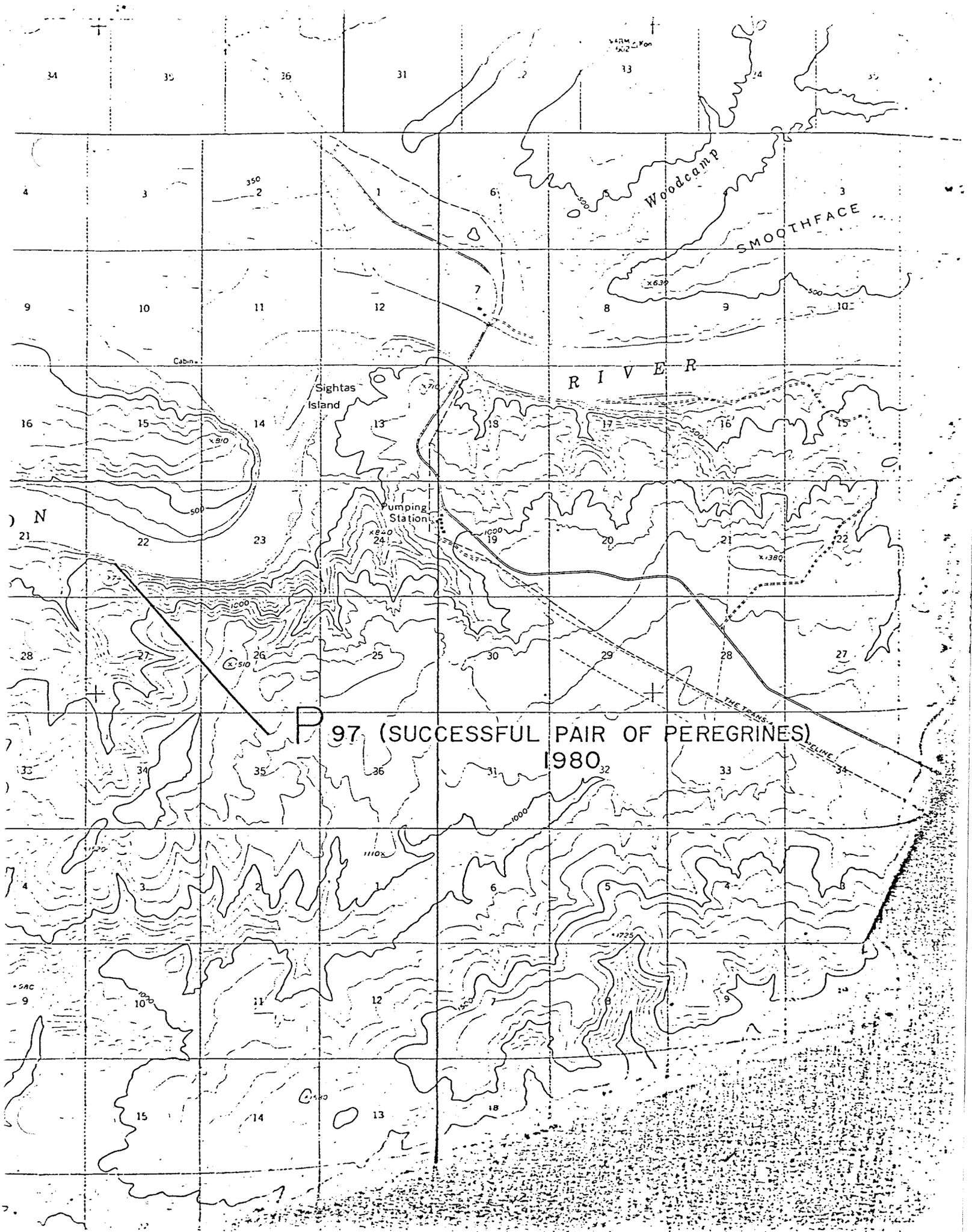
BIG DELTA (B-6), ALASKA
N6415-W14630/15X30

1949
PHOTOREVISED 1975

FOR SALE BY U.S. GEOLOGICAL SURVEY
ASKA 99701, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
DER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST



Alignment sheet probably 74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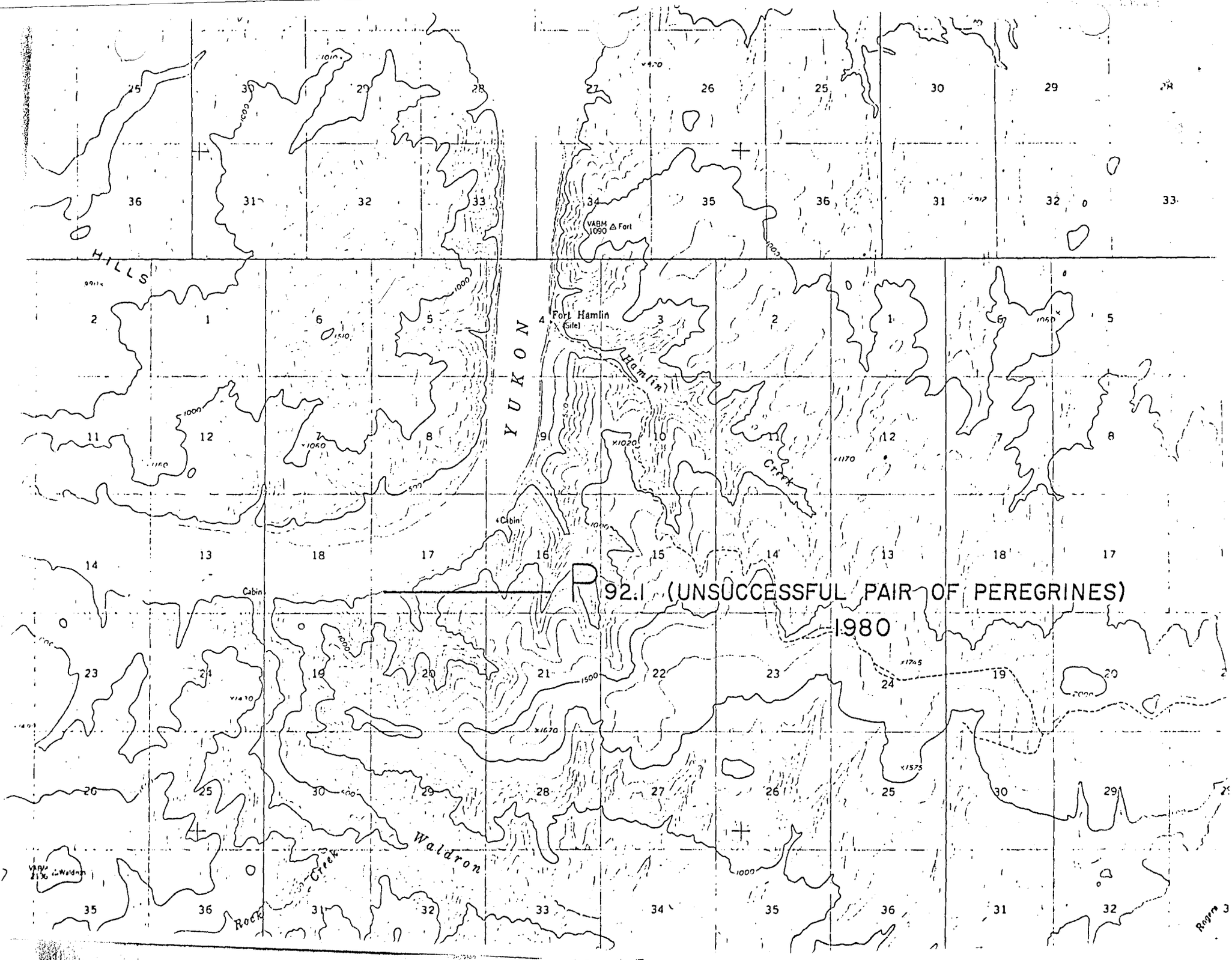
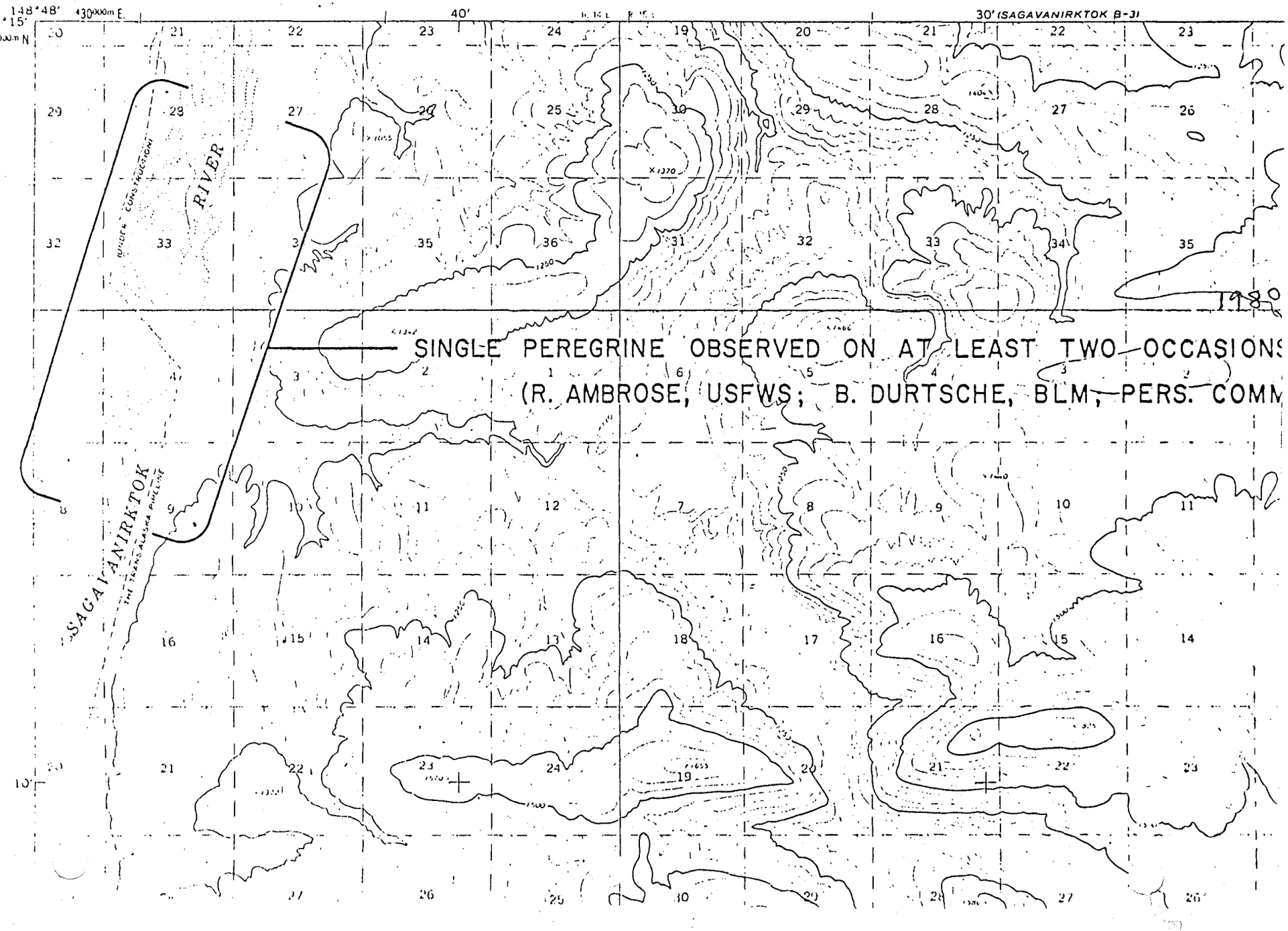
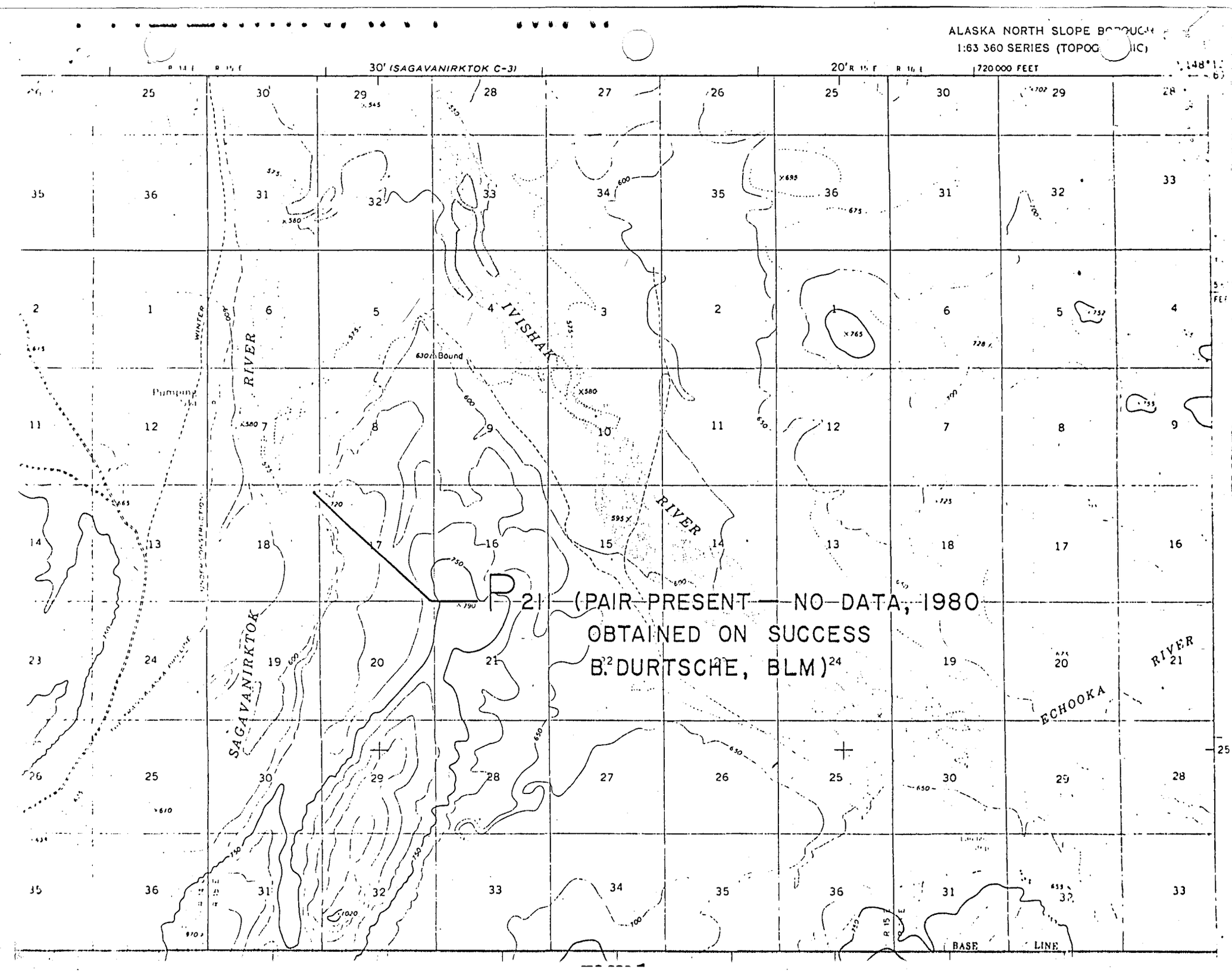
RIVER
Sightas Island
Pumping Station
THE TRANS-ALASKA PIPELINE
P 97 (SUCCESSFUL PAIR OF PEREGRINES) 1980

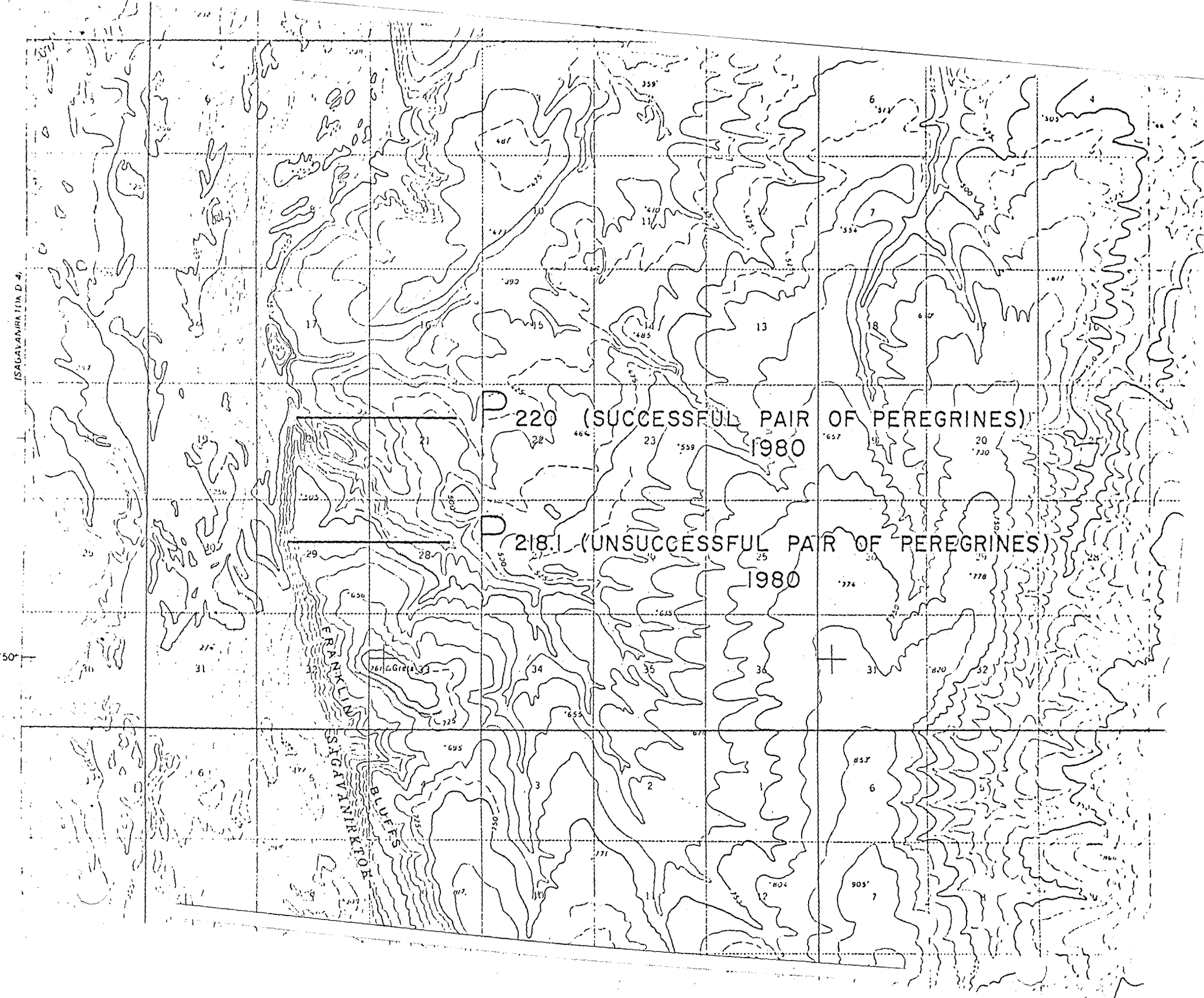

HILLS
YUKON
Fort Hamlin
(Site)
Hamlin
Creek
Cabin
Cabin
Waldron
Rock Creek
VABM
1090
Fort
P 92.1 (UNSUCCESSFUL PAIR OF PEREGRINES)
1980

PRELIMINARY MAP

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY




ALASKA NORTH SLOPE BOROUGH
1:63 360 SERIES (TOPOGRAPHIC)
30' (SAGAVANIRKTOK C-3)
720 000 FEET
WINTER
RIVER
IVISHAK
RIVER
SAGAVANIRKTOK
RIVER
ECHOOKA
RIVER
BASE
LINE
P-21 (PAIR PRESENT — NO DATA, 1980
OBTAINED ON SUCCESS
B. DURTSCHE, BLM)


ISAGAVANIRKTOK D 4
P 220 (SUCCESSFUL PAIR OF PEREGRINES)
1980
P 218.1 (UNSUCCESSFUL PAIR OF PEREGRINES)
1980
FRANKLIN BLUFFS
ISAGAVANIRKTOK
50