

A Survey for Nesting Birds of Prey
Along the Copper River, Alaska,
1987/88.

Key Words: Copper River, Raptors, Bald Eagles,
Birds of Prey, Endangered Species, Birds.

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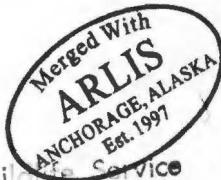
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INTRODUCTION

Since 1979, the Endangered Species Division of the U.S. Fish and Wildlife Service in Alaska, in cooperation with other land managing Federal agencies and private contractors, has conducted annual nesting population surveys of Arctic and American Peregrine Falcons (Falco peregrinus tundrius and F. p. anatum). Rivers where concentrations of peregrines are known to occur and which are surveyed annually include the Colville, Sagavanirktok, Yukon, Porcupine, Charley, Tanana, and Kuskokwim. In addition to these study areas, surveys have been conducted in numerous other areas when potential resource conflicts, obvious data gaps, or other informational needs have arisen.

From its source in the Copper and Tanada Lakes of the Wrangell Mountains, the Copper River flows approximately 500 kilometers (300+ miles) through eastern, southcentral Alaska and the Chugach Mountain Range and empties into the Gulf of Alaska near Cordova. It is the largest glacial river in southcentral Alaska. With an average discharge of 37,000 cubic feet per second, the U.S. Geological Survey describes the Copper as one of the larger rivers in the United States (U.S. Department of the Interior. Alaska Planning Group. 1973. Final Environmental Statement, Proposed Wrangell - St. Elias National Park, Alaska).

Despite these statistics and ready accessibility from the Glenn and Edgerton Highways, the Copper River corridor has received very little attention from biologists interested in nesting birds or prey. This was probably due to the scarcity of habitat for cliff nesting raptors in the upper and middle reaches of the river and the absence of any large scale proposed development projects. Nonetheless, development is occurring within the Copper River Valley, and the long running debate about constructing a road to Cordova continues today with the recent appropriation of \$300,000 in federal highway money to update previous planning efforts. The Alaska Power Authority has also expressed interest in the water and power resource potential of the Copper River. Their studies established that Wood Canyon below Chitina is one of the four or five most important potential hydroelectric sites in Alaska. Lastly, the U.S. Air Force is planning the construction of one unit of an over-the-horizon radar system near Gulkana. This project will likely require large amounts of gravel (probably from the riparian corridor) and will have a noticeable affect on the demography and rate of land development in the upper Copper River area.

The primary objectives of this study were as follows:

1. identify nesting locations for birds of prey in the river corridor,
2. determine the status of nest sites encountered,
3. band young where possible,
4. obtain physical data on all nest sites encountered,
5. identify prey remains found in and near nest sites, and
6. make the information obtained available to other federal, state, and private land managing agencies to promote the conservation of raptors along the Copper River.

STUDY AREA

The study area extended from the Batzulnetas Trail south of the Nabesna Road to the northern end of Long Island at the Copper River Delta near Cordova, a distance of about 290 miles (Figures 1 and 2). Elevation at the onset of the survey was 2,400 feet above sea level. The Copper River above Chitina resembles other braided, glacial interior Alaska rivers but changes markedly at Wood Canyon, where the river bisects the Chugach Mountain Range and exposes considerable rock cliff habitat.

METHODS

An arctic tern was used to conduct an aerial reconnaissance of the Copper River between Chistochina and Chitina on June 25, 1987. On July 6, 1987, two observers began a single trip downriver from the confluence of the Chistochina River with a Mark II Zodiac, equipped with oars and a 25 hp outboard motor. Due to the shallow, braided nature of the river, the motor was only used to run back up river short distances or to travel from bank to bank across heavy current. It was also helpful in negotiating rapids below Chitina and for crossing expanses of slack water such as Miles Lake. An Avon redshank raft was used to survey the upper portion of the Copper River from the Batzulnetas Trail to Chistochina on July 28 and 29, 1988.

The survey was conducted by two observers with standard variable power spotting scopes and binoculars. The location of all raptors and raptor nest sites were plotted on USGS 1:250,000 scale topographical maps.

An Alvin map measurer was used to determine the location in kilometers (km) of raptor nest sites from the headwaters of the river. For example, 96 km refers to a location 96 km downriver from the headwaters of the main stem of the Copper River. This method of labeling nesting locations allows for sequential coding of an infinite number of locations.

Tree and nest heights were measured with a Suunto clinometer and diameter at breast height (dbh) was obtained with a dbh tape. Nest sites were accessed using tree spikes and standard climbing equipment. The age of nestlings was estimated by comparing relative body size and feather development with photographs of known-age young. A nest was considered active when fresh grass or twigs, eggs or shell fragments, accumulations of fresh white wash, prey remains, nestlings, or defending adults were observed. As we were present only during a 10-day period in 1987 and two days in 1988, we were not able to assess fledging success for most sites.

RESULTS

Peregrine Falcons

No peregrine falcons or other cliff nesting raptor species were observed during the survey. Suitable cliff habitat is scarce above Chitina, with the few major cliffs present composed of highly erodable and unstable sandstone. Although several of these bluffs had favorable southern or southeastern exposures, few if any ledges were evident on the cliff faces. Below Chitina, the river exposes considerable rock cliff habitat that appears suitable for nesting by falcons. The absence of nesting falcons along the river corridor could be related to the surrounding mountainous terrain and general lack of

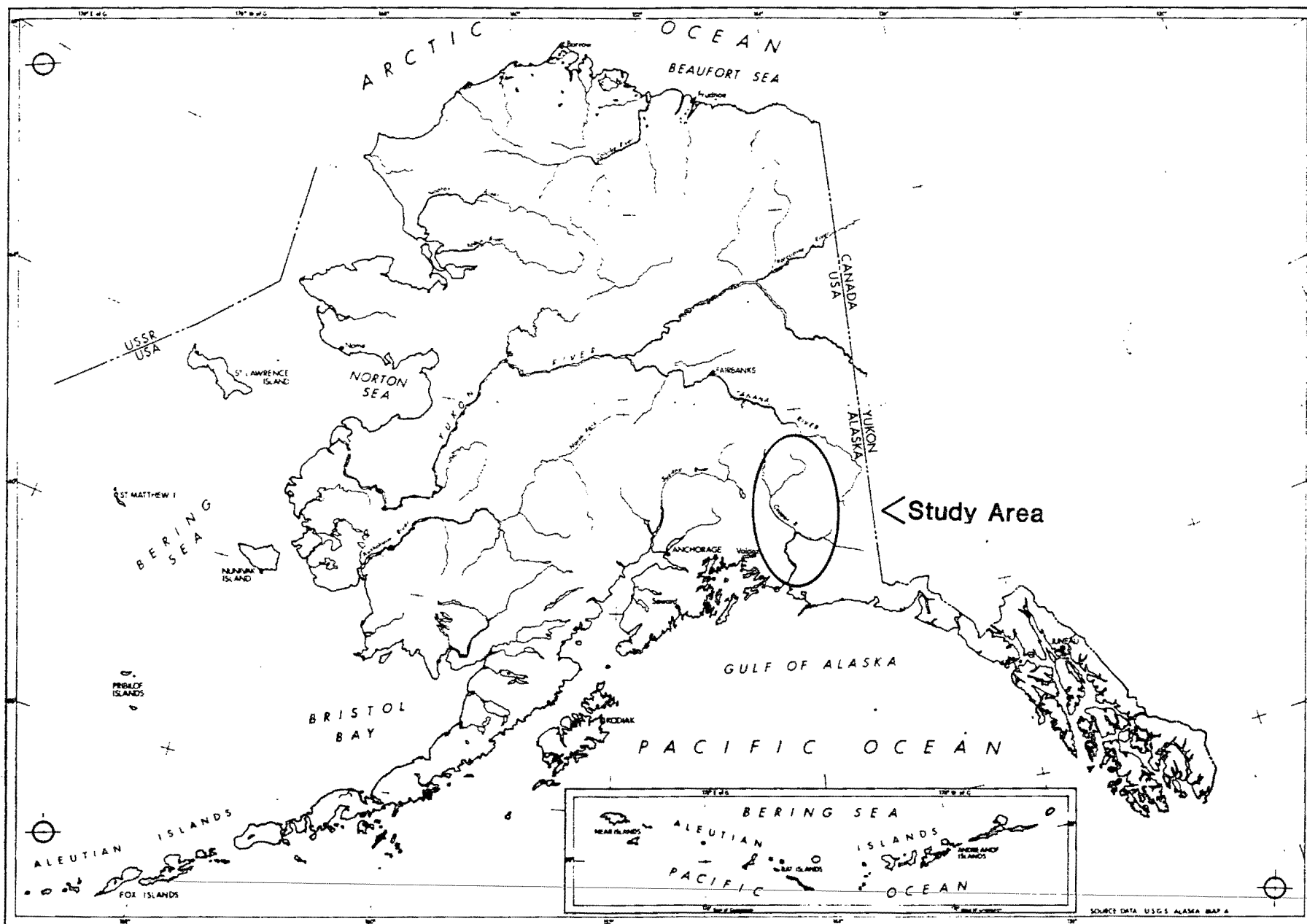


Figure 1. Location of the Copper River in Southcentral Alaska.

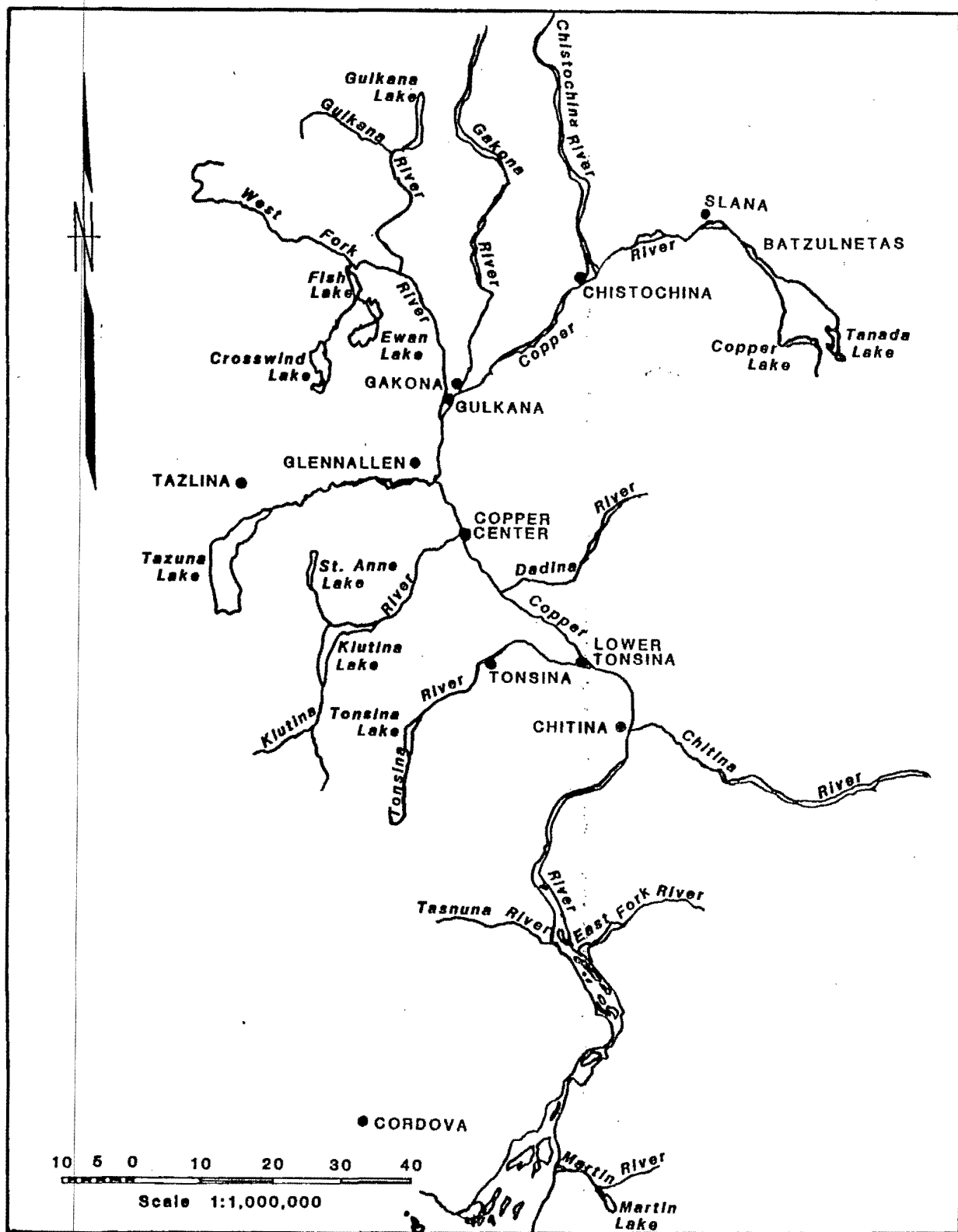


Figure 2. Location of the Copper River Study Area, Alaska.

wetlands and lakes that are associated with other rivers like the Yukon and Tanana that do support notable peregrine populations.

Jeff Shryer of the Bureau of Land Management reported observing a pair of peregrine falcons adjacent to the study area in August 1987. The pair was observed on the Chitina River, several miles from its confluence with the Copper River. Nesting is suspected.

Bald Eagles

The riparian habitat along the Copper River supports a major breeding population of bald eagles (Haliaeetus leucocephalus). Eagles and eagle nests were encountered regularly during the length of the survey. A total of 67 bald eagle stick nests were observed during our work which did not include the upper river above the Batzulnetas Trail or most of the fertile habitat of the delta. A more comprehensive survey would undoubtedly reveal many more nesting territories. Of the 67 stick nests observed, 31 (46%) showed signs of being active during the study. Of this number, 16 (52% of active nests or 24% of total nests observed) contained a total of 24 eaglets. Six eaglets were banded with U.S. Fish and Wildlife Service metal bands.

By far, balsam poplar or cottonwood (Populus balsamifera) was the most common tree species utilized for nesting, with white spruce (Picea glauca) a distant second in importance (Table 1a). Nearly all cottonwood nest trees were living trees.

Table 1a. Species and Characteristics of Trees Used by Nesting Bald Eagles along the Copper River, Alaska.

	Number of Eagle Nests	%	TREE STATUS						
			Total	Live	Dead	?	Top		
							Live	Dead	?
Cottonwood <u>Populus balsamifera</u>	52	78	49	2	1	22	21	9	
White Spruce <u>Picea glauca</u>	13	19	10	3	0	8	5	0	
Quaking aspen <u>Populus tremuloides</u>	1	1	1	0	0	0	1	0	
Cottonwood - Q. aspen hybrid	1	1	1	0	0	1	0	0	
Unknown	1	1							

Of 10 bald eagle nests observed upriver from the confluence with the Chistochina River, six were in white spruce trees. The typical nest tree along the middle and lower Copper River was a mature cottonwood, about 20 meters in height and 50 cm (20 inches) dbh, located either on an island in the

river or in close proximity to the water on either bank (Table 1b). Although the mean distance to water was 22.5 m for some 40 nest trees measured, several nests were found that were greater than 100 m from the river's edge. Twelve of 25 active nests in cottonwood trees were successful (i.e., large young were present), while one of five active nests in white spruce contained young. A dead eaglet, approximately seven weeks in age was found below the nest at 48 km. We presumed the mortality resulted from an accidental fall from the nest.

Four bald eagle nests that had fallen from their perches in cottonwood trees were found and examined. Two of these were extremely large accumulations of sticks, and were lined with sphagnum moss and grasses. They measured approximately 203 cm long (6 feet 8 inches) and were about 112 cm wide (3 feet 8 inches) wide. In two cases the nests had fallen from the trees that supported them, while in two other cases, the top of the tree could no longer support the weight of the nest, snapped, and fell to the ground with the nest.

Initially, it appeared that eagles were selecting cottonwoods that had dead branches in their crowns. However, an equal number of cottonwood nest trees had fully living crowns. Cottonwoods are no doubt the preferred tree species because of their size, availability, proximity to water, and shape which usually includes major branching two thirds of the way up the trunk -- an ideal location for the construction of a nest. The tendency for many mature cottonwood trees to have dead branches in their crown increases visibility from the nest, provides a perch site, and facilitates flight into and from the nest. Lacking major forks or extensive horizontal branching, white spruce are usually only available to eagles for nesting when an anomaly such as a witches broom rust (Chrysomyxa arctostaphyli), missing branches in the crown, or a broken crown provides a platform or space upon which to construct a nest.

Both spruce and cottonwood trees along certain sections of the river were exposed to east winds and appeared vulnerable to blowdown. This was particularly evident about 16 km (10 miles) upriver from Gakona. Beavers were also observed felling cottonwood trees, some of which were of considerable size (base diameter 47 cm or 18.5 inches). Although some trees were felled within a few meters of cottonwood nest trees, no nest trees examined showed signs of having been gnawed by beavers.

The Copper River parallels the Glenn, Richardson, and Edgerton Highways for a distance of about 270 km (168 miles). This provides the opportunity to evaluate eagle nest locations and status in relation to the road system. Of the 48 nests that occur along the portion of the river that parallels the road (Slana to Chitina), slightly more than half (25) were on the road side, while 23 were on the opposite side. However, a higher percentage of the nests opposite the road were active (8 of 22, 36%) than were the nests between the river and the road (6 of 26, 23%).

On average, there was an active eagle nesting territory every 15 km along the river. Some active nests were as far as 37 km from their nearest neighbor, while 1 km (across river) was the closest two pairs were observed nesting. Appendix A indicates locations for nest trees identified during the survey. Due to the difficulty of determining precise locations along the river corridor, nest locations should be considered approximate.

Considering that our survey did not include the upper 48 km (30 miles) of the river and that we could only survey a small percentage of the habitat present

on the delta, we undoubtedly missed a substantial number of eagle nests. If the nesting densities, and per cent of nests active and successful during the 1987/88 survey are representative of the habitat not surveyed, I estimate the total nesting bald eagle population for the river from headwaters to delta (excluding tributary streams) would be 75-100 total stick nests, about 35-40 active territories -- with perhaps, 15-30 pairs successfully producing young. With eagle nesting data compiled for the Gulkana River system (M. McWhorter, pers. comm.), the Copper River drainage conservatively contains 100 bald eagle nesting territories. This is a significant eagle population for an interior, southcentral Alaska river.

Over 125 eagle observations were made during the 12 days spent on the river in 1987 and 1988. Seventy-two percent of the bald eagles observed were mature birds in adult plumage, 21 percent were immature birds with mostly brown mottled plumage, and seven percent had considerable white feathering and were regarded as sub-adults.

Although there is no historic data on the Copper River raptor populations, development to date has probably had only a minimal impact on the bald eagles nesting in the river corridor. Mature cottonwood trees and to a lesser extent white spruce, particularly those near gravel bars where salmon wash up are critical to the eagles, both as nest sites and hunting perches. Land managers and planners should allow as wide a buffer as possible around these areas in order to promote the conservation of this species. Although the salmon in the Copper is currently considered an under utilized fishery, allocators of this resource should consider that the eagle population is dependent on salmon for their summer and fall survival.

Prey Remains

We searched for prey remains in the 10 nests we accessed, as well as on the ground below each nest. Prey remains were not abundant, hence no effort is made to identify frequency of occurrence or otherwise quantify them in any way. A list of remains that could be identified is as follows:

MAMMAL	FISH	BIRD
Snowshoe hare	Red salmon	Canada goose
Domestic dog	King salmon	Common snipe
(probably scavenged)		Mew gull

Other Raptors

Dark phased red-tailed hawks (Harlan's hawk) (Buteo jamaicensis harlani) were the second most common raptor species observed during the survey. Harlan's hawks were observed at 98 km (single bird in flight), 152 km (pair vocalizing), 202 km (single bird perched), 210 km (single bird vocalizing), 216 km (single bird in flight), and 242 km (single bird perched). No attempt was made to locate the tree nests for this species. Interestingly, no Harlan's were observed below Chitina, where the character of the river changes, the climate is wetter, and the riparian corridor more limited. A single sharp-shinned hawk (Accipiter striatus) was observed at 360 km. No other raptors were observed. Raven (Corvus corax) nests were obvious on several bluffs along the river. Several appeared active in 1987, but as young had already fledged by July, no other information was obtained. Table 2 lists all bird species observed along the river during the survey.

TABLE 1b. Physical Data on Nests and Nest Trees, Copper River, Alaska.

	Tree Height (m)	Tree DBH (cm)	Nest Height (m)	Nest	
				Dia. (cm)	Depth (cm)
1. <u>Cottonwood</u>					
Mean	19.5	50.7	14.8	141.15	85.43
Range	12.2-30	26.3-113.2	7.6-25	40.6-	30.5-
N = 35				243.8	183
2. <u>White Spruce</u>					
Mean	21.2	54.1	18.3	92.5	48.8
Range	13.5-27.4	41.4-72.2	11.0-27.0	45.7-127	35.6-61
N = 11					
3. <u>Quaking Aspen</u>	10.6	27.5	9.6	183	33
N = 1					
4. <u>Aspen-Cottonwood</u>					
Hybrid	19.5	56.6	13.5		121
N = 1					
5. <u>All Species/Metric + English Units</u>					
Metric					
Mean	19.8	48.3	15.0	137.1	81.3
Range	10.6-30	26.3-113.2	7.6-27.0	40.6-	30.5-
				243.8	183
English					
Mean	65'	19"	49'3"	4'6"	2'8"
Range	34'9"-98'4"	10"-3'9"	24'11"-88'6"	1'4"-8'	1'-6'
N = 48					

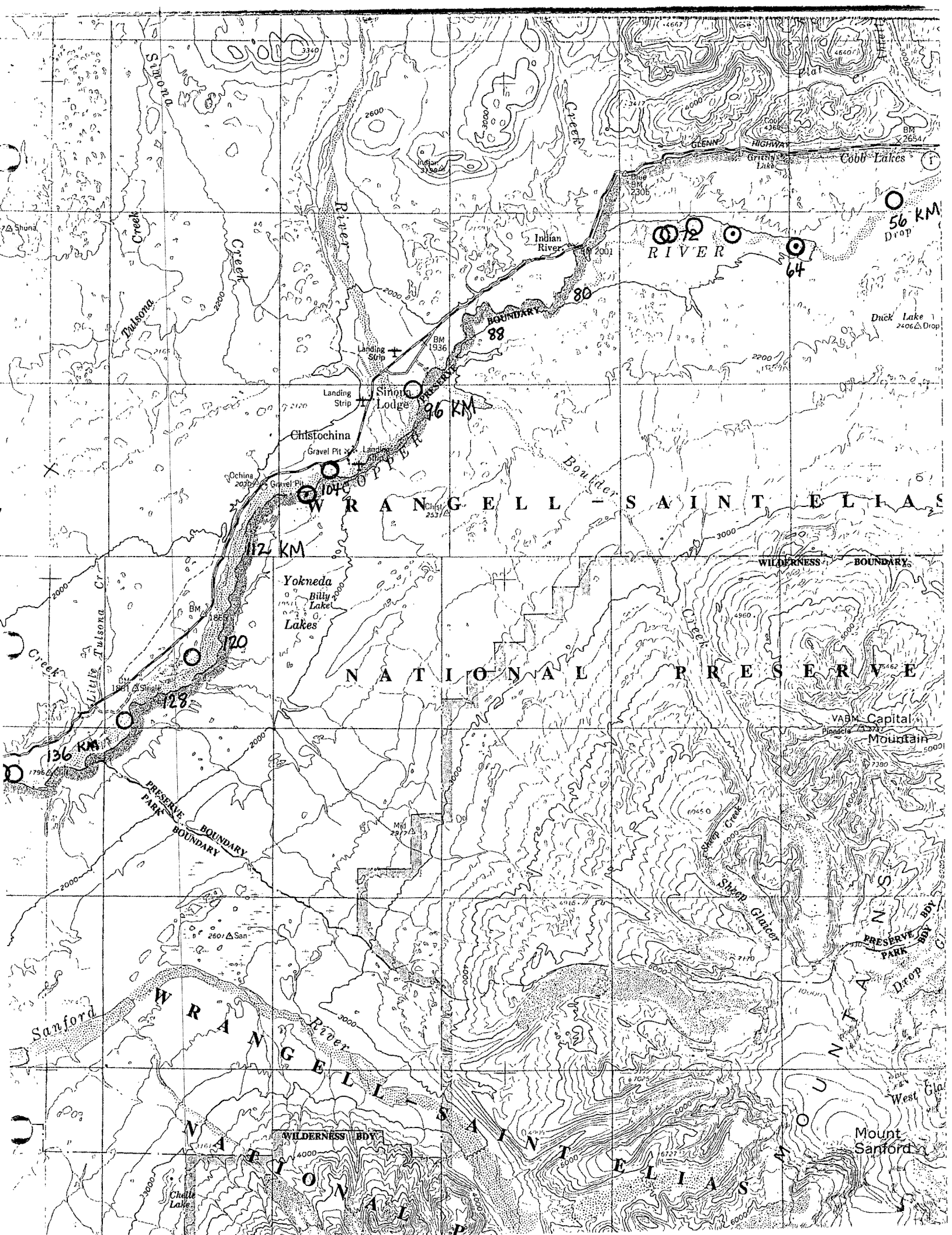
Table 2. Bird Species Observed along the Copper River, July 6-15, 1987.

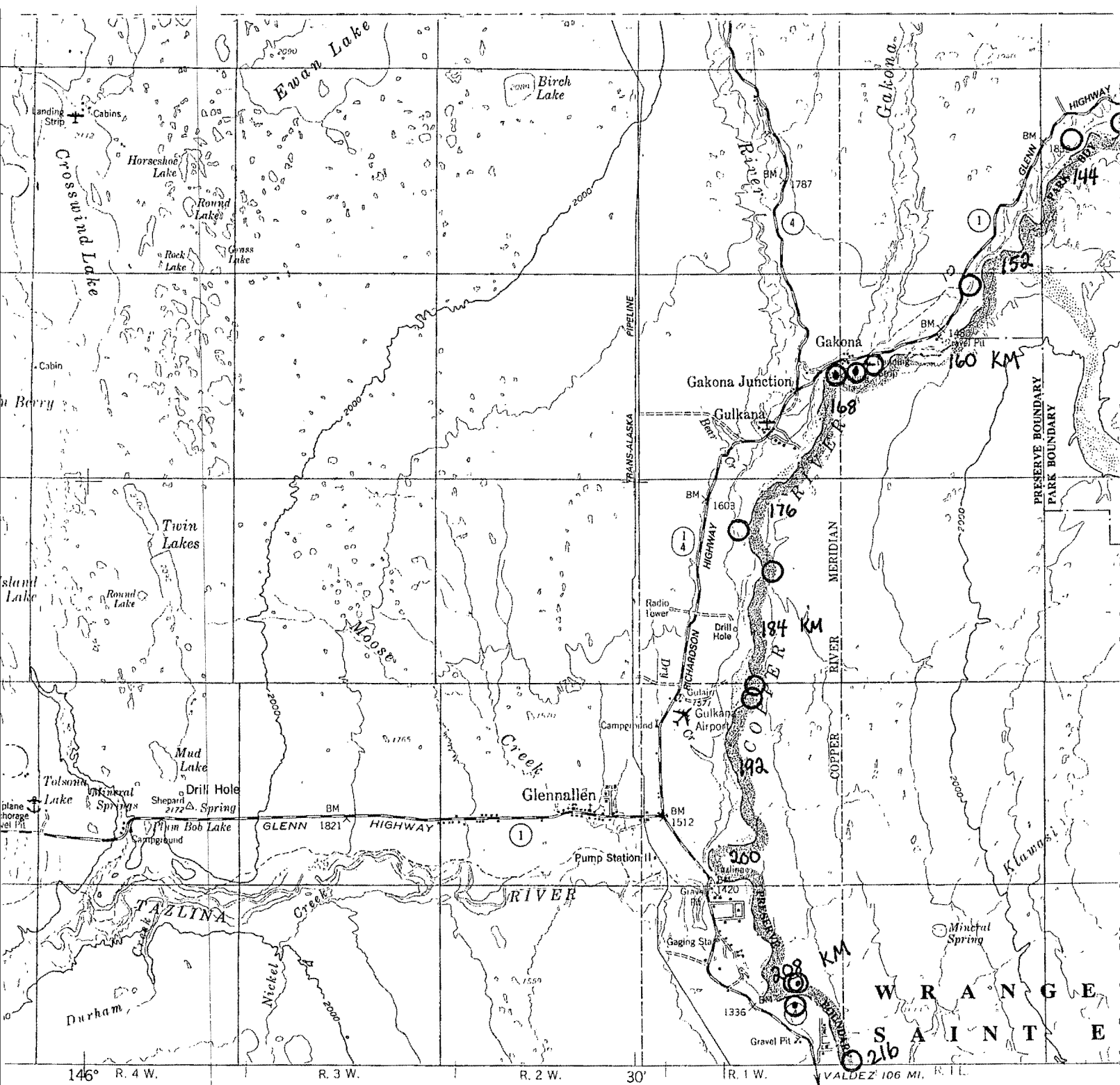
SPECIES	DATE									
	7/6	7/7	7/8	7/9	7/10	7/11	7/12	7/13	7/14	7/15
Common Loon			X							
Trumpeter Swan										X
Canada Goose			X						X	X
Bufflehead				X	X					
Goldeneye sp.	X					X				
White-winged Scoter									X	
Red-Breasted Merganser				X						
Spotted Sandpiper	X	X	X			X	X	X	X	
Semi-Palmated Plover		X	X							
Mew Gull	X	X		X	X	X	X	X	X	X
Herring Gull	X	X		X	X	X	X	X	X	X
Glaucous-winged Gull									X	
Bonaparte's Gull				X						
Arctic Tern	X	X		X	X			X	X	
Bald Eagle	X	X	X	X	X	X	X	X	X	X
Red-tailed Hawk	X			X	X	X				
Sharp-shinned Hawk								X		
Belted Kingfisher			X	X					X	
Alder Flycatcher					X	X				
Violet-green Swallow	X		X		X	X				
Bank swallow		X			X					
Northern Flicker	X					X				
Gray Jay	X		X							
Black-billed Magpie									X	X
Common Raven			X	X	X	X	X		X	
Black-capped Chickadee			X	X			X	X		
Varied Thrush									X	
Gray-cheeked Thrush		X								
Hermit Thrush		X			X	X		X	X	
American Robin				X						
Northern Shrike									X	
Bohemian Waxwing		X		X	X		X			
Orange-Crowned Warbler						X				
Yellow-rumped Warbler			X							
Yellow Warbler									X	
Wilson's Warbler						X		X		
Savannah Sparrow		X								
Dark-eyed Junco					X	X		X		
White-crowned Sparrow		X		X	X	X	X			
Fox Sparrow							X	X		
Lincoln's Sparrow				X						
American Tree Sparrow						X				
Common Redpoll		X	X						X	
Pine Siskin						X				

Appendix A. Location of Bald Eagle Nest Trees along the Copper River, Alaska, 1987/88. Due to the difficulty of determining precise locations along the river corridor, nest locations should be considered approximate.

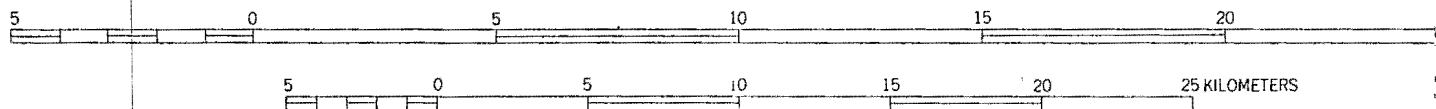
U.S. Geological Survey, scale 1:250,000 quads: Nabesna
Gulkana
Valdez
Cordova







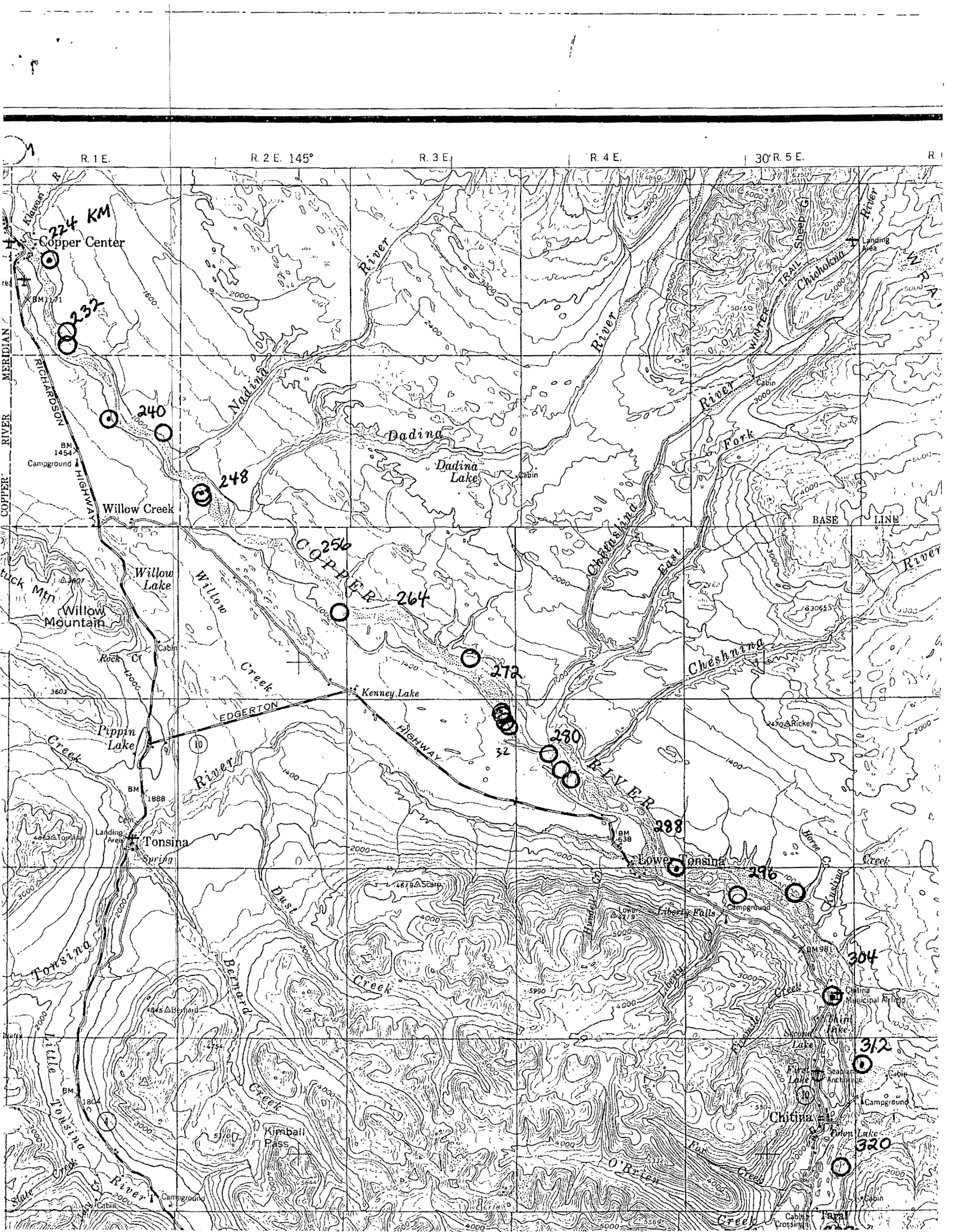
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CONTOUR INTERVAL 200 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

1985 MAGNETIC DECLINATION AT SOUTH EDGE OF SHEET VARIES FROM 27° TO 28°30' EAST

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



R.1 E.

R.2 E. 145°

R.3 E.

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R.1

224 KM
Copper Center

232

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248

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272

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298

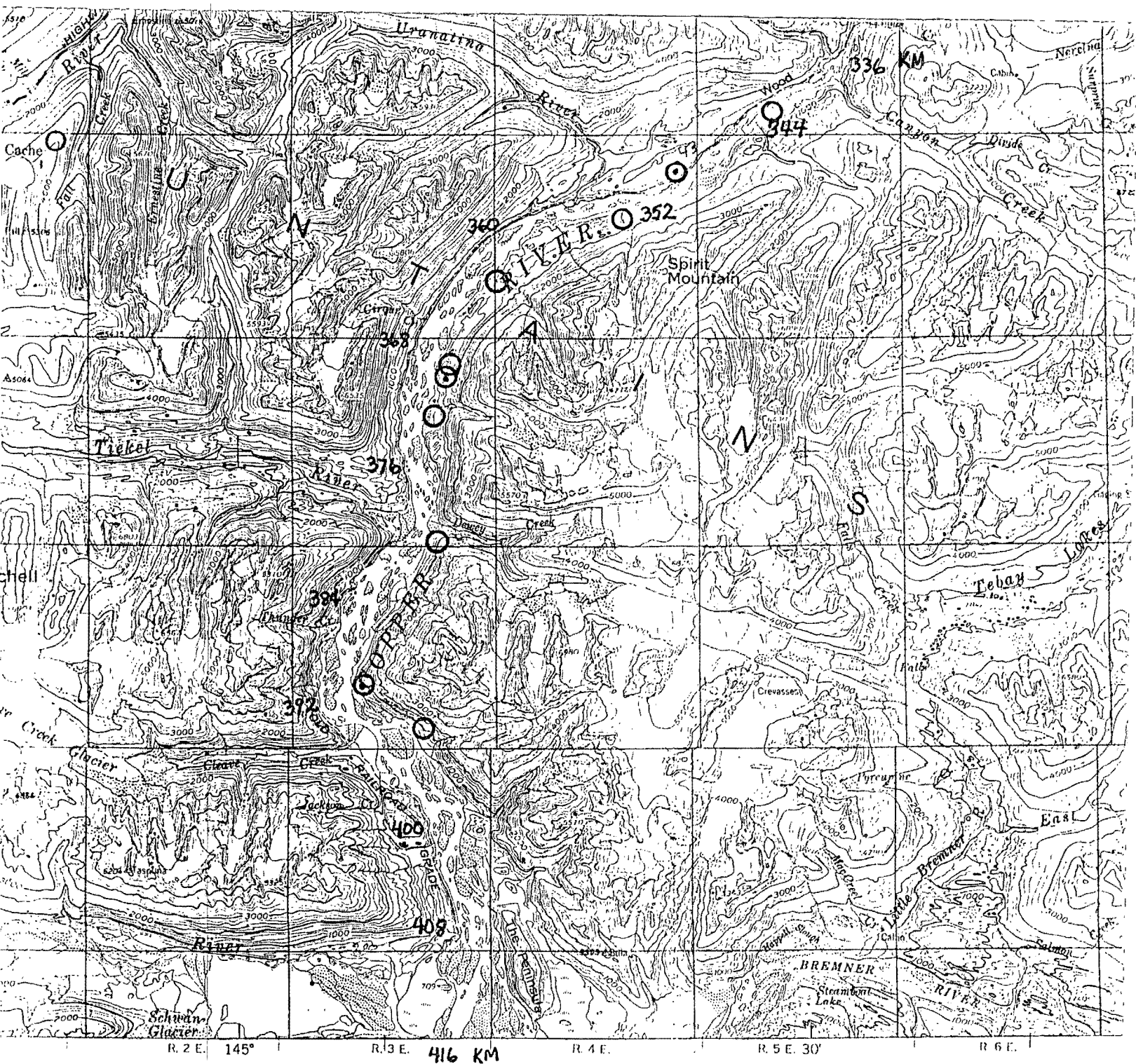
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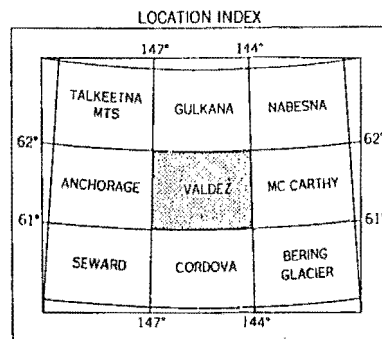
312

320

BASE LINE



0 25 MILES
KILOMETERS



MEDIUM D

