DISTRIBUTION OF DUCKS ON THE WEST COPPER RIVER DELTA DURING THE FALL OF 1980 AND 1981

by

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The Copper River Delta has changed significantly since the 1964 Good Friday earthquake. As a result of considerable uplifting of the area, many brackish ponds became salt free or dry, and large expanses of intertidal mudflats were exposed. Waterfowl hunters maintain that duck hunting has suffered due to these changes, however, little historic harvest data are available to substantiate these claims.

Participants of the Eighth Copper River Delta Conference in 1980 recognized the possibility that claims of deteriorating waterfowl hunting may be valid and identified research and inventory needs to address the issue. As a working tool, they asked the question: Why - what factors affect duck use on the Copper River Delta? To assist in answering this question, fall duck use patterns and habitat preference data were needed. The U.S. Fish and Wildlife Service contracted with the Alaska Department of Fish and Game to collect this information.

ADF&G conducted Fall aerial duck surveys on the Copper River Delta between late August and late October in 1980 and 1981 to identify waterfowl species composition, areas of concentrated use, and the relative abundance of ducks by weekly time periods, location, and general habitat type. This report summarizes the results of those surveys.

ADF&G, in cooperation with the USFS, also distributed hunter harvest questionnaires and obtained upper digestive tracts for food habits analysis. Results of these efforts will be reported in Federal Aid Reports.

Methods

Surveys were conducted generally on a weekly basis between mid to late August and late October in 1980 and 1981. Survey dates were: August 22, Sept. 3, 20, 22; Oct. 1, 10, 21, 29, 1980 and August 17, 25, 31; Sept. 9, 14, 21, 28; Oct. 6, 12, 16, 21, 26, 1981. The survey route (Fig. 1) was fixed and covered approximately 117 miles, of which 70 miles crossed inland pond and marsh habitat and 47 miles intertidal habitat. To facilitate analysis of survey data by habitat type and geographic area, the route was subdivided into 34 segments varying in length from 1 1/4 to 7 1/2 miles. Segment demarcation was based on general habitat similarity.

Surveys were flown at or near high tide in a Cessna 180. The aircraft was maintained at 100 to 150 feet altitude and approximately 100 MPH. Two observers were used, one recorded the total number of ducks and habitat in which they occurred within 1/8 mile of one side of the aircraft, and the second recorded flock size and location. Habitat categories included intertidal (everything seaward of the grass bank-tide flats interface), ponds, rivers and sloughs. Flocks were classified as either 15-50 individuals or more than 50 birds.

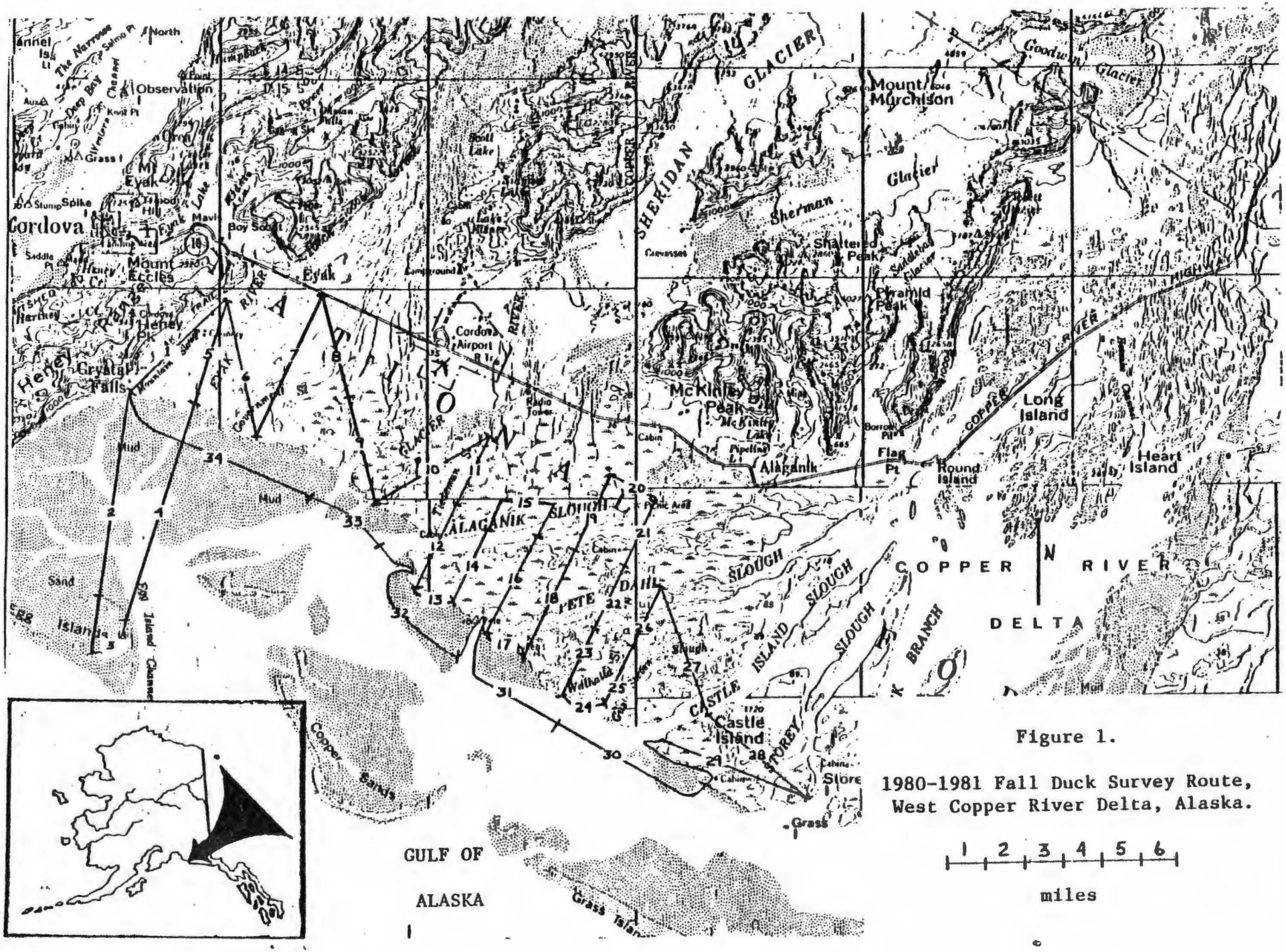

Figure 1.

1980-1981 Fall Duck Survey Route, West Copper River Delta, Alaska.

1 2 3 4 5 6

miles

Results

A total of 33,399 ducks excluding flock size data, was counted during the study, 14,920 in the fall of 1980 and 18,479 in 1981 (Fig. 2). In 1980 the number of birds observed per survey climbed through late August, peaked in mid September and, with the exception of early October, declined throughout the remainder of the fall. The early October increase in duck abundance is common for the Gulf Coast region of Alaska, and probably results from migration of birds prompted by freeze-up in interior Alaska. The 1981 counts were similar to 1980 in that September was the month of highest counts. However, the October secondary peak in duck numbers was much smaller in 1981 than 1980. Duck species composition during these counts was not determined due to inconsistancies in the data.

A strong habitat preference was noted during the study period (Fig. 3). Over 75% of the ducks observed were on the intertidal zone. In 1980, 67.3% of the birds seen were on the tide flats, tide guts and Egg Island complex while 86.1% of the birds occurred in these areas in 1981. This preference changed during the fall of both years. During August and early September ducks showed a strong preference for the intertidal areas over inland ponds and marshes but, as the fall progressed, the frequency of ducks inland increased.

Duck flock size and location data also indicate a strong preference for the intertidal zone (Table 1). In 1980 the smaller flocks of ducks (15-50) apparently had near equal preference for the tide flats and inland marshes while 83 percent of the larger flocks (>50) preferred the open intertidal zone. Flock distribution in 1981 illustrated a much stronger preference with over 73 percent of the small groups and nearly 90 percent of the large flocks preferring the intertidal zone.

Relationships between flock size, habitat use and time of year were observed. Throughout the fall of 1980, groups larger than 50 ducks were most often seen on the intertidal zone (Fig. 4). In fact, this was the only place large groups were observed during the last half of October. In contrast, groups composed of less than 50 birds were most commonly seen on the intertidal zone from August until late September but they occurred more frequently on inland ponds and marshes after that time. In 1981 (Fig. 5), use patterns differed from 1980 in that both flock sizes were more frequently seen on the intertidal zone throughout the fall.

Table 1. 1980-81 fall distribution of duck flocks on the West Copper River Delta.

Flock Size	Intertidal Zone		Inland	
	1980	1981	1980	1981
15-50	52.9%	73.4%	47.1%	26.6%
>50	83.1%	89.5%	16.9%	10.5%

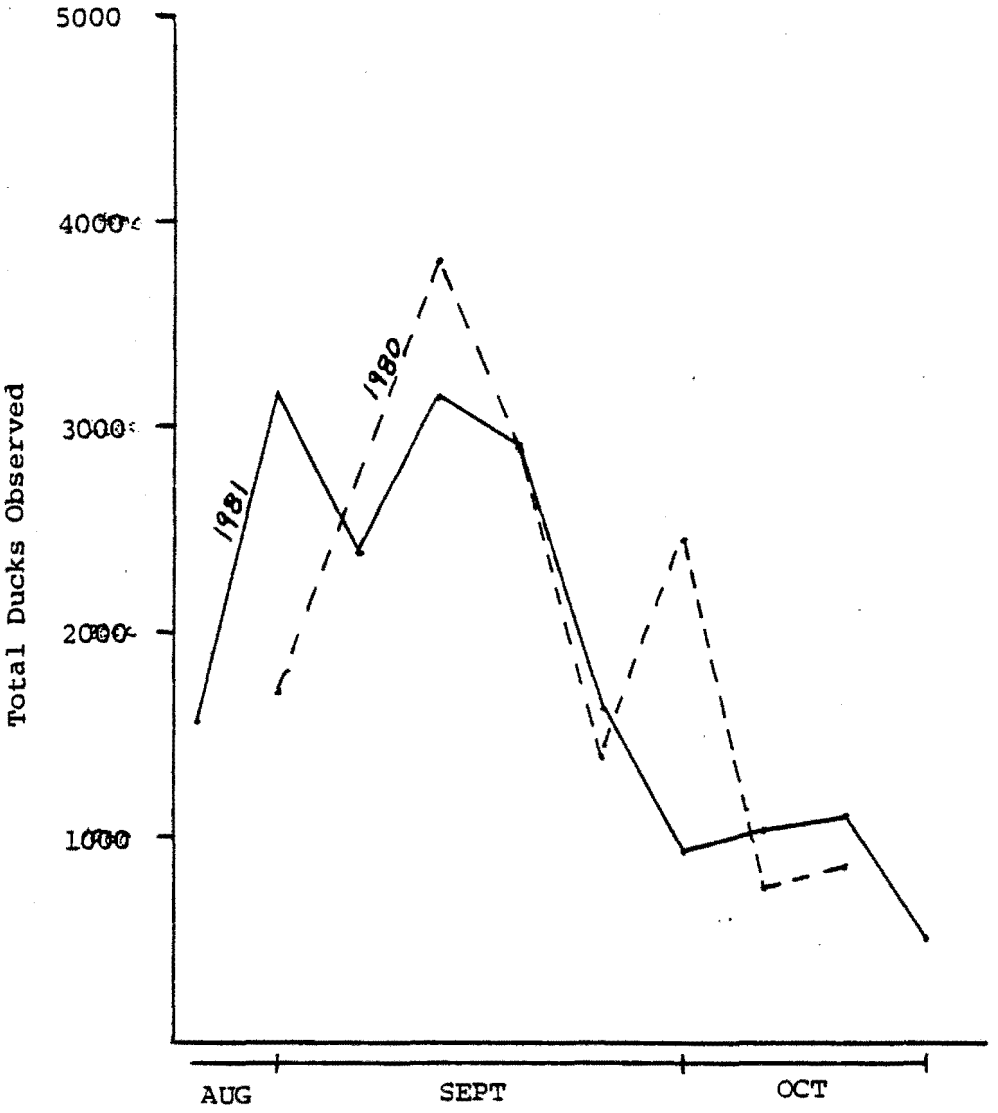

Figure 2. Number of ducks observed on each survey during 1980-81 Copper River Delta fall duck surveys.

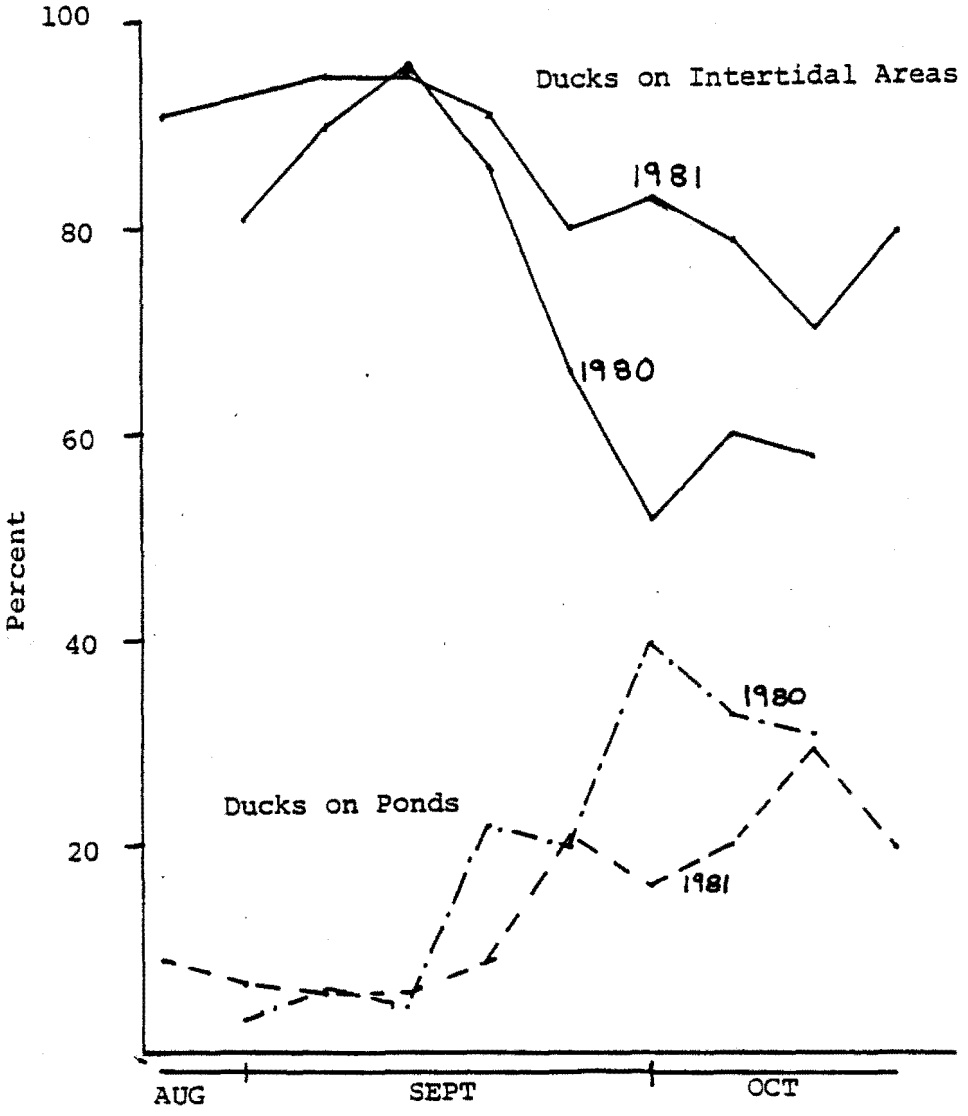

Figure 3. Distribution of ducks during 1980-81 Copper River Delta fall duck surveys.

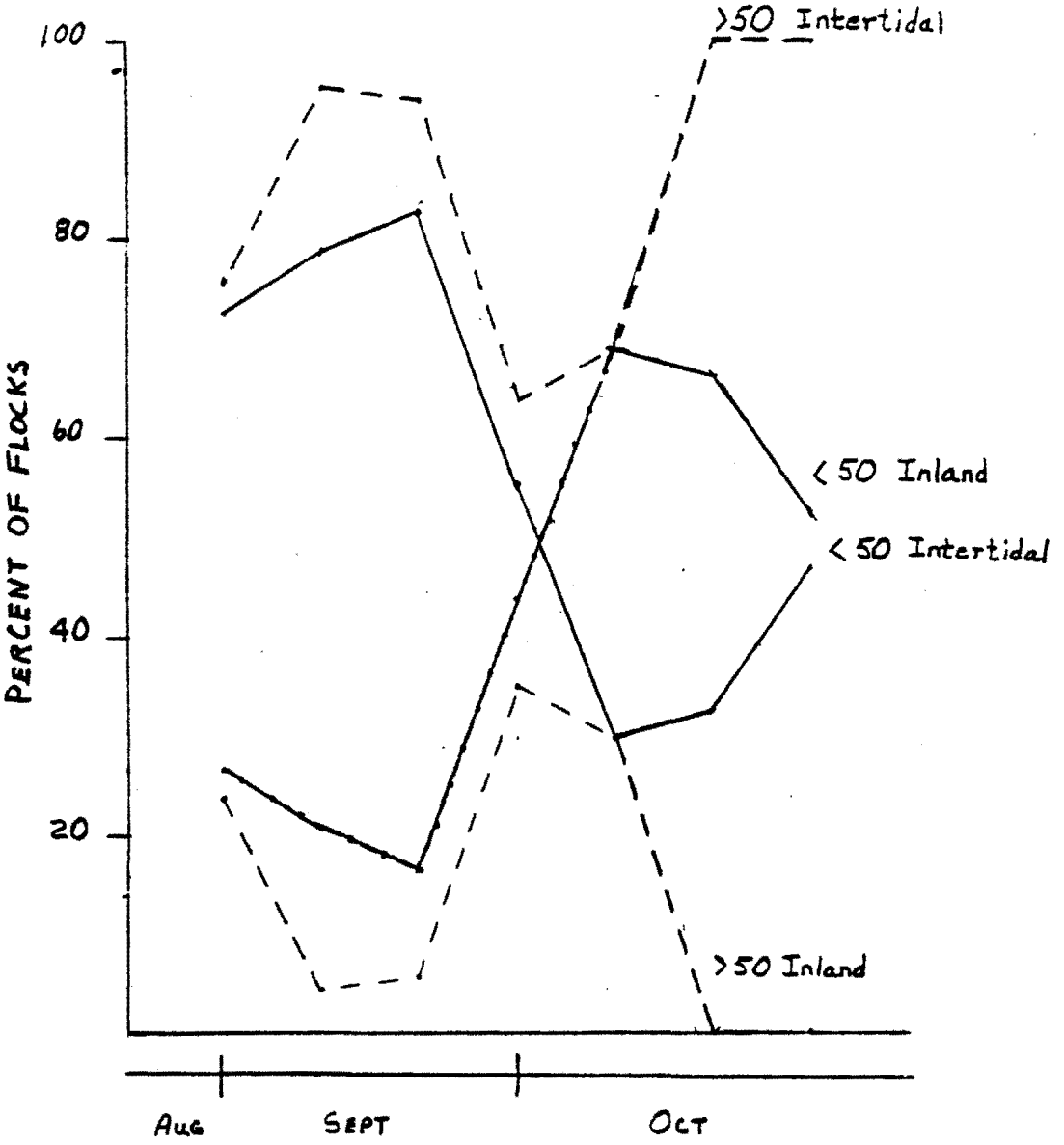

Figure 4. Distribution of flocks of ducks greater than and less than 50 birds during the 1980 Copper River Delta fall duck surveys.

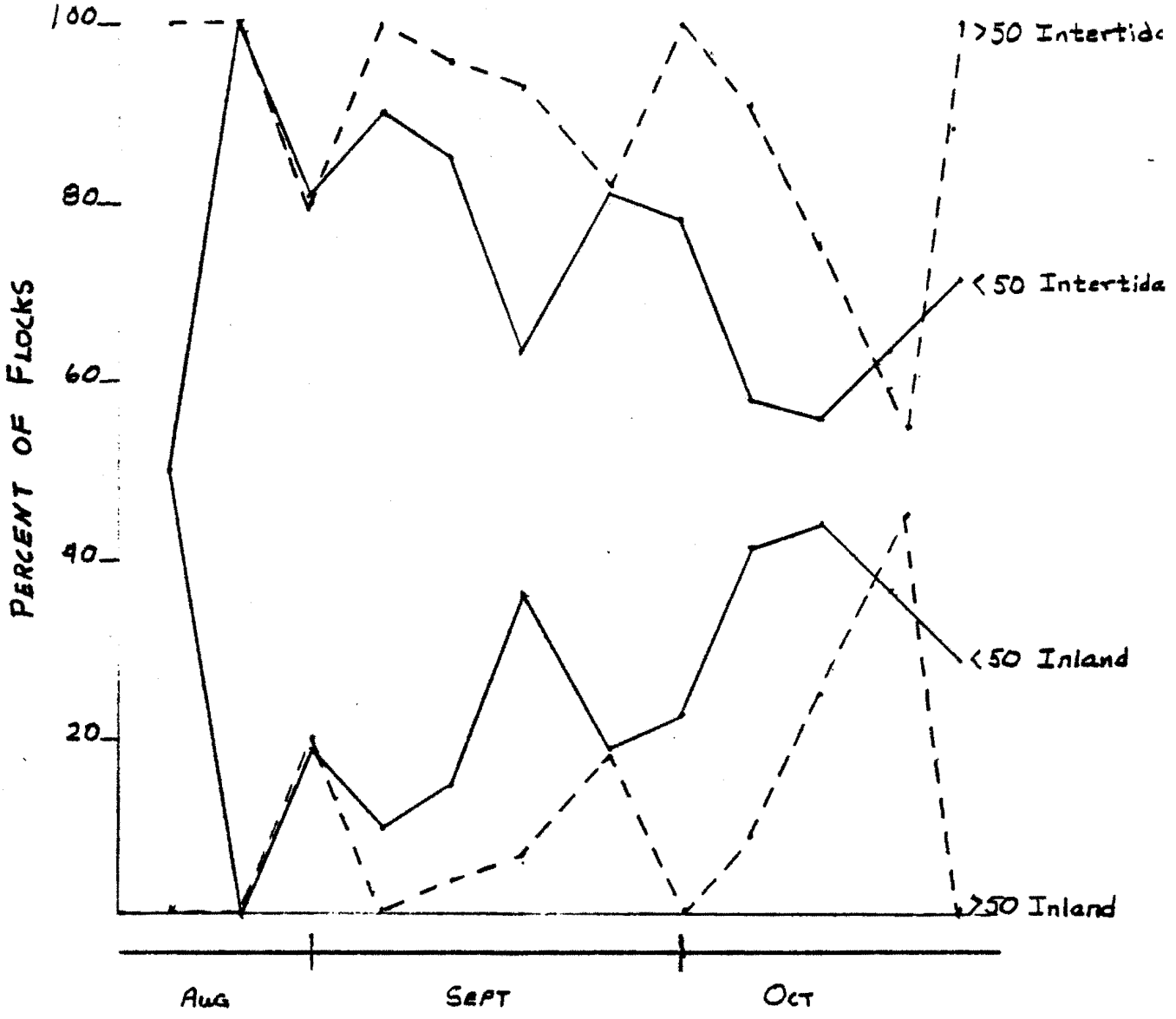

Figure 5. Distribution of flocks of ducks greater than and less than 50 birds during the 1981 Copper River Delta fall duck surveys.

Survey segments with high fall duck concentrations are identified in Figures 6-8. Minor concentrations occurred on Castle Island (7.8 ducks/mi), Gus Stevens Slough (5.4 ducks/mi.), and the Eyak River to Government Slough segment (5.5 ducks/mi.). All major concentrations were observed on the intertidal zone. Concentrations ranged from over 70 birds per mile on Egg Island and segment 34, to 15 birds per mile along the mud flats between Alaganik Slough and Glacier River. Concentrations of ducks were observed on segments 31, 32 and 34 during all survey flights.

Several areas had consistently low or no duck concentrations. These included the marsh-tide flats interface between Gus Stevens and Walhalla Sloughs (0 birds/mile), Upper Government Slough (0 birds/mile), and segments 19 and 21 bisecting upper Alaganik Slough (0.2 and 0.1 respectively).

Goose and swan numbers and distribution data were also collected during the surveys. A total of 2826 geese and 972 swans was observed during the two falls (Fig. 9 and 10). In 1980, 2,070 geese including 40 white-fronted and 2030 Canada geese plus 535 swans were seen while 756 Canada geese and 437 swans were observed in 1981. With one exception in 1980, geese were more common on the west Delta in the early fall while swan numbers did not increase until late September or early October. The exception occurred on October 10, 1980 when over 1,000 geese were observed in one group on the tide flats. This dramatic increase was likely due to a "wave" of migrating geese passing through the area. Timm (per. comm.) reported the movement of large flocks of waterfowl through the Cook Inlet area between October 8 and 11. J. Reynolds. (per. comm.) reported a similar situation on the east side of the Copper River on October 11, 1980.

Fall goose distribution data were erratic and probably insufficient for detailed analysis. However, general trends in habitat use can be identified (Figures 11 and 12). Marshes were important to geese until mid to late September. During this period 48.2% (1980) and 50% (1981) of the geese observed were on inland wet meadows, ponds, rivers and sloughs. After mid to late September a near total shift to the intertidal zone was observed with 98.6% (1980) and 100% (1981) of the geese observed on mudflats and tideguts.

The noted shift in habitat preference likely reflects subspecies composition of the fall goose population on the west Copper River Delta. Dusky Canada geese (Branta canadensis occidentalis) are summer residents on the Delta, and this subspecies prefers inland marshes and grasslands (Mickelson, et. al. 1980. Ak. Coop. Wildl. Research Unit Rpt. p. 45) until they leave the area in mid to late September (Hawkings, J. S. 1981. Ak. Coop. Wildl. Res. Unit Rpt. p. 18). From late September through October migrating Taverner's canada geese are common on the delta (Timm, per. comm.). Taverneri uses the saltgrass meadows along the interface between the intertidal zone and inland marsh and frequents the mudflats (Mickelson op. cit.). While the subspecies of geese seen during the surveys were not determined, the reported changes in subspecies composition of the fall goose population coincides with the shift in habitat preference illustrated in Figures 11 and 12.

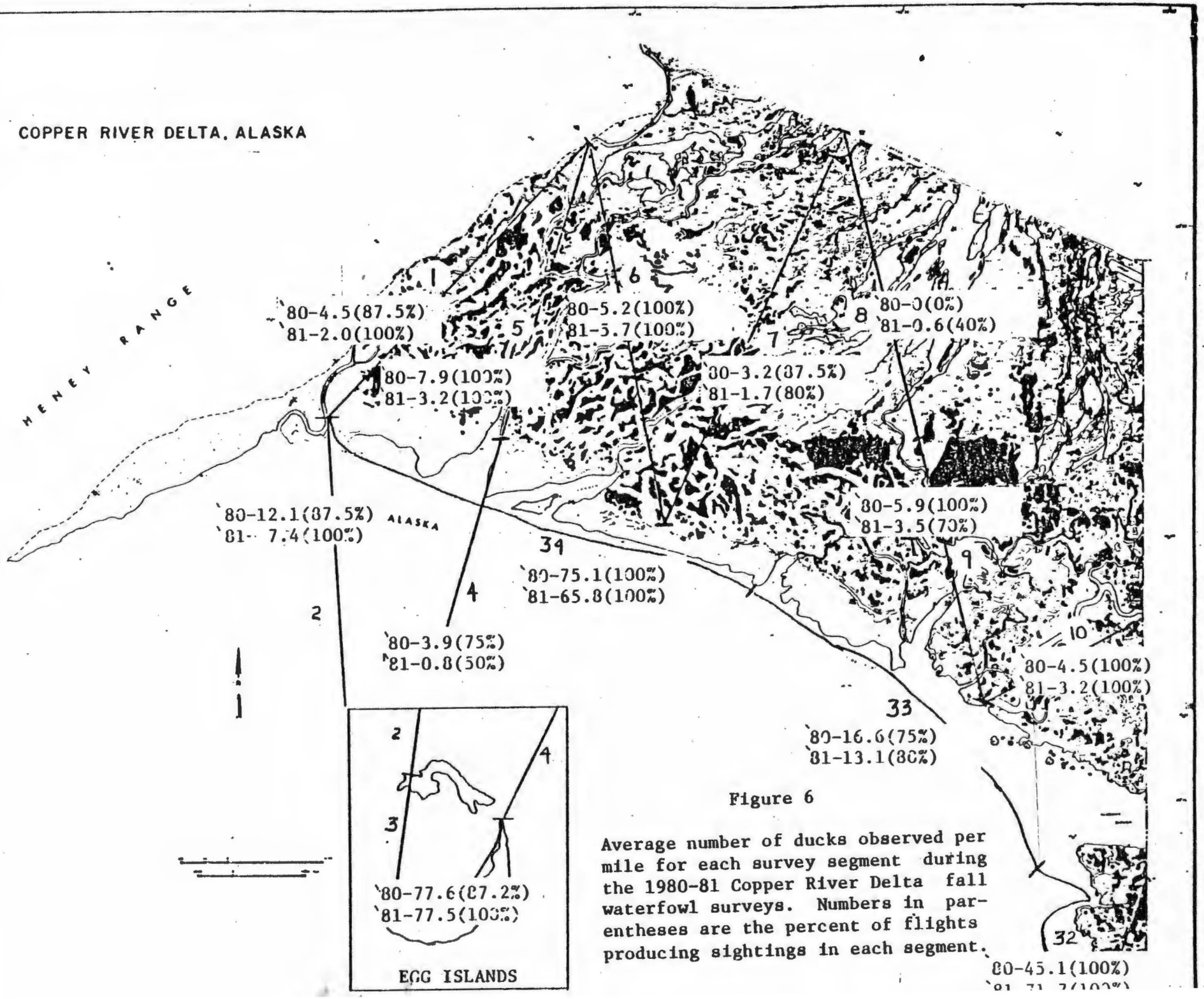

Figure 6

Average number of ducks observed per mile for each survey segment during the 1980-81 Copper River Delta fall waterfowl surveys. Numbers in parentheses are the percent of flights producing sightings in each segment.

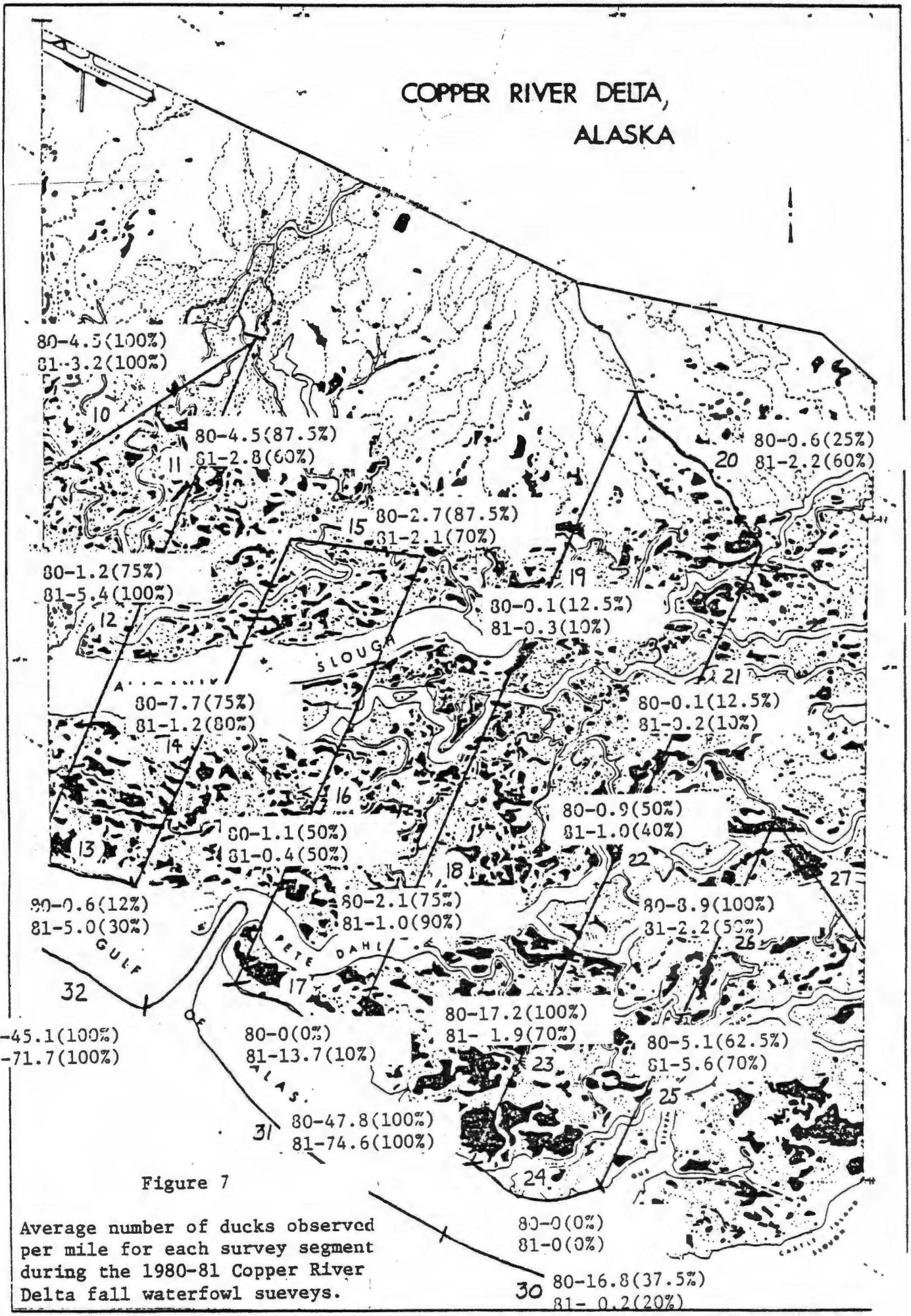

Figure 7

Average number of ducks observed per mile for each survey segment during the 1980-81 Copper River Delta fall waterfowl sueveys.

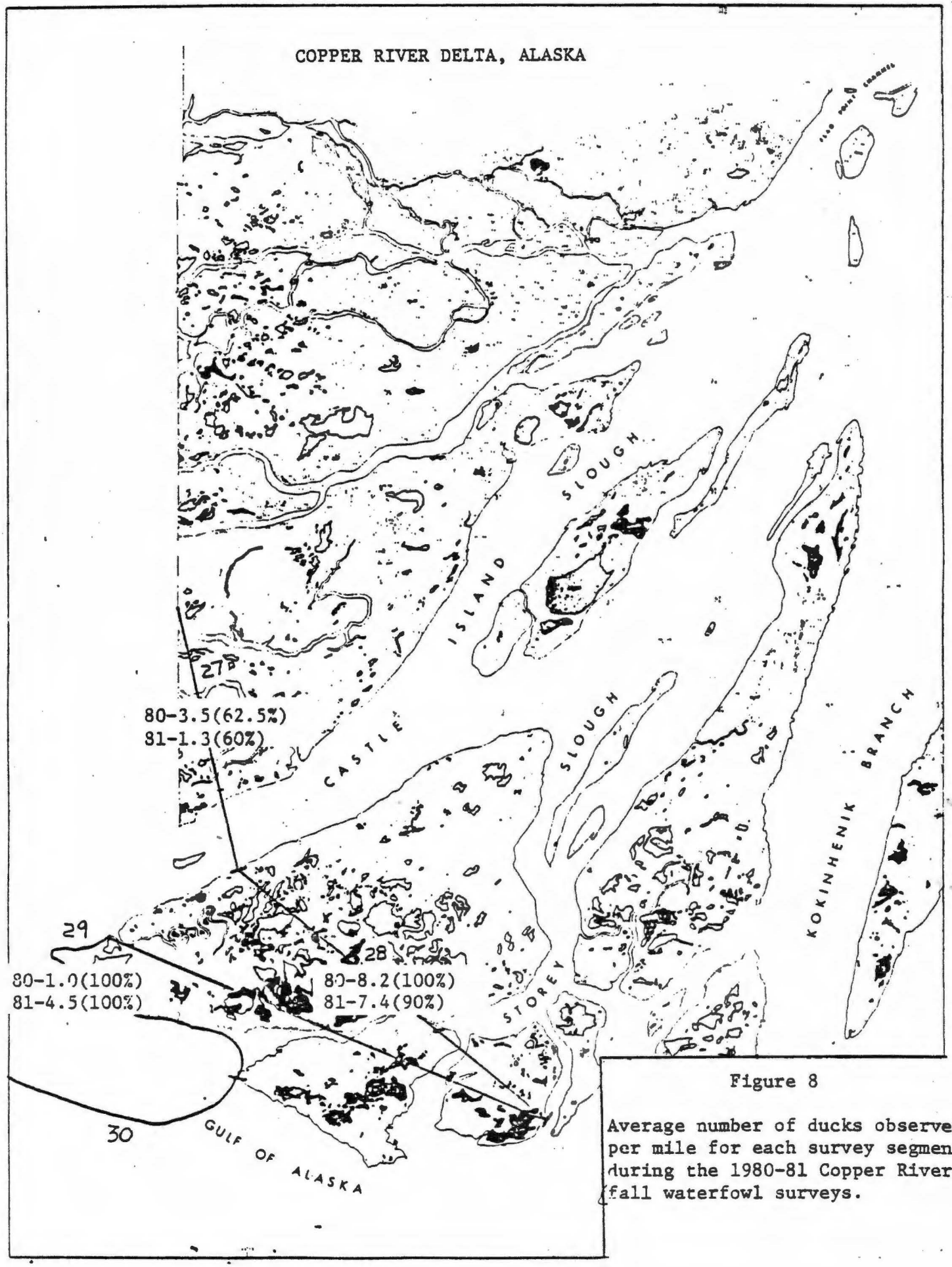

Figure 8

Average number of ducks observed per mile for each survey segment during the 1980-81 Copper River fall waterfowl surveys.

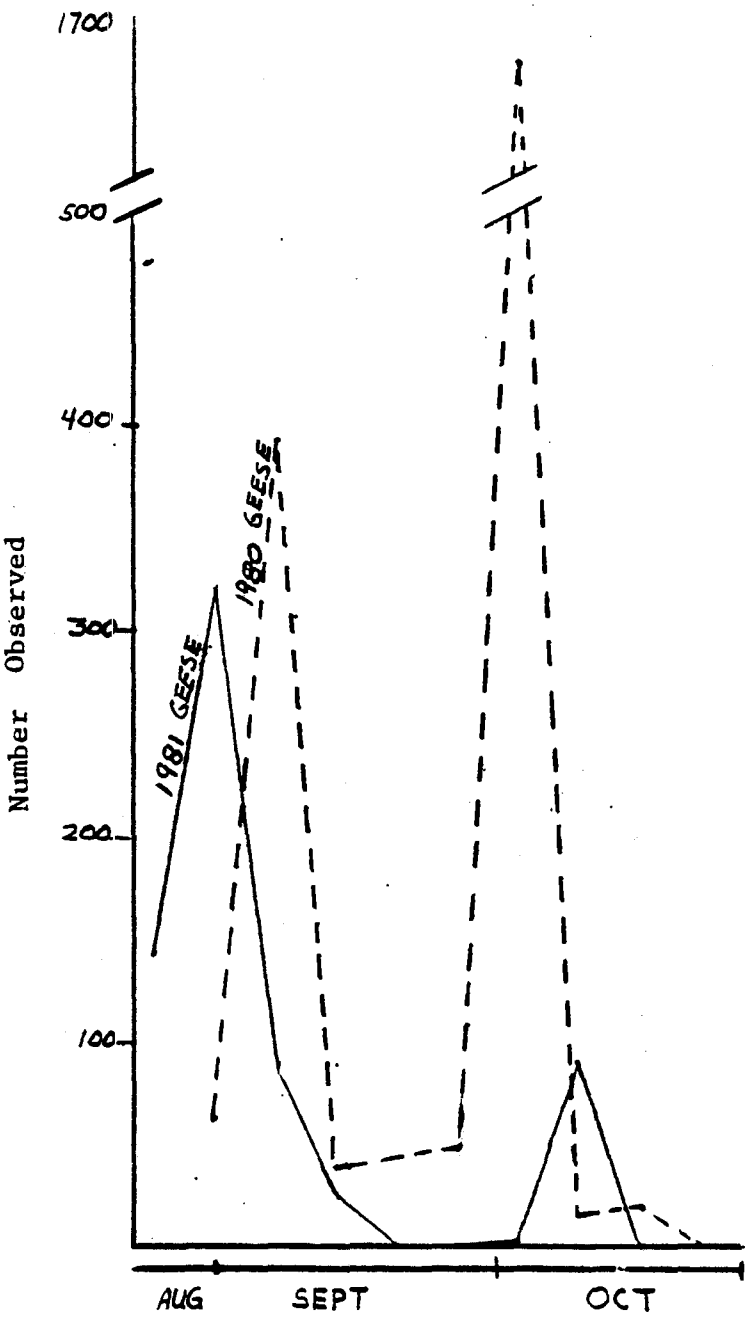

Figure 9. Number of geese observed on each survey during 1980-81 Copper River Delta fall duck surveys.

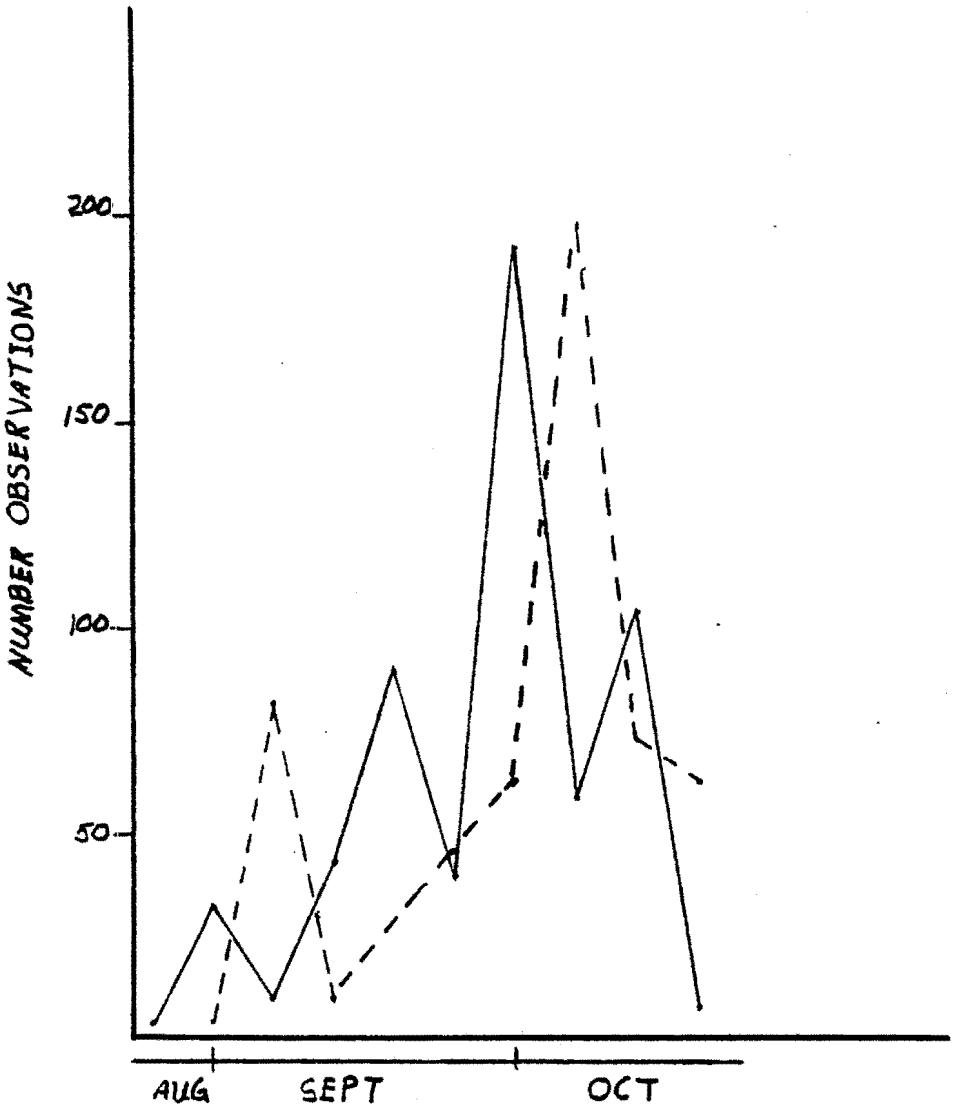

Figure 10. Number of swans observed on each survey during 1980-81 Copper River Delta fall duck surveys.

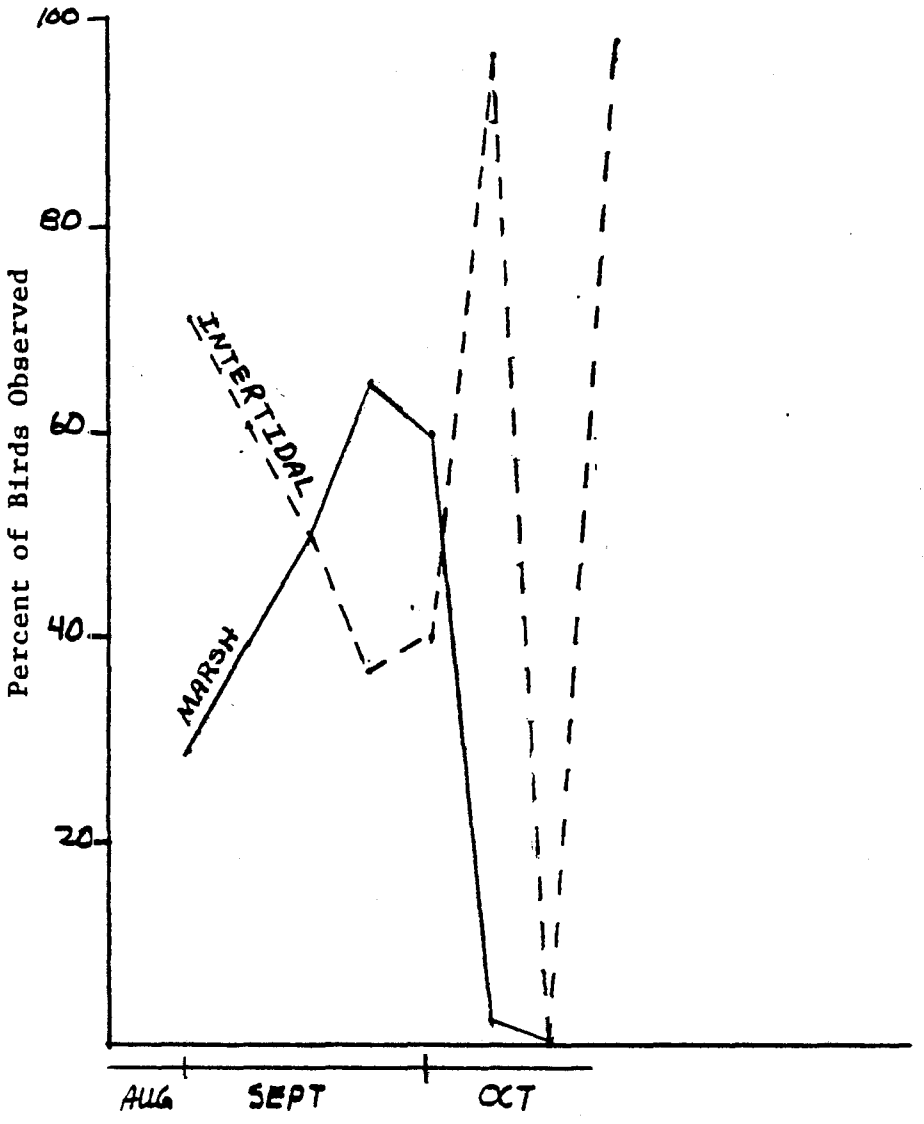

Figure 11. Distribution of geese during 1980 Copper River Delta fall duck surveys.

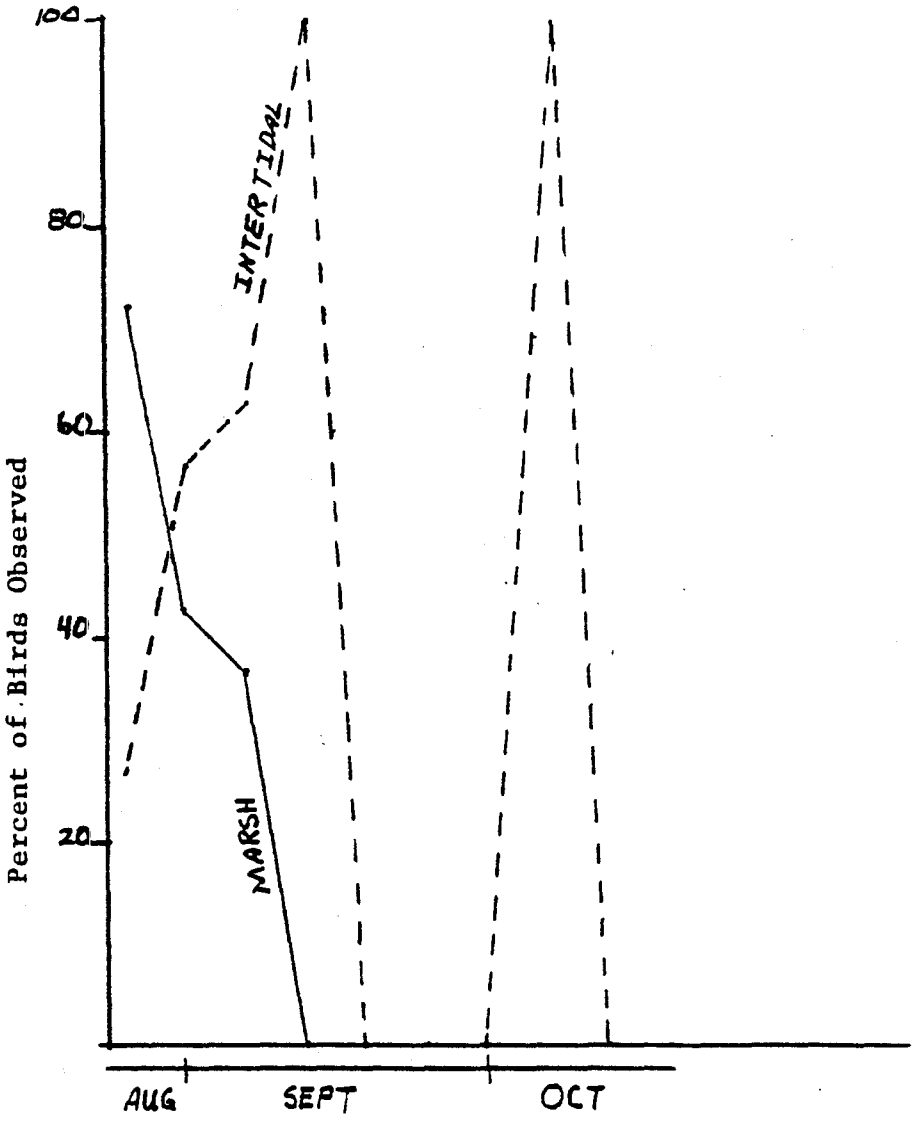

Figure 12. Distribution of geese during 1981 Copper River Delta fall duck surveys.

Swan distribution indicated a strong preference for inland habitats. All of the observations were on inland bodies of water in 1980 while 96.2% of the 1981 observations were on ponds, rivers and sloughs. Fifty-five swans were seen on the tide flats in 1981, 20 on September 21 and 35 on October 26.

Discussion

An obvious conclusion is that ducks had a very strong habitat preference during the falls of 1980 and 1981, with the intertidal zone much preferred over inland marshes and rivers. Over 75 percent of the ducks observed and 78 percent of the total flocks were in the intertidal zone. This inbalance in distribution is partially due to ducks on the mud flats being more visable than those on small ponds. However, ground observations by Reynolds (per. comm.) and hunter complaints substantiate the lack of ducks inland.

Temporal changes in both flock distribution and total duck observations were similar both years although the magnitude of these changes was more pronounced in 1980. Ducks were observed over 15 times more frequently in the intertidal zone than the inland zone from the middle of August until mid September when the maximum number of intertidal observations occurred. After this time the number of birds seen on inland ponds and rivers generally increased but was never greater than a ratio of 1:13 inland to intertidal sightings (Oct. 1, 1980).

As might be expected, large flocks of ducks (>50) were most common on the intertidal zone throughout both falls. The distribution of smaller flocks (15-50) changed during the falls of both years. They occurred 4 times more frequently on the intertidal zone than inland marshes until mid September when their frequency of occurrence on the inland zone increased. In fact, by the first part of October in 1980, small flocks occurred more frequently inland than on the intertidal area.

The shift in habitat preference during the falls of 1980 and 1981 (Fig. 3), although not major, was from the intertidal zone to the inland zone. Timm (per. comm.) reports that similar shifts are common in upper Cook Inlet. The relative abundance of species preferring inland marshes, such as Mallards, increases as the total number of birds in an area declines, resulting in an apparent shift in duck habitat preference from intertidal to inland marshes. However, greater food availability inland versus intertidal as the season progresses cannot be discounted.

Certain parts of the intertidal zone appear more important to waterfowl than others. Egg Island, the areas between the mouths of the Eyak and Glacier Rivers, and Alaganik and Gus Stevens Sloughs consistently supported large number of ducks, contrasted to intertidal zones between Alaganik Slough and Glacier River, and the Copper River and Gus Stevens Slough. These areas, which appear similar to the other intertidal areas, supported far fewer ducks.

The only inland marsh areas surveyed that were fairly consistently used by ducks during the falls of 1980 and 1981 were Castle Island, Gus Stevens Slough and the marshes, ponds and sloughs between Eyak River and Government Slough.

If these surveys are representative of present fall distribution of ducks and they apparently are, it is evident why duck hunting has "deteriorated" on the Copper River Delta. While long-term population and distribution data are not available, one may speculate that the "deterioration" is not so much the result of declining populations on the Delta as it is of shifts in areas of heavy duck use. Shepard (45th Ann. Conf. West. Assoc. St. Game and Fish Comm., 1965) reported that up to 20 sq. miles of intertidal mud flats adjacent to the shoreline of the Copper River Delta were raised and exposed by the 1964 earthquake. Work presently being conducted by the U.S. Forest Service, Pacific Northwest Range and Experimental Station personnel indicates that new plant communities are evolving on these uplifted areas. Major concentrations of ducks in fall have apparently shifted from inland habitats to these new areas.

Recommendations

1. Fall surveys should continue for at least 2 more years to determine areas of the West Copper River Delta used consistently by fall ducks over an extended period. Future surveys should include the collection of duck species composition data.

2. Upper tracts of ducks collected in 1980 and 1981 will be analyzed for food habitats. However, no ducks were collected on intertidal areas. Future collections should be made there, as well as on supratidal habitats.

   Unfortunately, due to budgetary restrictions, the Alaska Department of Fish and Game can not continue fall duck surveys unless they are conducted in conjunction with a research effort by the U.S. Forest Service or U.S. Fish and Wildlife Service, to determine why the birds are where they are, in the fall.