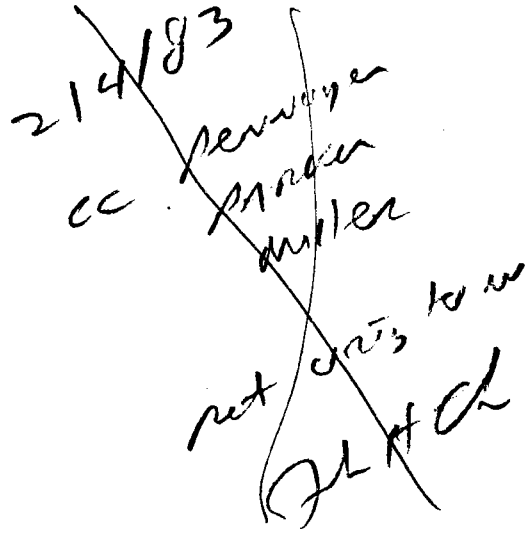
LEGISLATIVE REPORT 1982 ALEUTIAN ISLANDS SALMON STOCK ASSESSMENT STUDY



LEGISLATIVE REPORT

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ALEUTIAN ISLANDS SALMON STOCK ASSESSMENT STUDY

JANUARY 1982

ALASKA DEPARTMENT OF FISH AND GAME
DIVISION OF COMMERCIAL FISHERIES
P.O. BOX 3-2000
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LEGISLATIVE REPORT

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INTRODUCTION

The 1980 Legislature requested that the Department of Fish and Game provide it with data and statistics on the salmon streams and historic salmon catches in the Aleutian Islands. This information was to be included in a joint report with the Commercial Fisheries Entry Commission concerning the establishment of the Aleutian Islands as a separate administration area which could allow local people the opportunity to fish salmon. The report was less than complete, in regards to the lack of data available concerning Aleutian salmon streams

The Department requested funding to conduct a comprehensive research study of the Aleutian Islands salmon resources and in 1981 the legislature allocated $211,000 for that purpose. Since funding was too late for the 1981 season the project began during the 1982 field season. Because of the cyclic odd and even year difference of return of pink salmon, the primary specie of salmon in the area, it would be desirable to conduct the surveys for two consecutive years. Unfortunately operational costs were greater than anticipated and the majority of the funds were expended on the high priority field surveys this season. If additional funding is made available the areas of highest commercial potential will be reassessed in the summer of 1983.

The 1982 Aleutian Islands salmon study encompassed the area west of Unimak Pass to Attu Island, a distance of roughly 1,000 miles (Figure 3). Numerous islands of varying characteristics make up the Aleutian Chain, ranging from mere rocky pin points to 70 mile long Umnak Island. Thirteen major islands and several minor land masses were investigated regarding anadromous stream potential.

Prior to this study Departmental knowledge of the area was sparse with the exception of Unalaska Island. The September 14, 1974 anadromous stream catalog lists 444 anadromous streams in the Aleutian Islands. One hundred and five of these streams are listed for Unalaska Island and eastward, leaving 339 listed streams of which little was known from Umnak to Attu Island. As a result of this study an additional 157 systems were found to have anadromous fish populations, while 44 systems were deleted.

The 1982 field study was conducted to research the potential of the Aleutian Islands for commercial salmon fisheries. This research was conducted with the cooperation and support of the U.S. Fish and Wildlife Service, U.S. Coast Guard, U.S. Navy and U.S. Air Force. The islands with the highest potential for commercial harvest were examined. Basic studies on a prioritized basis included: 1) Species identification and enumeration. 2) Cataloging, photographing, and recording physical characteristics of salmon streams. 3) Definition of spawning areas. 4) Recording streams with a potential for rehabilitation and enhancement. 5) Examination of returning fish for high seas salmon tags. 6) Gathering length/weight and age data [1/] of salmon at one major stream on each island examined. 7) Collection of tissue samples from pink salmon for stock separation studies.

This report will focus on the primary objective of the project, salmon enumeration and species identification. The Westward Region Report to the Alaska Board of Fisheries contains a more descriptive account of this study. A later publication in the ADF&G Technical Report series will provide greater detail which will include a photographic stream catalog, stream habitat information and a summary of salmon length, weight and age data. The University of Alaska, Juneau, will issue a separate publication on results of the pink salmon stock seperation study based on tissue samples collected by this project.

[1/] Otoliths and/or scales were taken from red and chum salmon when they were encountered in significant numbers to sample.

Flying hours during this study were often restricted by severe weather, thus reducing the ability of the study team to achieve all of its objectives for each stream. Salmon enumeration, the primary objective of this study, was carried out for every potential stream system between Unalaska and Kiska, except for one lake on Tanaga Island. Agattu (an island with a very low potential for salmon) was deleted due to weather delays early in the project. Attu Island received an intense foot survey effort but the rugged topography of the island restricted the study to approximately 40% of the streams on the island.

The timing of this study was focused on obtaining the best data on pink salmon. Out of necessity we were unable to assess all runs of each species of salmon equally well. Counts of other species are acknowledged as underestimates. The study may have been too late to accurately assess early runs of sockeye and chum salmon. It probably was too short in duration, because coho were just beginning to enter fresh water at the end of the field work. High winds and water turbulence made it nearly impossible to make any counts of coho schooling in saltwater. The amount of time required to completely assess coho would probably not be cost effective due to delays from weather after the 15th of September. It is acknowledged that counts of species other than pinks were underestimates of the actual stock size, however, extensive examination of potential habitat for these species leads the investigator to conclude that the actual numbers of these species is quite small on most islands. There were no systems which would provide for spawning and rearing of king salmon. King salmon landed in the Aleutians are most like "feeder kings" intercepted while migrating through the Aleutians.

Salmon weight information, summarized by species in Table 2, should not be interpreted as being maximum weights. The project attempted to sample the freshest individuals in at least one major system on each island surveyed. In some cases, as the result of the timing of the runs it was necessary to sample fish which had been in freshwater for varying lengths of time and had lost weight when compared to sea run fish. Therefore, the data gathered should be used for relative comparisons.

Pink salmon sampled in this study were at least 1 pound larger than expected. The largest salmon encountered were from an Atka Island sample. These fish weighed an average of 4.24 pounds. The average weight of fish sampled was 3.8 pounds.

The sockeye salmon that were sampled all were spawning with the exception of those on the Kagalaska Island. These fish were smaller than most mainland runs averaging 4.6 pounds, with the bright fish on Kagalaska weighing 4.4 pounds.

Only three chum runs of any significance were located during the study. The largest (1,350 salmon) was on Atka Island. The one run sampled on Atka averaged 7.6 pounds. It should be noted that these fish were spawning, and their weights were probably low compared to fresh fish.

FIELD OPERATIONS

Umnak to Kiska:

The study team was made up of the project leader, one Fishery Biologist I seasonal, 2 Fishery Biologists from the University of Washington Fisheries Research Institute, a helicopter pilot/mechanic and a vessel crew of four. During the 51 day charter, research was conducted from Unalaska Island to Kiska.

The University of Washington research vessel ALASKA was equipped with a 20' x 21' helicopter landing pad. A chartered Bell Jet Ranger helicopter was used to deploy field crews and to conduct aerial stream surveys of the islands with the vessel acting as base of operations and logistical center. The use of a helicopter allowed stream surveys to be conducted where steep terrain and weather would have made fixed wing and foot surveys impossible. The vessel also carried a 16' Zodiak raft and Boston Whaler which were utilized for transportation for foot surveys during weather too inclement for helicopter operations.

The weather delays prior to reaching Kiska resulted in canceling an attempt to provide contingency helicopter surveys of Attu and Agattu Islands.

Unalaska Island East to Unimak Pass:

Aerial stream surveys of major systems on Unalaska and Akutan Islands were conducted by the Alaska Peninsula/Aleutian Islands Area Management Staff. Annual stream surveys were flown out of Dutch Harbor in August and early September to assess escapements to major systems. Surveys were conducted by this project in the areas of Unalaska which previously had received little or no assessment effort. This included Beaver Inlet, the south side, and the southwest panhandle of the island west of Skan Bay.

Attu Island:

Attu Island is potentially the most productive island in the western Aleutians for salmon, based on the limited information available. Due to this potential and geographical separation from the other major Aleutian Islands, a separate field study was carried out on Attu.

In May and June reconnaissance trips were conducted by the project leader to Attu Island to examine topographic features of the island, photograph potential salmon streams, determine logistical needs and the feasibility of a ground crew investigation.

Major ground investigation of salmon streams on Attu was conducted late July through early September. The ground crew study team consisted of two seasonal Fishery Biologists equipped with two three wheel motorcycles and an inflatable raft. The Coast Guard Loran Station Attu, was the base for field studies.

Logistical support for the Attu study was supplied by the U.S. Coast Guard Loran Station. Transportation of personnel and equipment was provided by the U.S. Coast Guard Support Station Kodiak via C-130 aircraft. One member of the field party was flown to Attu aboard a

commercial Reeves flight in early August, stopping at Shemya to investigate a stream for a potential salmon transplant requested by the U.S. Air Force.

RESULTS

Akutan Island

The Akutan Harbor stream was the only stream surveyed in the Kreznitsin Islands (App. Figure 1). This was the only stream which had previously documented runs of pink salmon. Additional surveys in this area were deferred in order to conduct higher priority work on Unalaska Island. This decision was based on the low potential for significant numbers of salmon in adjacent creeks. If time and funds allow this area will receive a more intense effort next season.

Unalaska Island

Unalaska is the major salmon producing area in the Aleutians. There is little potential for fishing of a similar magnitude anywhere in the Aleutians. Several excellent pink runs were observed on the southwestern panhandle from McIver Bight to Surveyor Bay and in Beaver Inlet at Final Bay and Tanaskan Bay. A good run of sockeye salmon occurred at Kashega Lakes, the only sockeye system of consequence in the Aleutian Chain. These relatively unexploited streams could warrant an expansion of the present fishery (App. Figure 2).

Streams on the northwest flank of Makushin Volcano are too steep to sustain salmon. With few exceptions, runs in Beaver Inlet were small, ranging up to a few thousand pinks. The southeast portion of the island had for the most part small pink runs and a few small runs of sockeye salmon. The Pacific side of the panhandle from Kululiak to Surveyor Bay had only one stream (Ridding Cove) with more than 5,000 pinks. No major chum runs were noted on the island.

The average weight of pink salmon sampled was 3.4 pounds while sockeye averaged 5.5 pounds. The predominate age class (87%) of the sockeye sampled at Kashega Lakes were 1.3's (Table 3). 1/

Umnak Island

The northern half of Umnak is essentially sterile for salmon. Several of the streams appeared to be good salmon streams but had little or no salmon or Dolly Varden. Water temperatures were well within the range for salmon, most streams were spring fed and open at the mouth, vegetation was present in the stream beds and the water was essentially clear with no foul odor or "chemical taste". It would appear that some factor associated with the drainage from the Okmok Volcano restricts fish from the streams, only 2 streams on the northeast end of the Island had any significant numbers of salmon.

The majority of the salmon streams are located on the southern half of the island. Russian Bay, Amos Bay, Driftwood Bay, Okee Bay and Inanudak Bay (App. Figure 3). Pink salmon sampled at Sheep Creek on Umnak weighed on the average of 3.9 pounds. No sockeye salmon were sampled due to the fact that the only sockeye system of any size was the Nikolski Village Lakes. We were unable to obtain a good count of sockeye salmon in this system and did not wish to jeopardize the spawning potential of the few fish observed.

The streams in the Nikolski Bay, Sandy Beach area have relatively small runs of pinks, sockeye and a few coho which have been historically utilized for subsistence by Nikolski Village. Nikolski is the oldest continuously inhabited village in Alaska. The runs in the vicinity of the village could easily be jeopardized by a commercial fishery. These streams would have little or no commercial value during most years.

1/ Age data utilize the "European Technique" of designating growth periods, i.e.: A 2.3 fish would have completed 2 years of freshwater growth and would be returning to its native stream after its third year in saltwater.

The people of Nikolski have expressed a strong interest in protecting their local salmon runs. Salmon were transported for several years by hand around a faulty culvert in order to maintain the stocks in Sheep Creek. Subsistence use of the village sockeye run in Umnak Lake is reported to be tightly controlled by the village elders.

Amlia Island

The majority of Amlia Island has very poor salmon streams. The steep topography, small drainages and exposed stream mouths create short streams with marginal salmon habitat (App. Figure 4). The majority of reasonably productive salmon runs are on the northwest side of the island about 20 miles east of USGS marker Round 290 (vicinity of Hungry Bay). Twelve of the larger streams averaged 10,000 pink salmon, with the largest run of 18,000 fish occurring at Hungry Bay. If a fishery were to develop at Atka it might be able to utilize these runs. Only two streams on the south side of the island have the potential for a small harvest. The majority of the runs on Amlia in other than peak years would be expected to be insignificant. Harvesting of these systems could be difficult due to the lack of an all weather anchorage on the north side of the island.

A few small sockeye runs were observed but no fish were sampled. There were also a few small runs of chums noted. None of these runs would be expected to have commercial potential. Pink salmon sampled were considerably smaller than on Atka, weighting an average of 3 pounds.

Atka Island

Atka Island probably has the greatest potential for development of a salmon fishery in the Aleutians west of Unalaska. There are several moderate to good runs of pink salmon located on the south side of the island from Explorer Bay to Cape Utalug, and on the north/central portion of the island from Blue Fox Bay to Korovinski Lagoon. The northernmost stream in Korovinski Lagoon (one of the best pink systems west of Unalaska) had an escapement of 86,000 to 100,000 pinks (App. Figure 5). An estimated

potential harvest of 300,000 to 400,000 pinks might be achieved from the island during a season with a magnitude of returning salmon similar to 1982.

Atka also had the largest sockeye salmon run west of Unalaska. This run of 2,500 fish was located in the west arm of Deep Bay. The largest run of chums (1,350 fish) in the Aleutians was observed in stream #305-32-270. The largest number of coho observed during the project were in the northeast stream in Banner Bay. Several streams other than those noted in the appendix were reported to have coho salmon. This study may have either been too early to index these streams or the runs may have been weak this year. The number of sockeye salmon in Korovin Lake was less than expected. This may have been a function of timing of counts, reduced visibility, or simply a poor run strength.

This years field work would indicate that even though the largest numbers of sockeye, chums and cohos west of Unalaska occur at Atka, they probably would only be harvested incidentaly to pinks. If funds were available and weather allowed, it would be advisable to attempt to further investigate some of these runs in the future.

Pink salmon sampled at Atka were the largest in the Aleutians weighing an average of 4.2 pounds in a sample of fresh fish from Korovinski Lagoon. A sample of pinks taken in Koverof Bay, though thin and spawned out, weighed an average of 3.4 pounds. Chums sampled at Korovinski Lagoon weighed an average of 7.6 pounds, but were actively spawning and had obviously lost weight. Sockeye salmon sampled from multiple lake systems east of Wall Bay weighed an average of 3.4 pounds and were 50% 1.2 age class. These fish, though colored and spawning, were shorter and smaller than in the rest of the chain. Sockeye were not sampled from Korovin Lake because of the low number of fish observed.

The Atka Village has traditionally been a subsistence based village. Harvest of local salmon runs has been supervised by local elders. They have been active in attempting to re-establish a local coho and pink salmon run which was nearly eliminated when a culvert under the runway was washed out.

There is a strong interest on the part of the people of Atka Village to develop a commercial fishery in their area. They have recently completed rebuilding their runway and are planning repair of the military dock in Nazan Bay. Engineering studies are being completed in preparation for installing a hydroelectric generation system. They also have discussed installing a small processing facility with a flash freezer, as well as a fuel dock and potentially a fishery supply store.

Eastern Anderanof Islands

This group of islands lie east of Adak and west of Atka. They include Igitkin, Tagulak, Chugul, Umak, Little Tanaga, Great Sitkin and Kagalaska. Only Great Sitkin and Kagalaska had small runs of salmon which exceed a thousand pink salmon (Table 1). Quail Bay on Kagalaska was sampled for both pink and sockeye salmon (App. Figure 6). The pinks, which were at least 2 weeks past their peak, weighed an average of 2.9 pounds, while the sockeye were "ocean bright" and weighed only 4.4 pounds. The dominant age class of these sockeye were (57%) 2.2. The Galas Point system was reported to have a run of coho as well as pinks and reds, however, only 275 sockeye salmon were observed.

Adak Island

Adak Island follows Atka Island in terms of salmon potential (Table 1). The major streams on the island are located on the north end of the island. Only one of significance (7,700 pinks) is located on the south side at Hidden Bay. Four of the five major streams are on the U.S. Naval Station. The fifth, Cannet Cove, is the southern boundary of the facility. These five streams account for the majority of the salmon on the island each averaging 53,000 pinks (App. Figure 6).

Runs of pink salmon on Adak have been generally increasing since they were first monitored by the U.S.F.W.S. in 1977 (Table 5). Local residents have mixed opinions as to relative strength of odd or even year runs. It does appear however that like Unalaska Island the runs can fluctuate

greatly. The peak of the runs in recent years has occurred near the last week of August.

Finger Bay stream is the dominant run (100,000 pinks) on the island. It has only 5/8 to 3/4 of a mile of spawning area. Fish sampled from this stream weighed 3.5 pounds after having been in freshwater one to two weeks. North Hidden Bay has the only significant run of pinks (7,700) on the south side of the island. This system also supports the only run of sockeye (821) of consequence on the island. A sample of these sockeye, which were "colored up" and actively spawning, averaged 5.3 pounds. These fish, like those at Kagalaska, were primarily composed of (54%) 2.2 age class individuals. The Kokanee population in Lake Andrew was not sampled.

Development of a commercial fishery at Adak would be difficult. The U.S. Navy cannot provide any support to a commercial operation in the area. There is restricted access to the Air Station and the majority of the all weather anchorages are closed to civilian vessels. Any fishery would have to be completely self supported and be based out of Dutch Harbor, or locations other than the Adak Naval Station.

Kanaga Island

Kanaga Island, for its size, is one of the least productive islands for salmon in the chain. It has very little salmon habitat, most of the streams terminate in waterfalls at the beach line. Only three systems on the island have any appreciable number of pink salmon. The largest run of 12,700 fish occured in Kanaga Bay (App. Figure 7). A sample of spawned out pinks weighed an average of 2.3 pounds. This figure should not be used for comparative purposes. Spawning on Kanaga probably reached its peak during the second week of August. The lake and stream in Chunu Bay (#307-16-240) was not surveyed due to high winds. Judging from the topography of this end of the island, salmon access may have been blocked. Weather prevented re-examination of this system on the return to Unalaska Island.

Tanaga Island

Tanaga, like Kanaga, is also very unproductive for its size. Nearly 85% of the salmon on the island were located in two streams. The major run of fish, nearly 40,000 pink salmon, was located in stream #307-23-90 in Tananaga Bay (App. Figure 7).

Two samples of pinks were taken. In the first sample from Cable Bay most of the fish in the stream were spawned out; therefore, weights were only taken on fresh fish, their average weight was 3.8 pounds. A fresh run of pinks was sampled from a stream located in Twin Bays; these fish weighed an average of 3.84 pounds. Tanaga is similar to many of the Aleutians in respect to variable timing of pink salmon runs, although most returning runs probably peaked in the second or third week of August.

Amchitka Island

Amchitka is the poorest island of its size for salmon in the chain. The drainages on the south half of the island are very short emanating from marshy tundra and a few small ponds. The largest salmon stream on the island is located in small mountains on the north west end of the island (App. Figure 8). Creeks #308-31-80 & 70 had only 620 pink salmon. The next largest run on the island was 130 pinks. Biologists for the Atomic Energy Commission also observed small numbers of pink and coho salmon in other small creeks on the island.

The average weight of pink salmon sampled was 2.6 pounds. While 40% of the fish in the stream were "spawn outs", the weight data was taken from the freshest fish. The estimated peak of spawning for pink salmon on Amchitka was the third to fourth week of August.

Semisopochnoi Island

While two other drainages on Semisopochnoi appear to be able to support pink salmon, only Fenner Creek on the south side of the island had a run of fish (App. Figure 8). This run of 400 pinks probably peaked near the

end of August. Fenner Creek is a marginal salmon stream at best; it is steep and short, blocked at one half mile by 30 foot falls. Salmon from this stream were nearly all spawned out, therefore, no weight data was taken.

Kiska Island

One major run of 31,900 pink salmon in Gertrude Cove dominated the salmon returns on Kiska. There are several small runs of pinks on the island with four runs averaging near 2,800 fish (App. Figure 9). The peak of the pink runs was during the third and fourth week of August. The average weight of these fish sampled was 3 pounds. These late run fish were fairly fresh, compared to other streams, having no fungus growth on their bodies. Eight sockeye salmon, twenty coho and one chum salmon were also observed but were not sampled.

Attu Island

Attu received an extensive investigation of approximately 40% of its salmon streams. Rough topography prevented the field party from reaching the Nevidiskov River, Etienne Lake and the northern portion of the island west of Holtz Bay (App. Figure 10). Weather further delayed the research vessel and prevented an aerial survey of the inaccessible areas of the island. The field party, as a result, devoted themselves to conducting an intensive investigation of the streams on the east end of the island. They did an excellent job and utilized the short field period in a very commendable manner.

Pink salmon were again the dominant species of salmonids on this island. The major runs that were monitored were the Henderson and Peaceful rivers, with 48,000 and 33,000 fish for their respective peak counts (Table 2). The Cories/Canirco and Lake Nicholas systems also had good runs of nearly 12,500 pink salmon each. The average weight of "bright" pinks sampled in the Peaceful River was 3.4 pounds. This average weight might be slightly high as it contained 68% males.

Both the timing and magnitude of pink salmon runs is highly variable; from stream to stream and from year to year. Runs in Massacre Bay have been reported to vary by as much as a month. Pinks usually begin to enter the streams in late June and early July. Davenport reported in 1979 that the runs usually entered first at Casco Cove and then progressively into the Peaceful and Henderson rivers. In 1978 pinks did not enter the Henderson until September. This year pinks were observed in the Peaceful on the 1st of July and peaked by the 19th of August. The peak of runs occur in most of the systems monitored between mid August to the first week of September.

The peak counts of sockeye salmon were 563 fish (Table 6). Lake Nicholas was the largest run (530) in the study area. The counts on this lake are very conservative, as the investigators were unfortunately restricted to foot surveys of the lake shore. Aerial or boat surveys would provide a better assessment of the strength of the sockeye run in this 200 acre lake. Otoliths taken from carcasses at Lake Nicholas were predominantly of the 3.3 year class. Only 14 sockeye were observed in Lake Canirco sections of the Lake Cories/Canirco drainage. The majority of these fish were 1.3's. This system was once an important source of subsistence sockeye salmon to the old village of Attu.

The peak counts of coho were only 15 adults in three streams. The Henderson River had the largest run of 12 adults. Coho fry, fingerlings and smolt were observed in seven additional streams (Table 7). Runs of a few hundred adults have been reported in the past from Casco Cove, the Peaceful and Henderson rivers. The small numbers of coho present this season negated biological sampling. Returning runs of coho may be highly variable or there may well have been errors in identification in the past on the part of untrained observers. Coast Guard personnel report that coho usually weight 5-6 pounds with a maximum weight of 10 pounds.

In order to complete the assessment of the remainder of the island it will be necessary to survey a minimum of 16 additional streams and lake systems. The most expedient means would be by aerial survey. This survey could be conducted with a small fixed wing aircraft such as a Super Cub or a

small helicopter. The U.S.C.G. has offered to assist this project by transporting either aircraft on a space available basis to Attu via C-130. A less desirable but lower cost alternative would be to utilize a field party equipped with mountaineering gear in order to traverse the rugged terrain of the island.

SUMMARY

Pink salmon are the predominant species of salmon in the Aleutians (Table 1). Small runs of sockeye, chums, and coho salmon occur sporadically throughout the chain (few of these runs would be expected to be of commercial importance). No streams were found which supported king salmon. Development of any Aleutian salmon fishery will be primarily dependant on pink salmon.

The runs of sockeye and coho salmon in the vicinity of the Nikolski and Atka villages are very important for local subsistence purposes. While the major runs of pink salmon at Massacre Bay on Attu and Finger Bay on Adak are the focus of sport fisheries for local military personnel. Development of a commercial fishery in these areas should take these prior uses into account.

Pink salmon runs are cyclic and their magnitude and timing can fluctuate considerably from year to year and from stream to stream. In the eastern Aleutians (specifically Unalaska Island) they follow an even year cycle (Table 4), while in the western Aleutians there is some evidence that they may follow an odd year cycle.

The majority of the Islands in the Aleutian Chain do not have enough salmon to support a major harvest. The exception to this statement is Unalaska Island.

Excellent runs of pink salmon were observed in the Southwest Panhandle of Unalaska Island. This area could have a harvestable surplus of 3-400,000 pink salmon, and a small harvest of sockeye salmon. These runs would warrant an expansion of the present Unalaska fishery during years with similar returns to this season. This area has been virtually unexploited to date. This fishery might also include, in peak years, some of the productive streams on South Umnak Island.

While there is no potential for a major fishery west of Unalaska, there are large enough runs of pink salmon to support development of a small scale fishery at Atka Island. This fishery would be focused primarily in the central portion of the island, and possibly northwestern Amlia.

There are a few streams on Adak Island which would have the potential for a harvest during peak years. However, with one exception these streams are on the U.S. Naval Station. The Navy will not be able to supply any support for commercial fishing operations.

When compared with other salmon fisheries in the state, the number of salmon available in the Aleutians is very small. This study was conducted during an optimal year for pink salmon abundance and may represent maximum escapements of unexploited stocks. Many of the streams from Adak Island east to Unalaska were virtually "plugged" with spawning salmon.

The development of a salmon fishery in the Aleutians will be influenced by other than biological factors. Perhaps the most significant problem will be overcoming marketing difficulties. The logistic problems for any development will be significant: There are no support facilities west of Dutch Harbor. All-weather anchorages are few and far between. The distance separating the potential fisheries combined with highly variable run strengths and timing will provide additional difficulties for harvesting and transporting the catch.

There is a need to conduct addition research to conclude this project. Attu Island field work this season was restricted to roughly 40 percent of the Island's streams. Additional field work and probably aerial surveys will be necessary to complete the evaluation of this major Island. There is a strong potential that Attu and Agattu Islands may have an odd year cycle; if this is the case, assessment next season would more accurately reflect the commercial potential of the Island.

Additional aerial surveys and a small scale stream sampling program should be conducted in the locations where commercial concentrations of salmon

were located this year. Specifically the Southwest Panhandle of Unalaska, the southern half of Umnak, northern half of Adak, the central portion of Atka and Northwestern Amlia Island. By examining these areas during an "off cycle" year a much better understanding of the Aleutian Salmon will be gained.

DISCUSSION OF EXPENDITURES

The majority of the legislative allocation for this program was expended this season to accomplish a comprehensive examination of the Aleutian Islands salmon streams. It was apparent during the planning phase of this project that the weather combined with the distances involved could prevent its completion.

Considering the high costs involved in chartering a support vessel and helicopter it was decided to maximize the use of these units. The surveys were conducted on a prioritized basis on the islands with the greatest potential for salmon, beginning with Unalaska.

Attu Island, however, was high on the prioritized list of islands. It was reported to have similar run timing to Unalaska Island. These factors led to equipping and deploying of an additional field crew at Attu. Their work could have then been supplemented with aerial support from the helicopter on the contingency that weather allowed it to reach Attu within the time restraints of the project.

Delays due to adverse weather prevented the research vessel and helicopter from traveling beyond Kiska Island. These delays resulted in the need to extend the helicopter and vessel charters as well as the purchase of additional fuel at Adak. These additional expenditures resulted in essentially complete utilization of the project appropriation this season.

The figures listed below do not reflect the total cost of the project. Project costs were reduced wherever possible by utilizing field equipment, outboard motors, and seasonal time assigned to other Westward Region projects. U.S. Coast Guard support for transportation and housing further reduced project expenditures.

ALEUTIAN ISLANDS SALMON STUDY EXPENDITURES

Line Item	Expenditures
100	18,778.14
200	1,322.00
300	158,545.92
400	26,358.69
500	5,673.50
Total	210,678.25

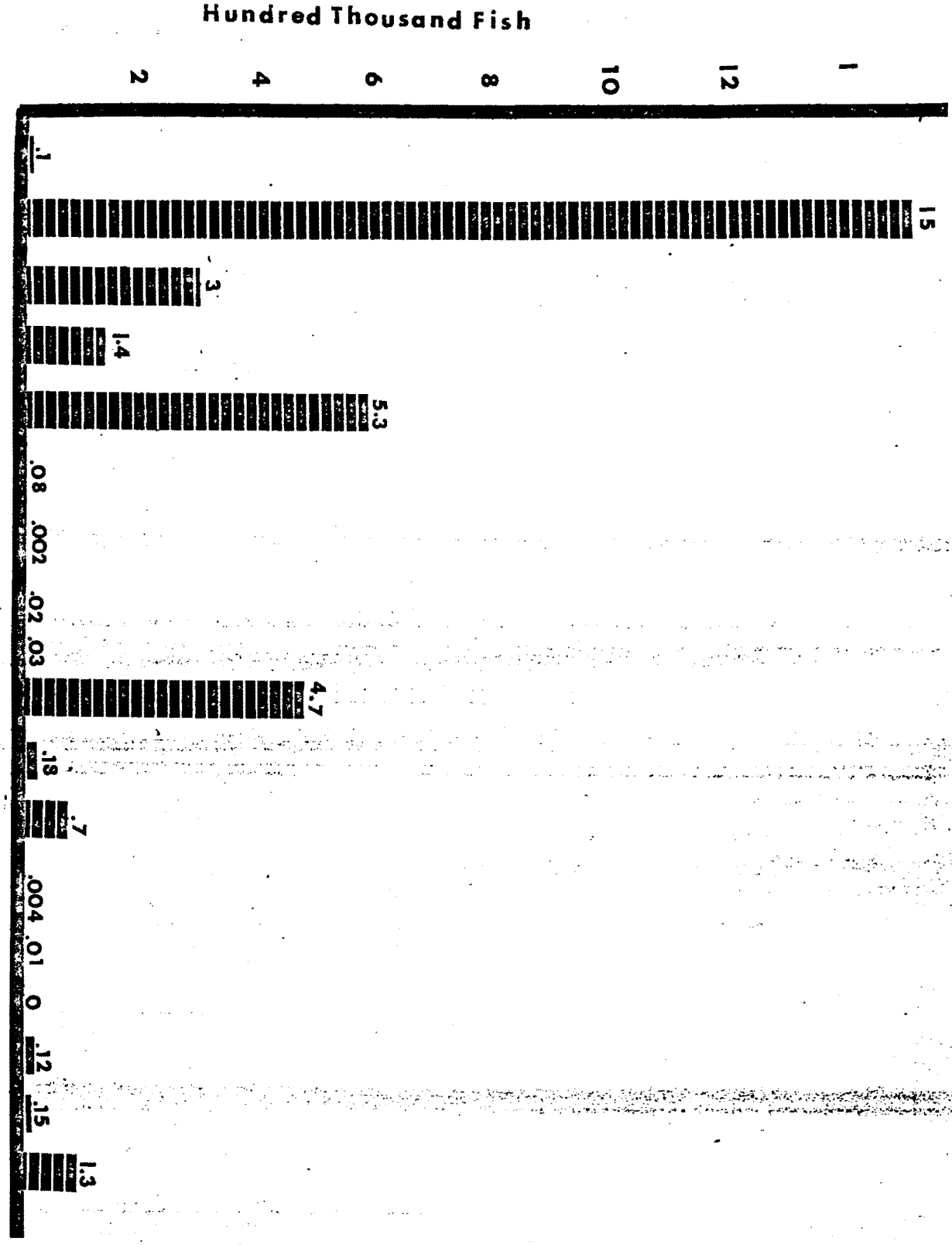


Fig. 1 Maximum Pink Salmon Counts

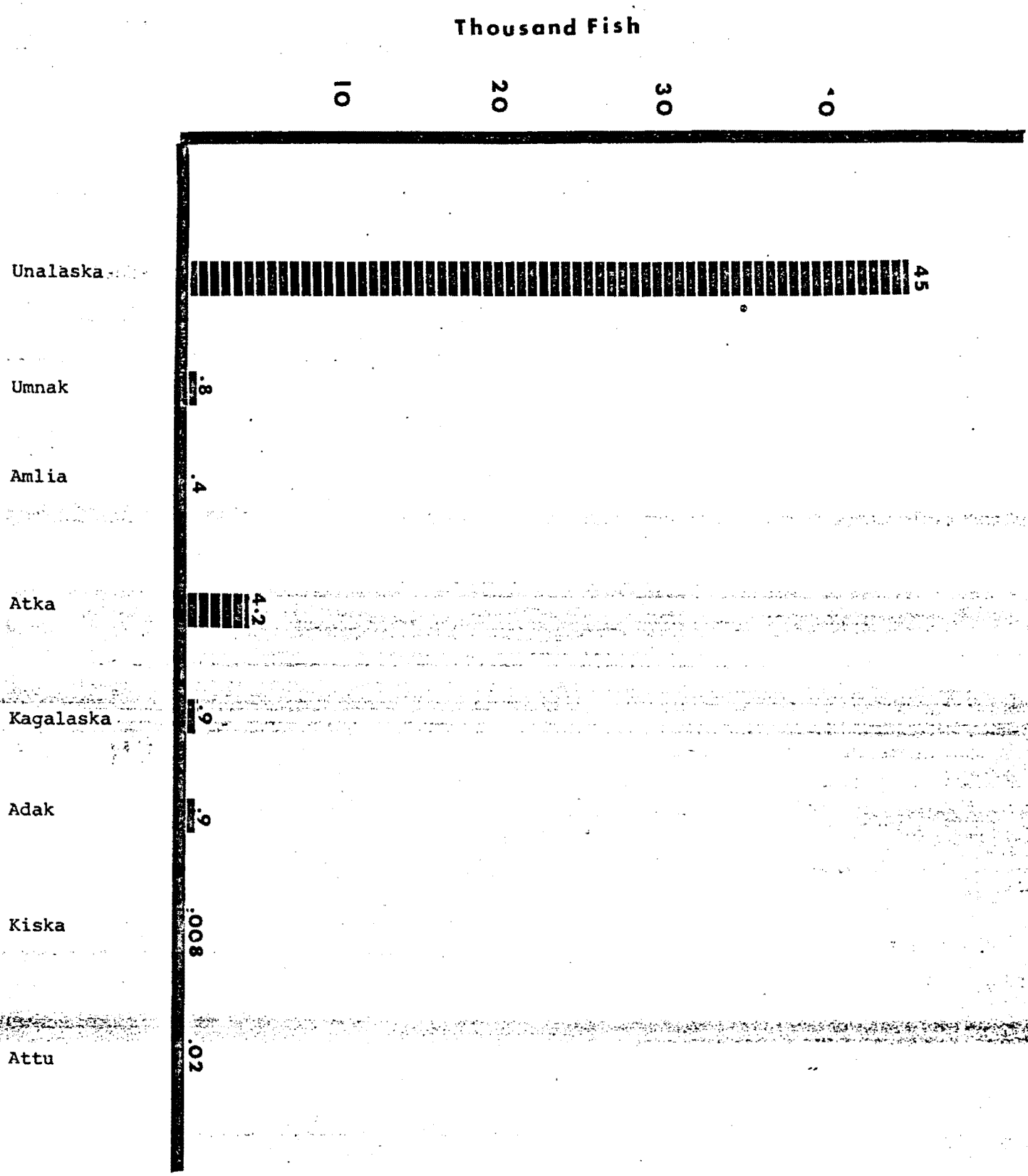


Fig.2 Maximum Red Salmon Counts

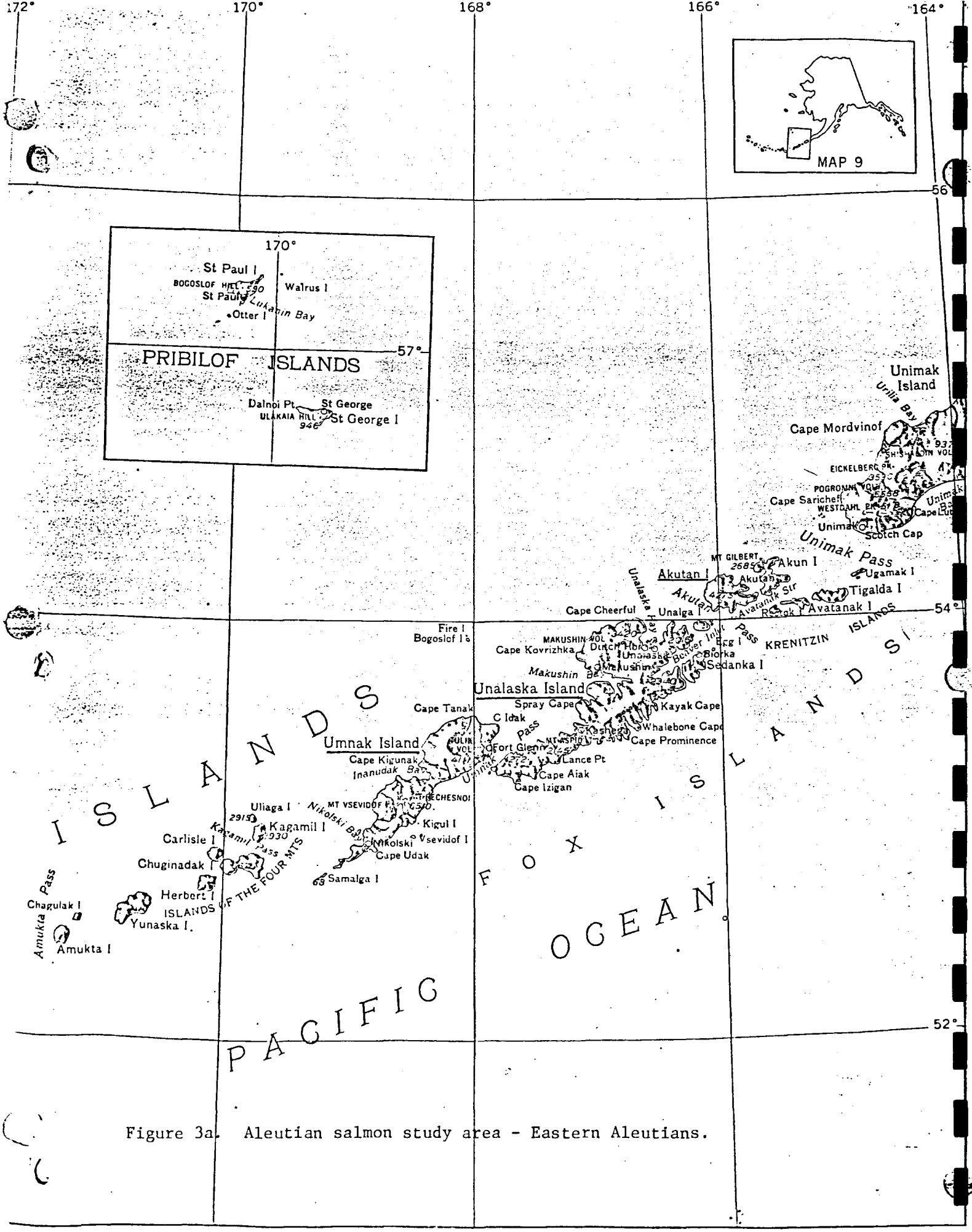


Figure 3a. Aleutian salmon study area - Eastern Aleutians.

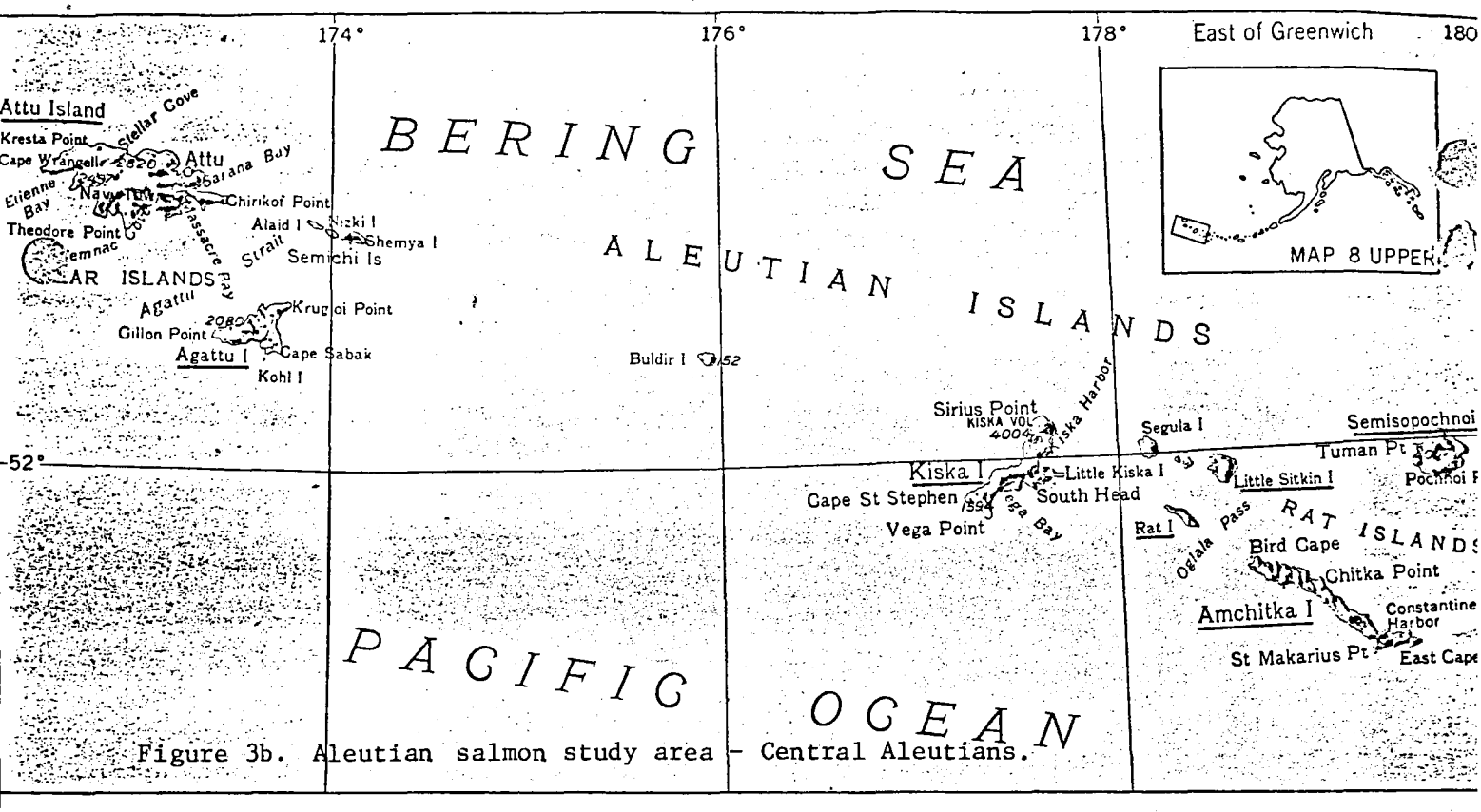


Figure 3b. Aleutian salmon study area - Central Aleutians.

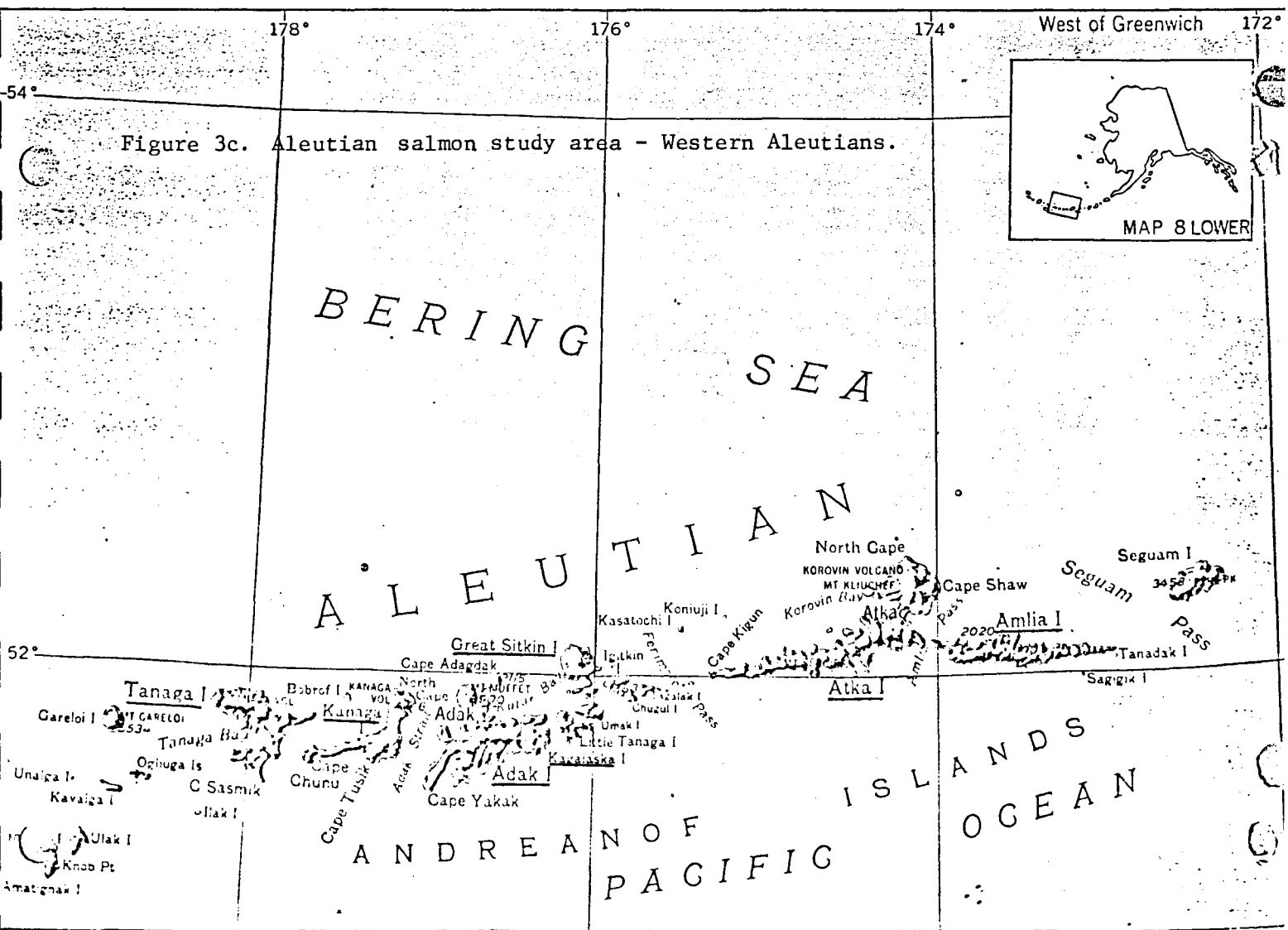


Figure 3c. Aleutian salmon study area - Western Aleutians.

Table 1. Summary of maximum salmon counts by species, by island. 1/

Island	Pinks	Reds	Chums	Coho
Akutan	10,500 2/	-	-	-
Unalaska	1,541,317	44,995	100	300
Umnak	295,385	805 3/	0	143
Amlia	138,258	453	772	0
Atka	578,086	3,971	1,484	825
Igitkin	0	0	0	0
Great Sitkin	7,720	0	0	0
Umak	230	0	0	0
Little Tanaga	1,550	0	0	2
Kagalaska	3,310	975	0	0
Adak	362,438	993	0	2
Kanaga	18,448	0	0	0
Tanaga	68,585	0	0	6
Semisophochnoi	400	0	0	0
Amchitka	1,248	0	0	0
Rat Island	0	0	0	0
Kiska	43,393	8	1	20
Agattu	15,000 4/	0	0	-
Attu	133,589	220	1	14

1/ Most streams surveyed between 8/12 and 9/17 for specific dates of specific stream survey see appendix tables.

2/ Harbor Creek only stream surveyed.

3/ Includes estimated abundance of reds in Village Lake at 670 based on number of spawning reeds and poor visiblity at time of survey.

4/ Island not surveyed, based on stream morphology observations made by ADF&G staff and U.S.F.W.S. ornithogists observations. Estimated escapement at 10-20,000 pink salmon, possibly a few hundred coho.

5/ Partial survey opproximately .4 of island potential counts may be low for Attu and Aggatu, they may have an odd year cycle for pinks as occurs in Asia.

Table 2. Average weight by species of Aleutian salmon. [1/]

Island	Average Weight in Pounds Pinks	Reds	Chums	Date	Comments
Unalaska	3.35	5.5	-	8/15 & 16	Reds colored and spawning.
Umnak	3.89	-	-	8/18	Gillnet may have selected for for larger fish. Later samples taken w/spear or dip net.
Atka	4.24	-	7.59	8/23	Chums actively spawning.
	3.26	3.4 [2/]	-	8/25	Pinks spawning. Thin reds colored and spawning.
Amlia	3.06	-	-	8/24	Smaller fish than Atka.
Kagalaska	2.90	4.37 [3/]	-	8/29	Pinks 3 weeks in freshwater, reds bright.
Adak	3.49	-	-	9/1	Pinks in freshwater 1-2 weeks.
	-	5.28	-	9/2	Reds colored and spawning, females "purple".
Kanaga	2.34 [2/]	-	-	9/5	Fish spawned out, do not use for comparison.
Tanaga	3.8	-	-	9/5	Most fish spawned out. Weights only on fresh fish.
	3.8 [4/]	-	-	9/6	"Fresh fish".
Amchitka	2.59 [5/]	-	-	9/11	40% spawnouts, data only from fresh fish.
Semisopochnoi	No Data	-	-	9/12	Fish spawned out.
Kiska	2.95	-	-	9/9	
Attu	3.4	-	-	7/29 & 8/3	"Ocean bright", taken with rod and reel.

1/ Based on 50 individuals unless otherwise noted.
2/ Based on a sample of 10.
3/ Based on a sample of 25.
4/ Based on a sample of 9.
5/ Based on a sample of 38.

Table 3. Age classes of Aleutian salmon based on otolith samples.

Location	Date	Species					
Kashega Lakes Unalaska Is.	8/16	Red	1.3 40 (87)	2.2 1 (2.2)	2.3 5 (10.8)		Age Class Number Percent
Korovin Lagoon Atka Is.	8/23	Chum [1/]					Age Class Number Percent
Tripple Lakes Atka Is.	8/25	Red	1.2 5 (50)	1.3 2 (20)	2.2 2 (20)	2.3 1 (10)	Age Class Number Percent
Quail Bay Kagalaska Is.	8/29	Red	2.2 13 (56.5)	2.3 6 (26.1)	3.2 3 (13)	3.3 1 (4.4)	Age Class Number Percent
Hidden Bay Lake Adak Is.	9/2	Red	1.2 2 (4.2)	2.2 26 (54.2)	1.3 5 (10.4)	2.3 15 (31.2)	Age Class Number Percent
Lake Nicholas Attu Is.		Red [1/]				3.3 [2/] 35 (80)	Age Class Number Percent
Lake Corries Attu Is.		Red [1/]					Age Class Number Percent

1/ Otoliths not read at this date.

2/ Incomplete sample.

TABLE 4

ALEUTIAN ISLANDS AREA SALMON CATCHES
(In Thousands of Fish)

YEAR	KINGS	REDS	COHOS	PINKS	CHUMS	TOTAL
1911	0	9.3	0	0	0	9.3
1912-1915	NO CATCH REPORTED					
1916	0	76.5	1.2	180.3	0.1	258.1
1917	0	70.4	3.8	0.6	23.1	97.9
1918	0	55.2	4.4	75.6	0	135.2
1919	0	3.9	0.8	4.0	0	8.7
1920	0	10.1	2.8	0	0	12.8
1921	NO CATCH REPORTED					
1922	0	14.0	0	0	0	14.0
1923	NO CATCH REPORTED					
1924	0	24.9	0	673.8	0.1	698.8
1925	0	18.6	0	3.8	9.1	31.5
1926	0	1.3	0	521.7	7.8	530.8
1927	0	17.3	0	334.6	0	351.9
1928-1950	CATCHES INCLUDED WITH SOUTH PENINSULA CATCHES OR NO CATCHES REPORTED					
1951	0	11.7	0.4	0.5	94.5	107.1
1952	0.2	42.8	0	31.8	25.7	100.5
1953	0	4.3	0.5	69.2	0.8	74.8
1954	0	6.3	0.8	566.5	0.2	573.8
1955	0	12.6	0.1	31.1	0.4	44.2
1956	0	0.4	0	33.9	0	34.3
1957	2.3	27.3	0.1	0.5	13.9	44.1
1958	0	0.3	0	613.2	3.7	617.2
1959	0	6.1	0	12.0	0.1	18.2
1960	0	7.6	0	444.9	0.3	452.8
1961	0	2.7	0	94.0	0.2	96.9
1962	0	5.4	0.1	2,001.7	1.2	2,008.4
1963	0	4.5	0	93.9	0.3	98.7
1964	0	0.2	0	194.1	2.3	196.6
1965	NO FISHERY					
1966	0	1.0	0	63.5	0.7	65.2
1967	0	0.2	0	7.9	0	8.1
1968	0	2.0	0.1	902.8	0.8	905.7
1969	0	0.5	0	242.2	1.5	244.2
1970	0	0.2	0.1	672.5	3.3	676.1
1971	0	0.3	0	45.5	0.1	45.9
1972	0	0.1	0	2.8	0	2.9
1973	0	0.1	0	7.0	0	7.1
1974-1977	NO FISHERY					
1978	0	1.8	0	38.1	0	39.9
1979	0	12.2	0	539.4	0.2	551.8
1980	0	9.2	0	2,611.9	4.9	2,626.0
1981	0	5.4	0.2	302.8	6.6	315.0
1982*	0	2.7	0	1,447.8	6.2	1,456.7

* Prelminary

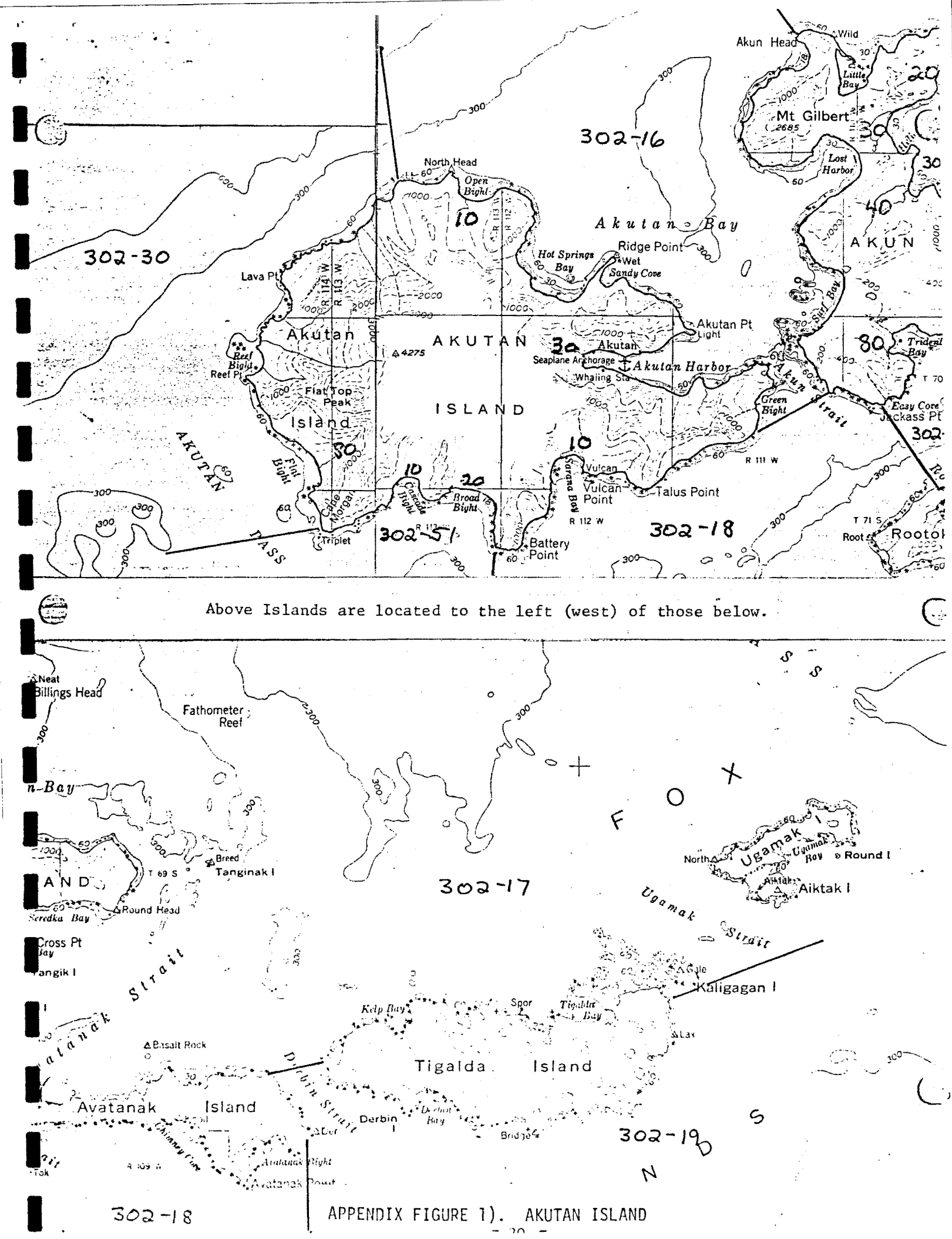
Table 5. Maximum fish counts, 1977-1982, near Adak Naval Station, Alaska. [1]

Species	Year	Finger Bay	NavFac Creek	Big Thumb Bay	Little Thumb Bay	Scabbard Bay
Pink Salmon	1977	2,300+				
	78	14,000				
	79					
	80	7,059	894		1	Few Remains
	81	38,000[2]	400			
	82	100,000	1,400	7,000	45,000	6,250
Silver Salmon	1977	2			1	
	78					
	79				[3]	
	80		4	1		
	81	1	[3]			
Dolly Varden	1977					
	78					
	79					
	80		36 (10-25 cm)	150	4	
	81	203 (15 cm)	45 (25 cm)			
	82					
Red Salmon	1977		20			
	78					
	79					
	80		2			
	81					

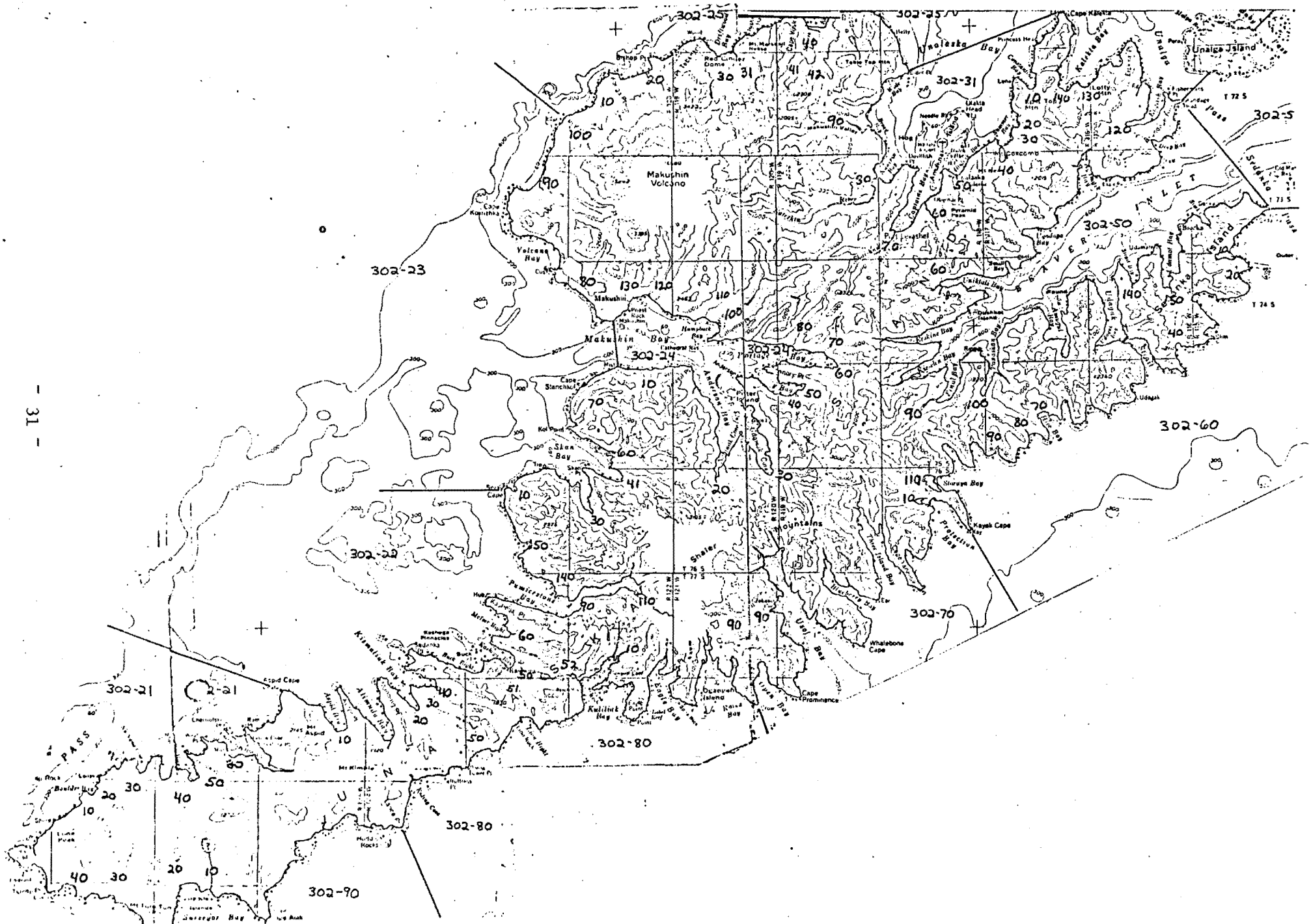
[1] Slater, L. 1981, U.S.F.W.S. Adak, Internal Report. 1981 stream survey and summary report.

[2] Possibly overestimated.

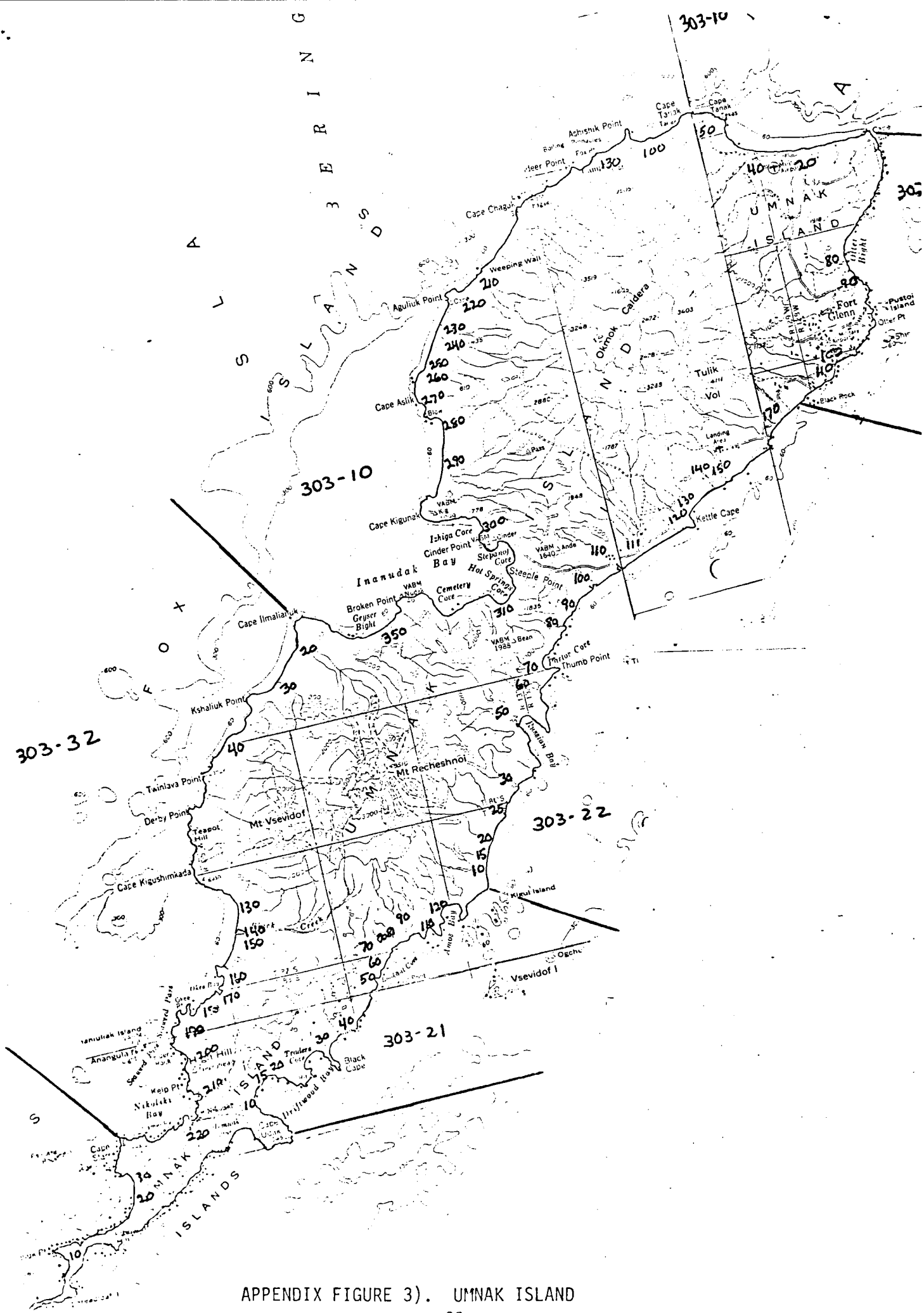
[3] Counts were conducted late in the run, so that few or no salmon were seen. However, general observations by U.S. Fish and Wildlife Service employees and fishermen confirmed the presence of fish earlier in the season.



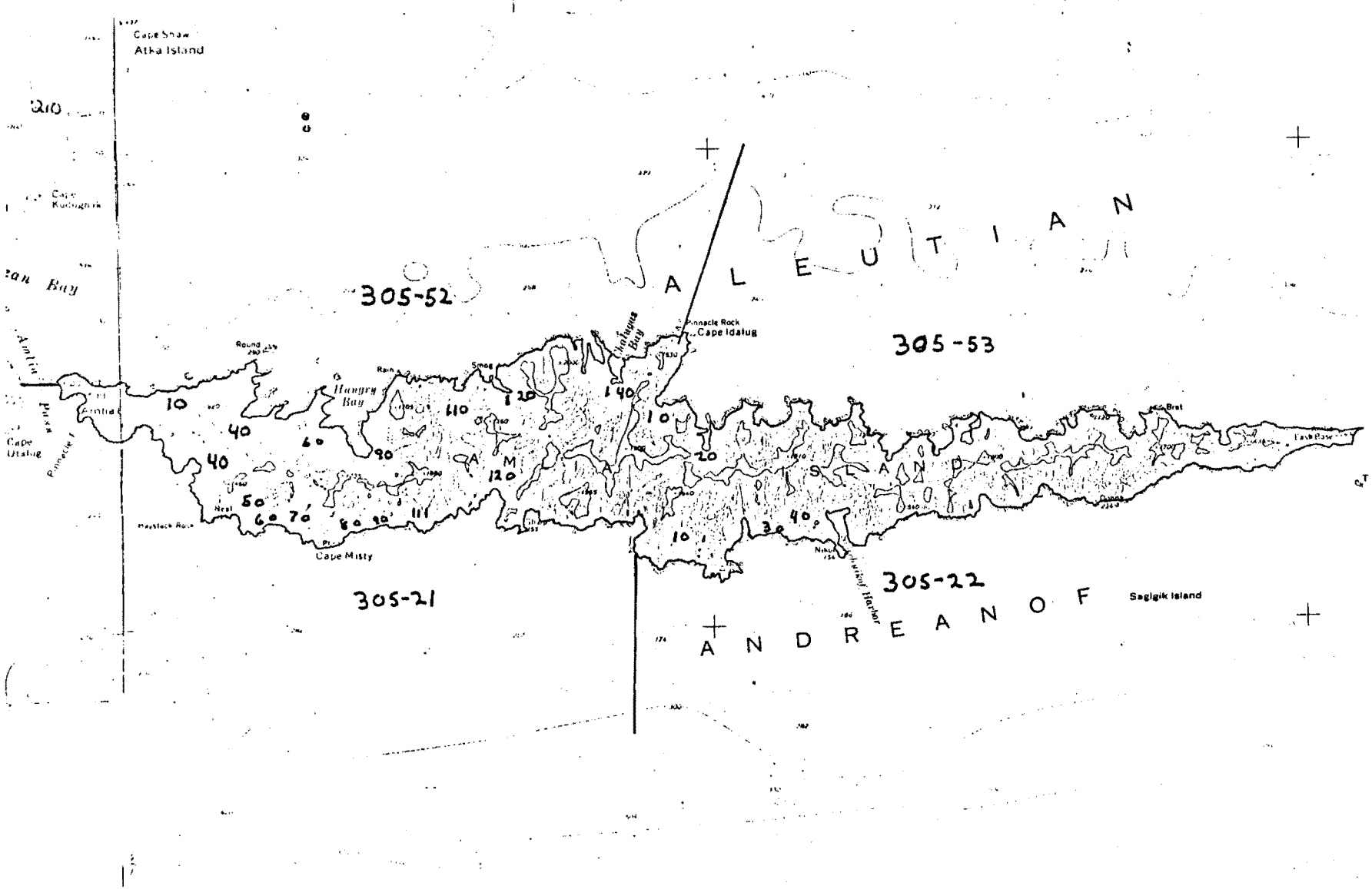
APPENDIX FIGURE 1). AKUTAN ISLAND



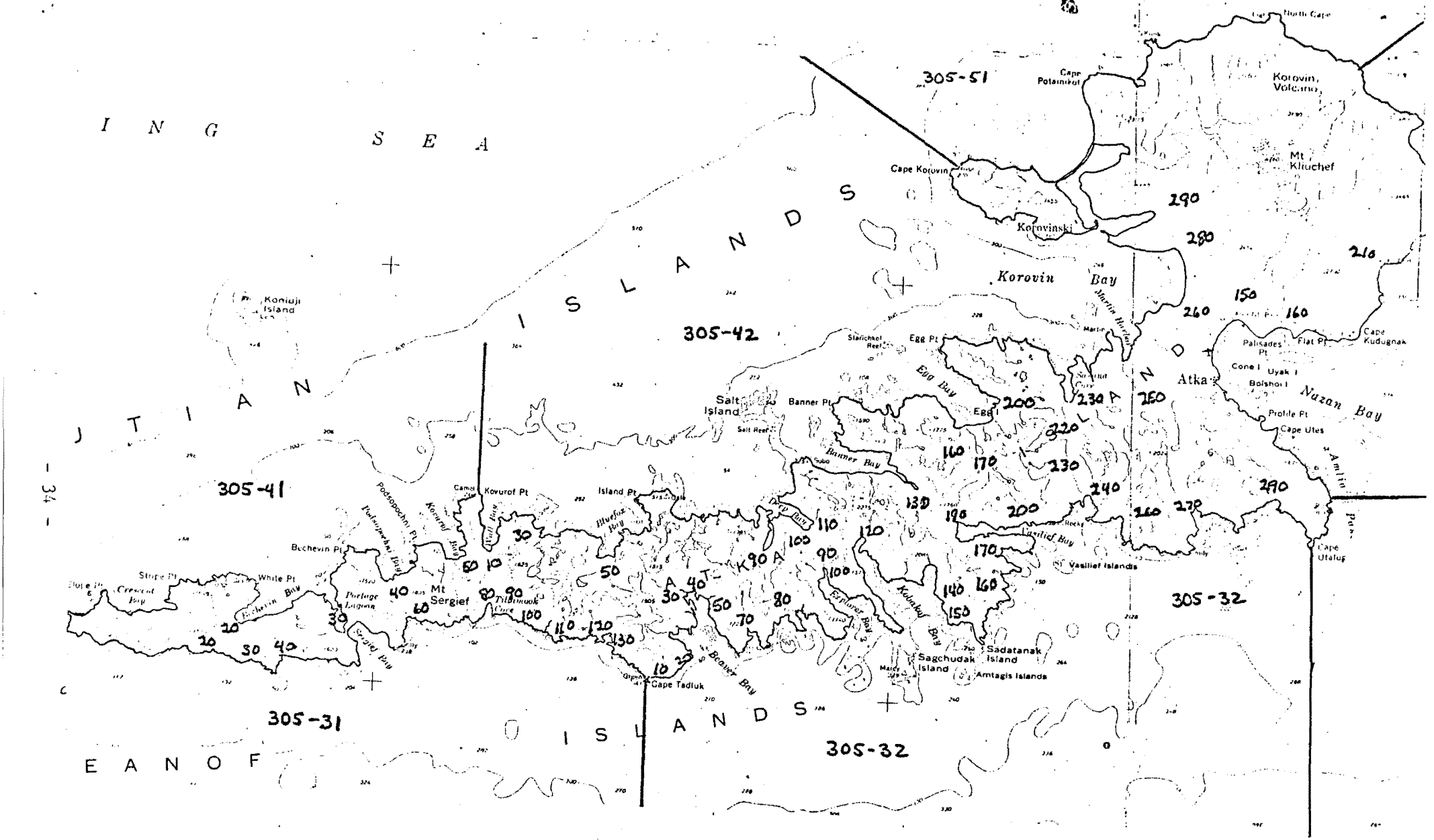
APPENDIX FIGURE 27. UNALASKA ISLAND



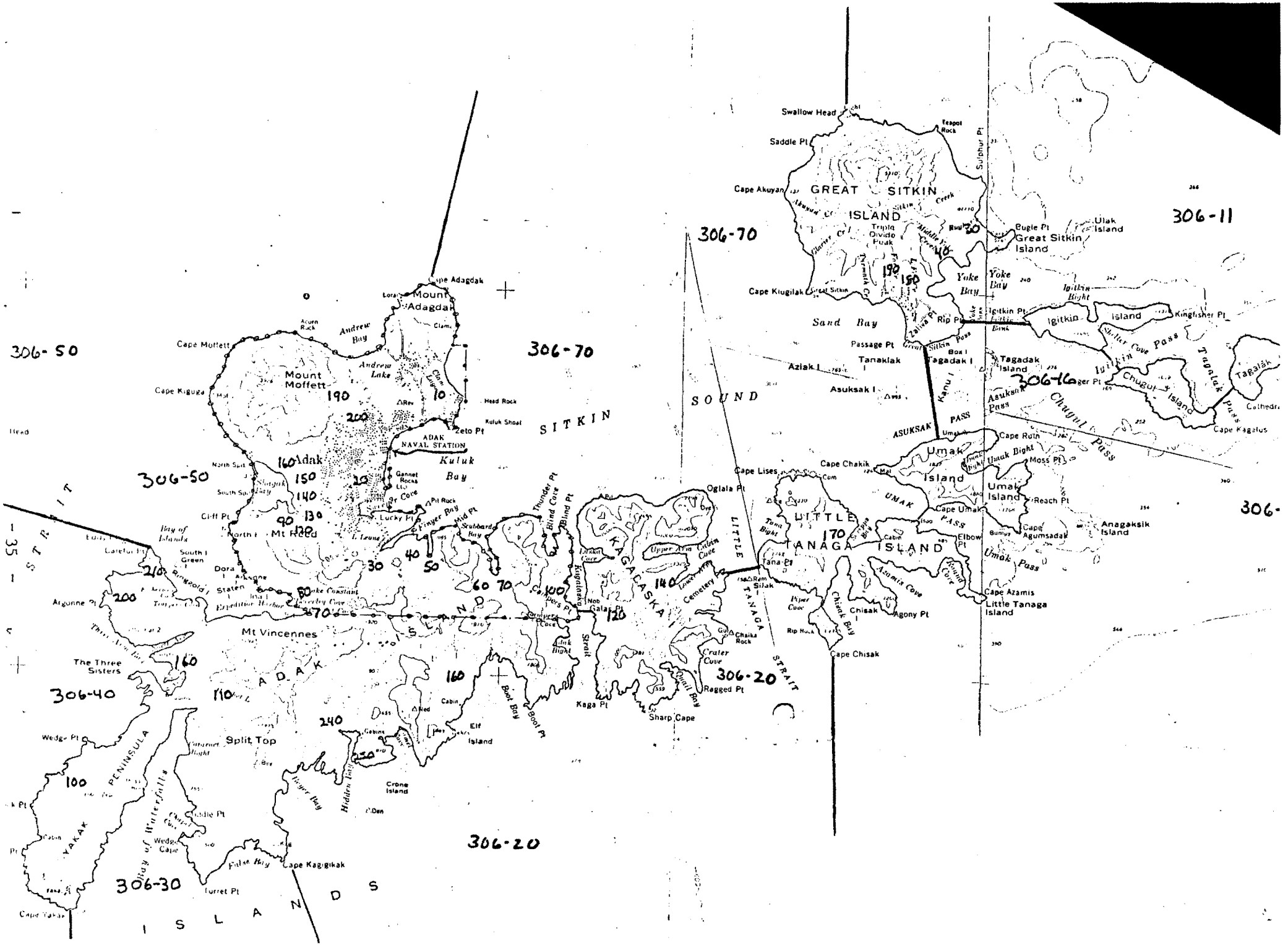
APPENDIX FIGURE 3). UMNAK ISLAND



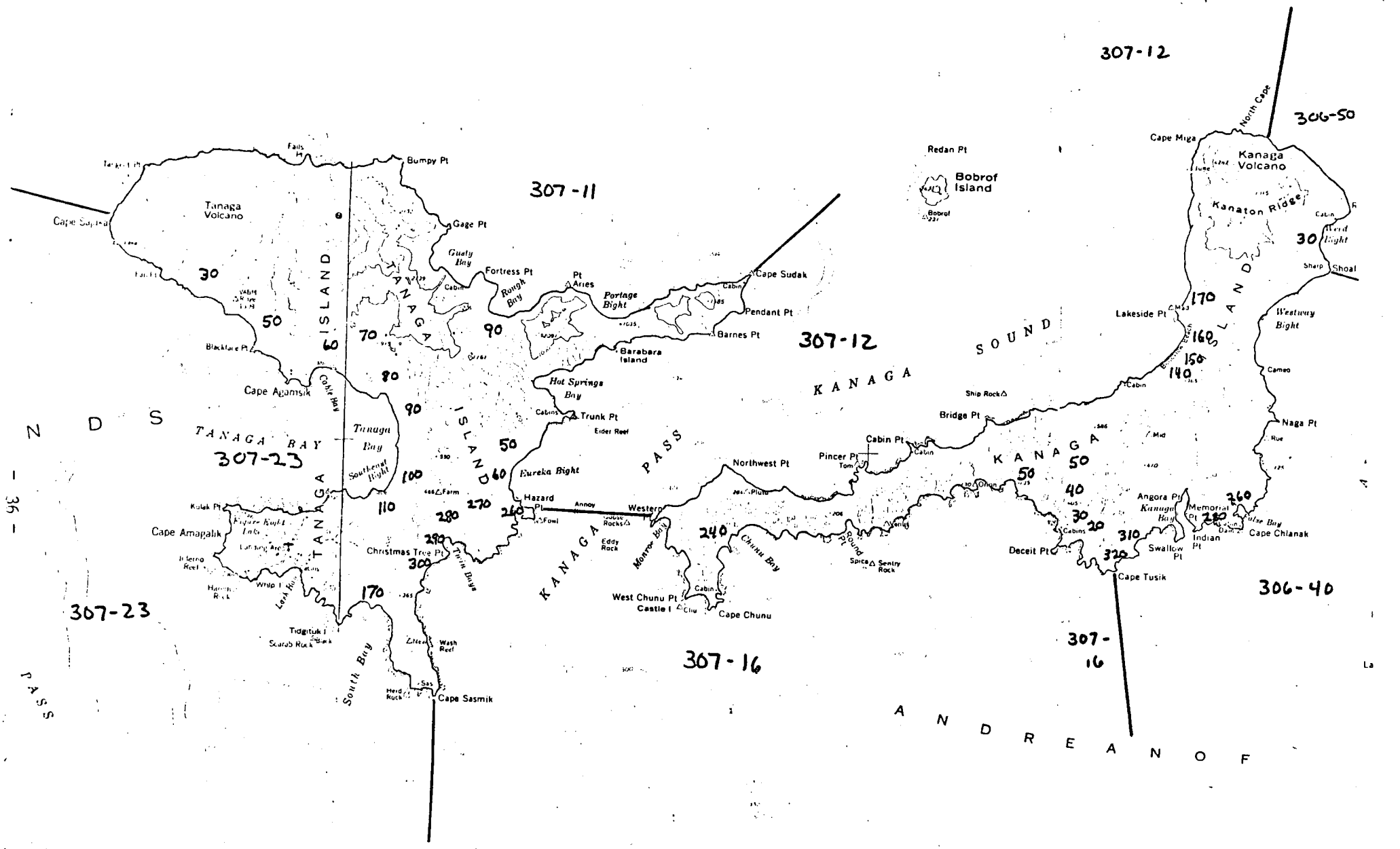
APPENDIX FIGURE 4). AMLIA ISLAND



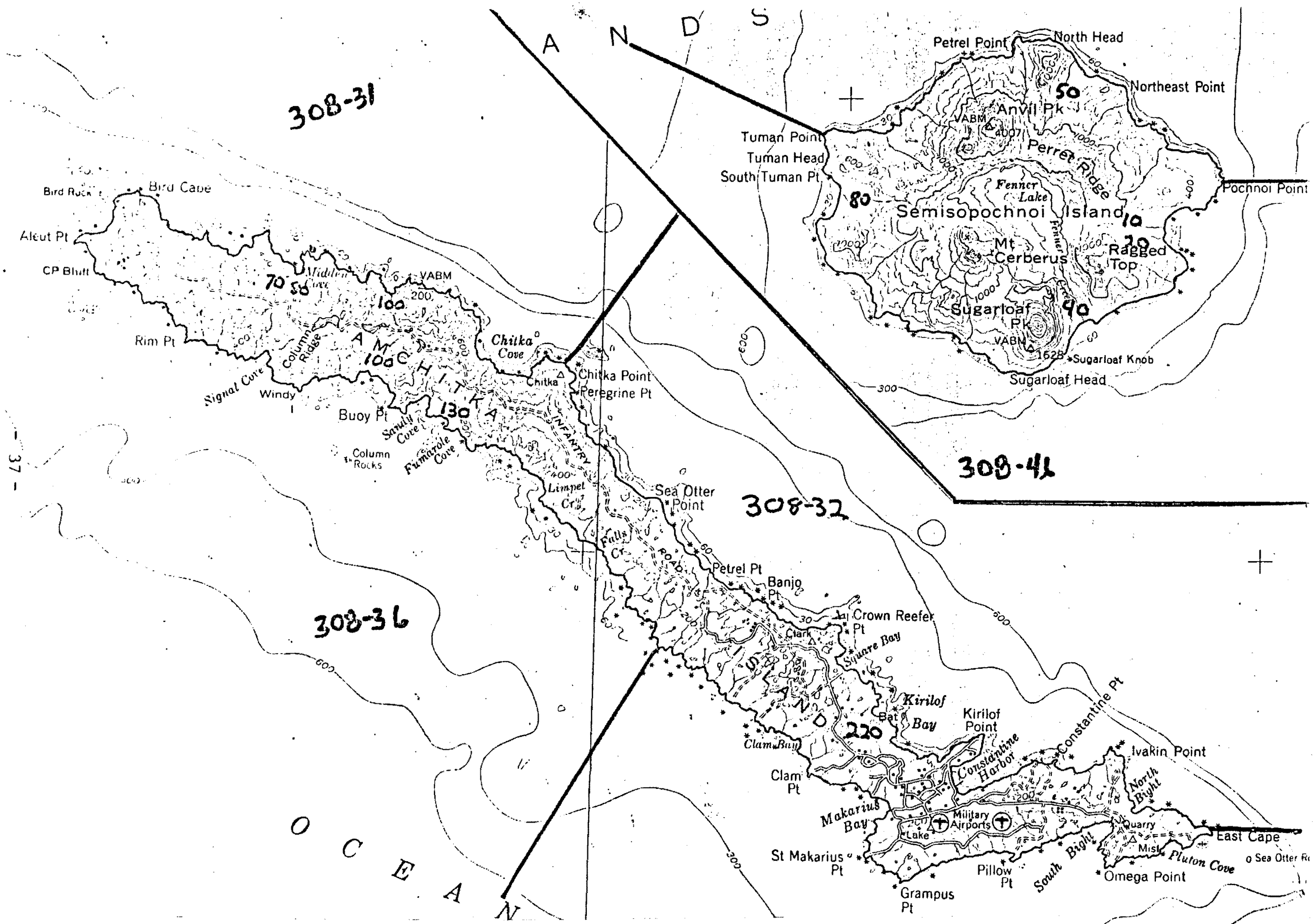
APPENDIX FIGURE 5). ATKA ISLAND



APPENDIX FIGURE 6) ADAK/GALA IS S



APPENDIX FIGURE 7). KANAGA AND TANAGA ISLANDS.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308-41
308-32
308-36
308-37
Petrel Point
North Head
Northeast Point
Anvil Pk
VABM
4007
Perret Ridge
Tuman Point
Tuman Head
South Tuman Pt
Fenner Lake
Semisopochnoi Island
Pochnoi Point
Mt Cerberus
Ragged Top
Sugarloaf Pk
1628
Sugarloaf Knob
Sugarloaf Head
50
80
10
20
90
Bird Rock
Bird Cape
Aleut Pt
CP Bluff
Rim Pt
Midden Cove
Column Ridge
A M C H I T K A
Chitka Cove
Chitka
Chitka Point
Peregrine Pt
Signal Cove
Windy
Buoy Pt
Sandy Cove
Fumarole Cove
Column Rocks
INFANTRY
Limpet Cr
Falls Cr
ROAD
Sea Otter Point
Petrel Pt
Banjo Pt
Crown Reefer Pt
Clark
Square Bay
ISLAND
Kirilof Bay
Bat
Kirilof Point
Constantine Harbor
Constantine Pt
Ivakin Point
North Bight
Clam Bay
Clam Pt
Makarius Bay
Lake
Military Airports
Quarry
Mist
East Cape
Sea Otter Rock
Pluton Cove
Omega Point
South Bight
Pillow Pt
Grampus Pt
St Makarius Pt
O C E A N
70
50
100
130
220
600
300

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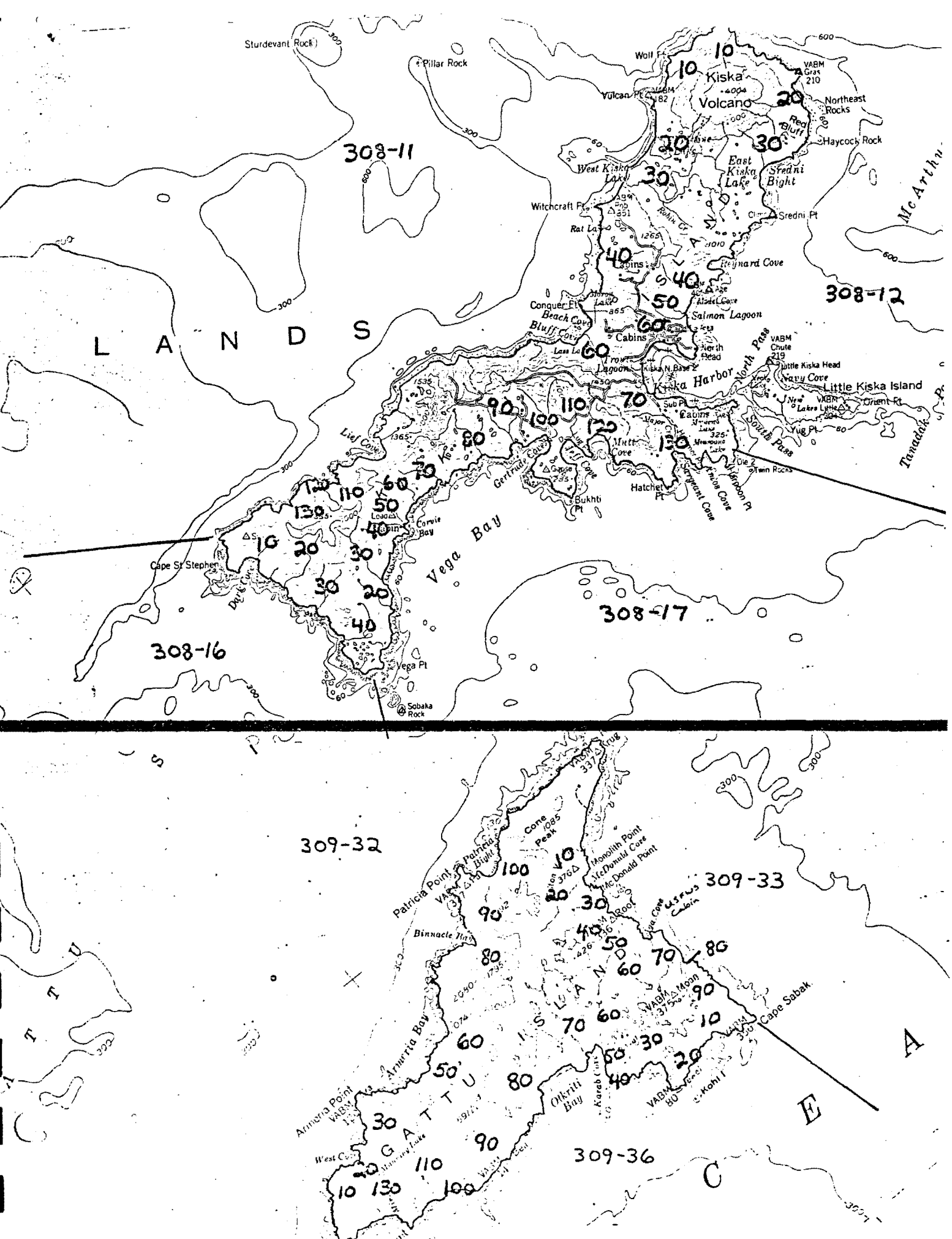
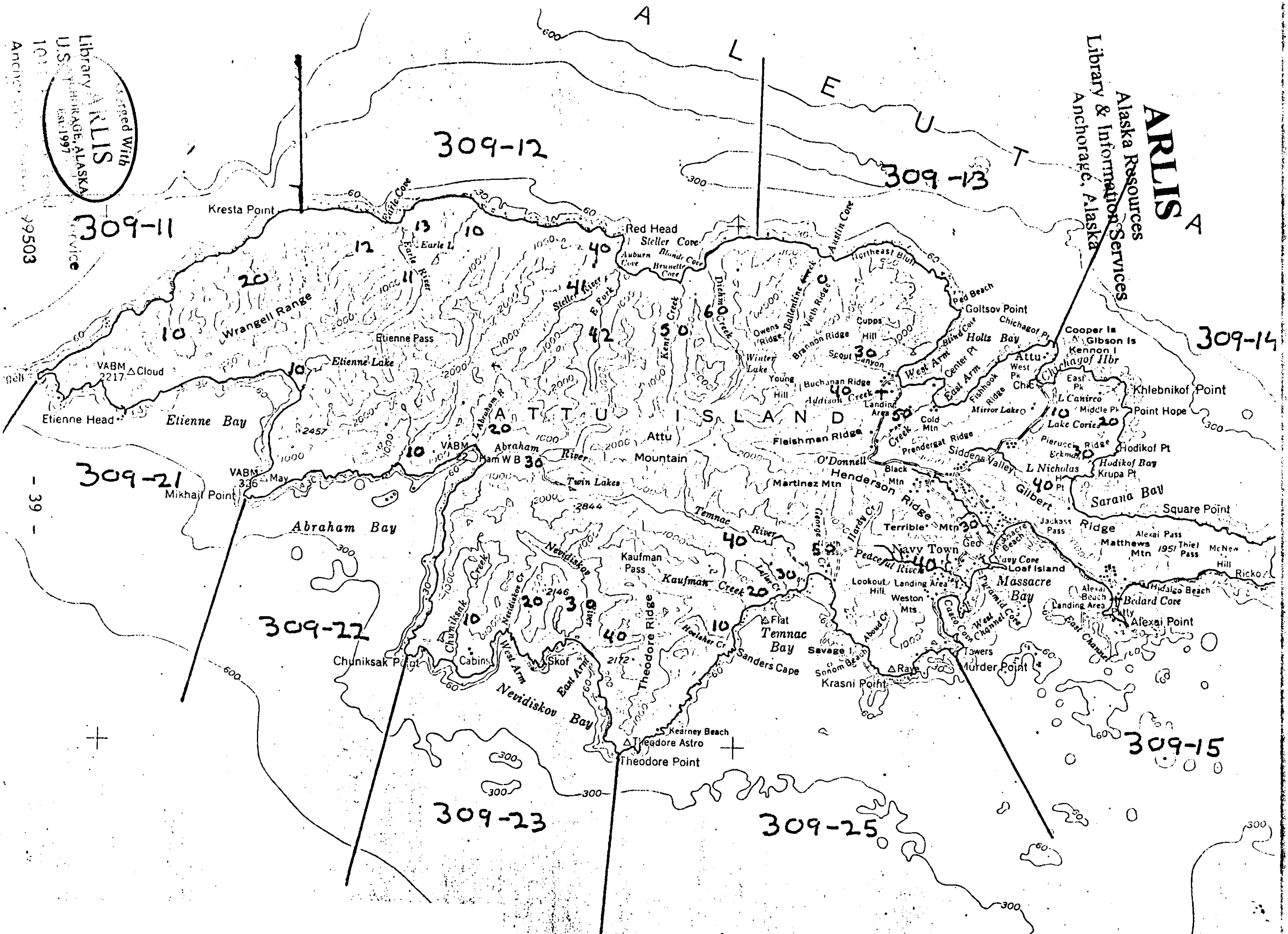


APPENDIX FIGURE 9). KISKA/AGGATU ISLANDS



APPENDIX FIGURE 10). ATTU ISLAND