

SUBSISTENCE HARVESTS OF HERRING
SPAWN-ON-KELP IN THE TOGIAK
DISTRICT OF BRISTOL BAY

by

John M. Wright and Molly B. Chythlook

Technical Paper No. 116

Alaska Department of Fish and Game
Division of Subsistence
Juneau, Alaska

March 1985

ABSTRACT

This report provides information on the subsistence use of herring spawn-on-kelp in the Togiak District of Bristol Bay. Information was gathered during the May 1983 herring season through interviews with a sample of kelping groups in the Anchor Point-Rocky Point area and the Kulukak-Metervik Bay area. In addition, the report includes data from a systematic survey of commercial fishermen from Togiak (Langdon 1983; Wolfe et al. 1984) and interviews with key respondents from Togiak, Twin Hills, Manokotak, Aleknagik, Dillingham, Clarks Point, King Cove, Sand Point, Chignik, and Petersburg. Place names in the Kukukak-Togiak area are also presented.

Residents of a number of communities between Nushagak Bay and Cape Newenham historically have harvested spawn-on-kelp for subsistence use in the Togiak district of Southwest Alaska. Herring spawn between late April and early June each year in the Togiak district. Harvests of spawn-on-kelp for subsistence use occur within a week after spawning. Spawn-on-kelp for subsistence use is usually picked by hand, though rakes and knives are occasionally used. Residents of Togiak and Twin Hills normally harvest herring spawn-on-kelp within a few hours skiff ride from their homes, in the area between Right Hand Point (about 25 miles southeast of Togiak) and Osviak (about 40 miles southwest). Residents of Manokotak, Aleknagik, Dillingham, and other Nushagak Bay communities pick it in the Kulukak and Metervik Bay area, where their families traditionally have lived and camped in the spring. Manokotak lies about 20 miles east-northeast of Kulukak Bay; Aleknagik and Dillingham are about 40 miles from Kulukak Bay.

Kelping groups at camps in the Togiak area were most commonly composed of families, with members ranging in age from 3 to 65 years old. Togiak people travelling to the herring grounds on short trips were more frequently composed of family members between their late teens and 60 years of age. In the Kulukak area, it is more common to find camping parties made up of commercial fishing crews composed mostly of male relatives and friends. Many of their families come over to the herring grounds during closures of the commercial fishery or on weekends. A few families camp in Kulukak and Metervik Bays for the duration of the herring season.

Today, freezing and salting are the most common methods of preservation. In the past, spawn-on-kelp was preserved by drying and storage in open-weave grass baskets. As in the past, people today prefer to eat spawn-on-kelp dipped in seal oil. The product of the harvest is commonly shared with relatives and friends in the harvesters' home community during feasts celebrating birthdays or holidays. Gifts of spawn-on-kelp were commonly reported, particularly to relatives and elders within the donor's home community who could not participate in the harvest themselves.

TABLES OF CONTENTS

LIST OF TABLES.....	iii
LIST OF FIGURES.....	iv
ACKNOWLEDGEMENTS.....	v
CHAPTER 1-- INTRODUCTION.....	1
PURPOSE.....	3
METHODS.....	4
CHAPTER 2 -- SETTLEMENT PATTERNS.....	7
CONTEMPORARY COMMUNITIES.....	7
HISTORIC SETTLEMENTS.....	7
SUMMARY.....	19
CHAPTER 3 -- CONTEMPORARY SOCIOECONOMIC SYSTEMS.....	20
CASH SECTOR OF THE LOCAL ECONOMY.....	20
SUBSISTENCE SECTOR OF THE LOCAL ECONOMY.....	23
CHAPTER 4 -- HISTORIC SUBSISTENCE HARVESTS OF HERRING SPAWN-ON-KELP.....	31
TIMING AND LOCATION OF HARVEST.....	32
METHODS OF HARVEST, PROCESSING, AND CONSUMPTION.....	33
CHANGES IN SUBSISTENCE HARVEST 1930s-1970s.....	32
CHAPTER 5 -- CONTEMPORARY USE OF SPAWN-ON-KELP FOR SUBSISTENCE.....	40
THE "TOGIAK PATTERN".....	40
THE "KULUKAK PATTERN".....	50
OTHER PARTICIPANTS IN THE COMMERCIAL HERRING FISHERIES.....	56
CHAPTER 6 -- SUMMARY	58
REFERENCES.....	61
APPENDICES.....	63

LIST OF TABLES

TABLE 1. POPULATION AND ETHNIC COMPOSITION COMMUNITIES IN THE TOGIAK AND NUSHAGAK BAY AREAS8

TABLE 2. YUP'IK PLACENAMES IN THE KULUKAK-TOGIAK AREA.....10

TABLE 3. HISTORICAL POPULATION OF THE TOGIAK-KULUKAK AREA.....16

TABLE 4. WILD RESOURCES KNOWN TO BE HARVESTED BY RESIDENTS OF THE TOGIAK AND NUSHAGAK BAY SUBREGIONS OF BRISTOL BAY22

TABLE 5. HARVESTS OF SELECTED FISH AND GAME FOR NON-COMMERCIAL USE IN THE TOGIAK AND NUSHAGAK BAY SUBREGIONS.....28

TABLE 6. SUBSISTENCE SALMON HARVESTS IN THE TOGIAK AND NUSHAGAK BAY SUBREGIONS.....30

TABLE 7. COMMERCIAL HARVESTS OF HERRING (SAC-ROE) IN THE TOGIAK DISTRICT OF BRISTOL BAY.....36

TABLE 8. COMMERCIAL HARVESTS OF HERRING SPAWN-ON-KELP IN THE TOGIAK DISTRICT OF BRISTOL BAY.....37

TABLE 9. COMPARISON OF CONTEMPORARY TOGIAK AND KULUKAK "PATTERNS" DURING THE HERRING SEASON IN THE TOGIAK COMMERCIAL FISHING DISTRICT.....41

LIST OF FIGURES

Figure 1. The Togiak Herring Fishing District and Surrounding Area2

Figure 2. Yup'ik Place Names in the Kulukak and Togiak Areas9

Figure 3. Seasonal Round of Subsistence Activities for Selected Resources, Togiak Subregion.....24

Figure 4. Seasonal Round of Subsistence Activities for Selected Resources, Nushagak Bay Subregion.....26

Figure 5. Commercial Herring Spawn-on-Kelp Management Areas in the Togiak District.....47

ACKNOWLEDGEMENTS

We would especially like to thank the many residents of Togiak, Manokotak, Aleknagik, Dillingham and other communities who generously shared their knowledge and hospitality. The Division of Commercial Fisheries Staff in Dillingham provided assistance throughout this project. Several people with the Division of Subsistence helped produce the report; Dan Foster drew the figures, Jim Fall and Bob Wolfe made many constructive comments, and Nancy Wickstrom typed the final draft.

CHAPTER I
INTRODUCTION

One of the largest spawning concentrations of herring in Alaska occurs in the Togiak district of Bristol Bay in the eastern Bering Sea (Fig. 1). Herring and herring spawn-on-kelp have been harvested for subsistence use by residents of this coastal area as long as people can recall. Commercial fishing for herring in the Togiak district began in 1967 and expanded dramatically after 1977 (see Chapter 4 of this report: Middleton 1983:53). Commercial herring are caught by seiners and gill-netters primarily for sale of sac-roe to Japan. Commercial spawn-on-kelp is also harvested for export to Japan, though on a much smaller scale than the sac-roe harvest. In recent years, commercial harvests of both herring and spawn-on-kelp have reached the limits of management goals set by the Alaska State Board of Fisheries and the Division of Commercial Fisheries, Alaska Department of Fish and Game (ADF&G). The increases in commercial fishing effort and harvest have prompted strict regulation and management of the commercial herring fishery.

Prior to 1983, subsistence harvests of herring and spawn-on-kelp were not regulated. In 1982-83, four staff proposals concerning subsistence harvests of herring and herring spawn-on-kelp in the Togiak district were presented to the State Board of Fisheries. These proposals were designed to: 1) define subsistence herring districts to coincide with commercial districts; 2) specify the type and amount of gear for taking subsistence herring (during closed commercial periods, gill nets not exceeding 25 fathoms in length) and subsistence spawn-on-kelp (hand picking and hand operated rakes); 3) close two bays

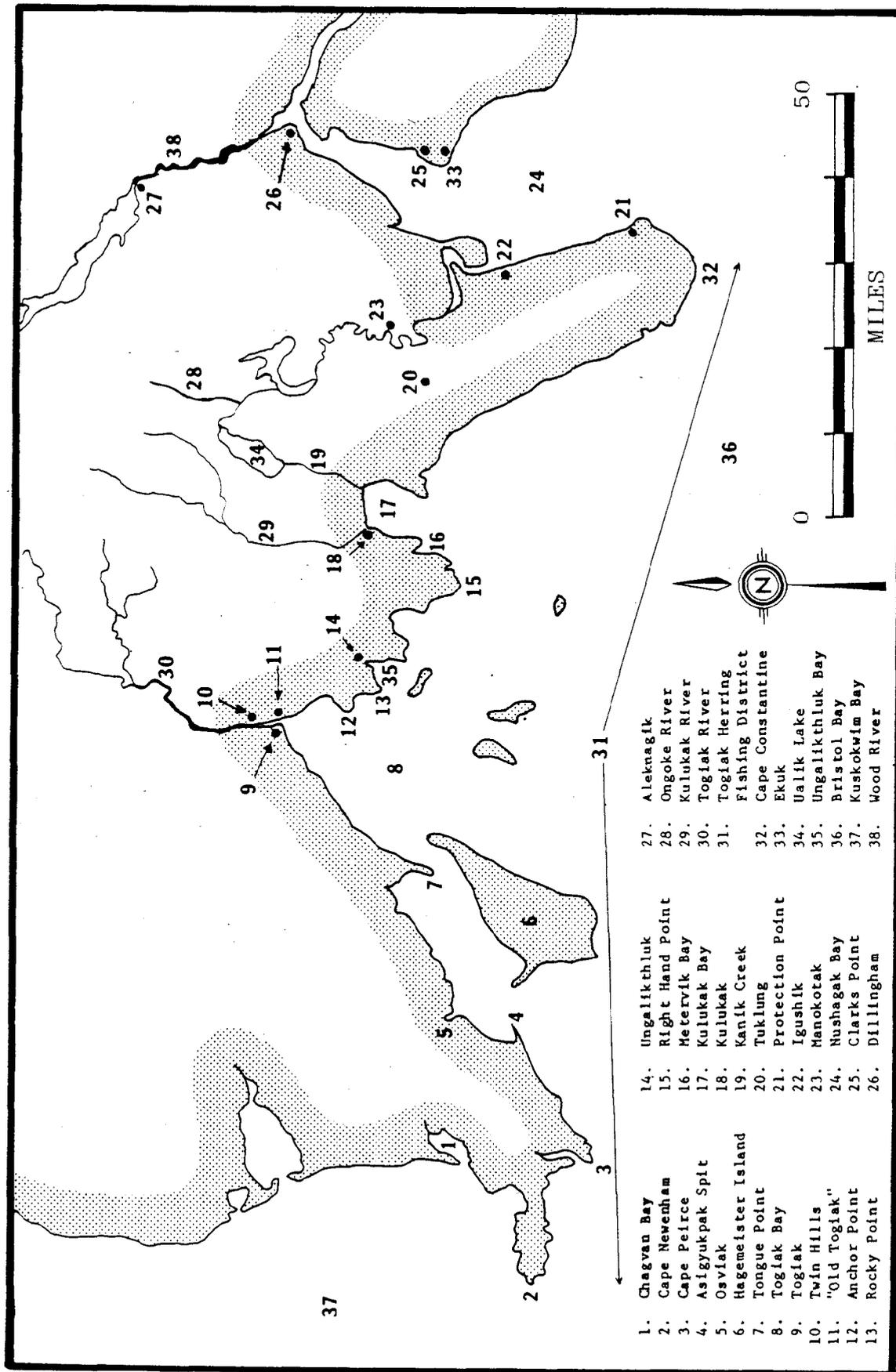


Figure 1. The Togiak herring fishing district and surrounding area.

to subsistence herring fishing that had previously been closed to commercial fishing to protect research study areas or environmentally sensitive eel grass beds; and 4) establish a permit system for subsistence harvesting of herring spawn-on-kelp.

The first three proposals were accepted by the Board, but action on the fourth was deferred until additional information on subsistence harvests of spawn-on-kelp was available. The Division of Subsistence, ADF&G in Dillingham, with the cooperation and assistance of the Division of Commercial Fisheries staff in Dillingham, undertook a study of the spawn-on-kelp subsistence harvest in 1983. Following an investigation of the subsistence harvests during the herring season and the preliminary analysis of quantities harvested, it was decided among ADF&G staff that there was insufficient justification for imposition of a permit system, primarily because of the small size of the subsistence harvest. The proposal for a subsistence permit system for the herring spawn-on-kelp harvest in the Togiak district was not resubmitted to the Board of Fisheries in 1983-84 or 1984-85, although resource managers remained concerned over the potential for illegal commercial harvests under the guise of subsistence.

PURPOSE

The purpose of this report is to document customary and traditional uses of herring spawn-on-kelp in the Togiak district of Bristol Bay, addressing in particular the criteria for defining subsistence uses identified by the Joint Boards of Fisheries and Game in their policy on subsistence (State Regulation 5 AAC 99.010).

METHODS

Information was gathered by observing and participating in activities in the Togiak district during herring season in May 1983, and through interviews with residents of the northwestern Bristol Bay area and others who took part in the herring fishery. Division of Subsistence personnel were in the herring district from 4-16 May 1983. One (MC) was in the Kulukak area for the entire period, and the other (JW) was in the Anchor Point-Nunavachak Bay area during 4-8 May and the Kulukak area from 9-13 May. One (MC) is bilingual in Yup'ik and English, and has long personal experience in the herring fishery, having camped with her family each spring in the Kulukak area since 1972.

During the herring season, a sample of participants in the commercial and subsistence fisheries was interviewed using a questionnaire (Appendix A). The questionnaire was designed to gather contemporary and historical information on the residence and composition of kelping groups, the activities conducted during herring season (with emphasis on harvest of spawn-on-kelp), and the exchange and distribution of subsistence spawn-on-kelp. Harvest areas and camping sites were mapped during interviews. Individuals were selected for interviewing with the questionnaire on an opportunistic basis from two areas within the Togiak district -- one between Anchor Point and Rocky Point in the area most commonly used by residents of Togiak and Twin Hills; and the second in Kulukak and Metervik Bays, the area used primarily by people from Manokotak and Aleknagik. Leaders of eight kelping groups were interviewed in the first area using the questionnaire (about 75 percent of the 10-12 parties camped in the area), and five were questioned in the second (about 20 percent

of the 26-27 groups camped in that area).

Information was also gathered in key respondent interviews in the communities of Togiak, Twin Hills, Manokotak, Aleknagik, Dillingham, and Clark's Point, and by telephone with commercial fishermen from other parts of the State. Within the Bristol Bay communities, older persons who had used the area for all their lives were selected for interviewing. Historical information about the use of herring and place names within the Togiak district were gathered in these interviews. Four commercial fishermen from King Cove, Sand Point, Chignik, and Petersburg (three seiners and one gillnetter) were questioned over the telephone about use of spawn-on-kelp for consumption at home by members of their fishing communities.

During the course of a socioeconomic study undertaken in Togiak in spring 1983 (Wolfe et al. 1984), a questionnaire was administered to 36 commercial salmon and herring fishermen in that community (Langdon 1983). They were questioned about commercial and subsistence activities during the 1983 herring and salmon seasons. The information from this second questionnaire (Langdon 1983) is combined wherever possible with data gathered specifically for this report.

Placename information was collected by asking (generally in Yup'ik) respondents to indicate on a 1:250,000 scale U.S.G.S. topographic map the locations they used and knew of in the Togiak-Kulukak area. During these interviews, reference notes were marked directly on the maps, and conversations were tape recorded for subsequent transcription. When specific sites were discussed, the respondents were asked to recall the traditional Yup'ik placename, the English translation of the Yup'ik name, and the significance of the site (for example, a campsite, landmark, egging location, etc.).

Background information on the Togiak and Nushagak Bay areas, including contemporary populations, the seasonal round of subsistence activities, and other aspects of the contemporary local socioeconomic system were derived from Wright, Morris, and Schroeder (1985). Information on the commercial fisheries was derived primarily from Middleton (1983) and unpublished reports from the Division of Commercial Fisheries ADF&G, Dillingham.

CHAPTER 2

SETTLEMENT PATTERNS

CONTEMPORARY COMMUNITIES

There were six year-round communities in the study area in 1983 -- Togiak, Twin Hills, Manokotak, Aleknagik, Dillingham, and Clarks Point (Fig. 1). In addition to these six, Ekuk was the year-round home of a single family. Recent estimates of population and ethnic composition of these communities are presented in Table 1. Dillingham, the regional center for Bristol Bay, had a population of 1,896 persons, 53 percent Alaskan Native. The smaller communities ranged in size from 79 to 545, and were composed predominantly of residents of Yup'ik Eskimo descent.

HISTORIC SETTLEMENTS

The following discussion focuses on the coastal area between Protection Point and Cape Newenham, roughly the area included within the Togiak district of the commercial herring fishery. Throughout this report, discussions of historic information pertain to the early twentieth century, the earliest years recalled by elder residents of the Togiak and Nushagak Bay areas interviewed for this report. Underlined place names are the local Yup'ik names (Fig. 2, Table 2), spelled following the orthography in Jacobsen (1984). Place names in quotations are English names not found on U.S. Geological Survey maps. Place names lacking both underlining and quotations are from the U.S. Geological Survey maps.

Several historic settlements existed from Cingigak (Protection Point), on lower Nushagak Bay, west to Asviryaq (Osviak). Historic population levels in this region according to U.S. Census data are presented in Table 3. Census

TABLE 1. POPULATION AND ETHNIC COMPOSITION OF COMMUNITIES IN THE TOGIAK AND NUSHAGAK BAY AREAS

COMMUNITY	POPULATION	PERCENT ALASKA NATIVE ^a
Togiak	545 ^b	94
Twin Hills	70 ^a	97
Manokotak	299 ^b	93
Aleknagik	154 ^a	90
Dillingham	1,896 ^b	58
Clarks Point	79 ^a	89
Ekuk	7 ^a	na

^a 1980 U.S. Census data, from Nebesky et al. 1983

^b 1983 local community censuses conducted for revenue sharing purposes, Alaska Department of Community and Regional Affairs, Dillingham, pers. Comm., 1984.

na = not available

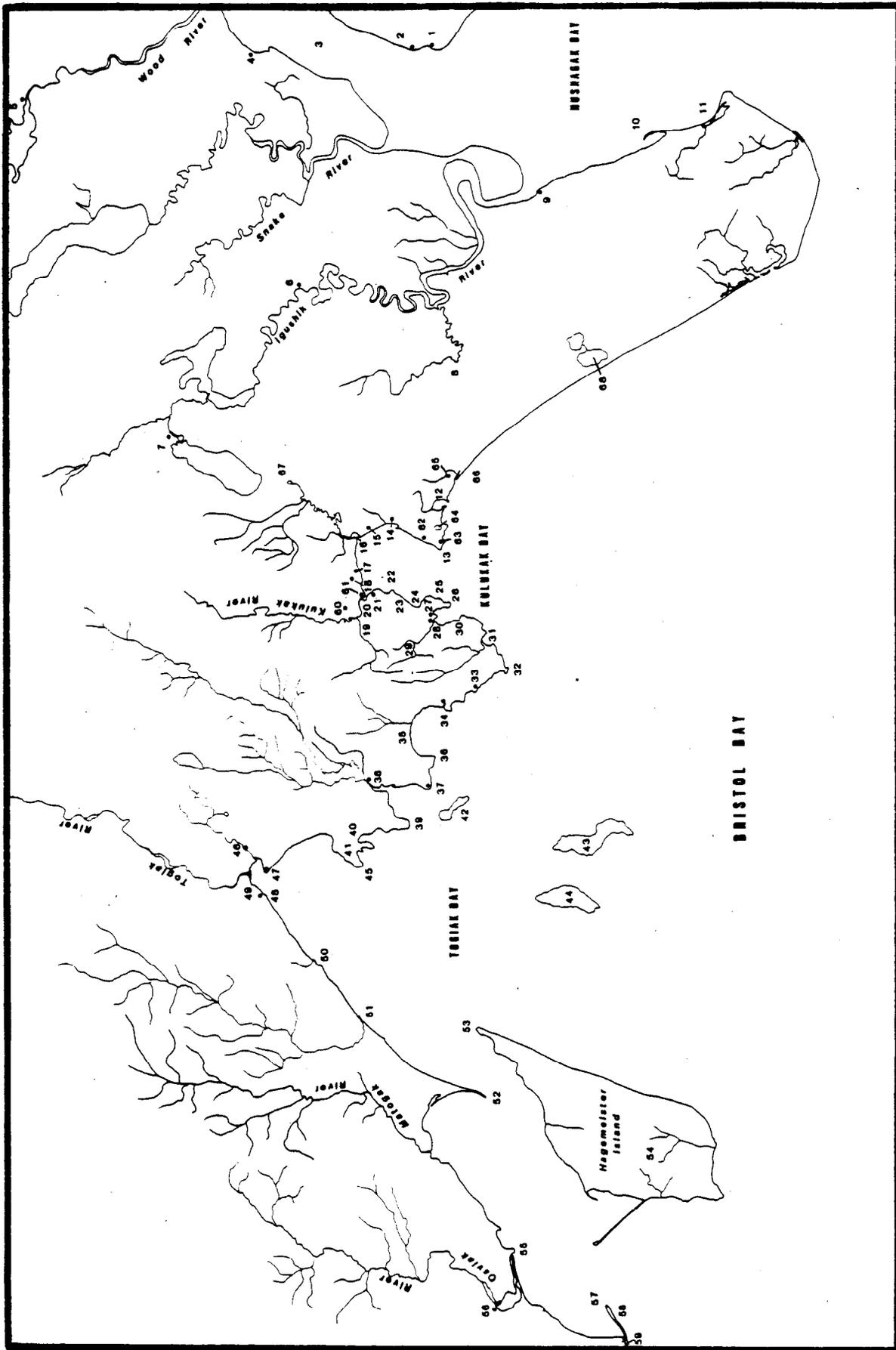


Fig. 2. Yup'ik place names in the Kulukak and Togiak areas.

TABLE 2. YUP'IK PLACE NAMES IN THE KULJKAK-TOGIAK AREA
(See Fig. 2)

Code on Map	Yup'ik Name	Referent	English Meaning of Yup'ik Name	Comments
1	Iquk	Ekuk	"The end"	Old village site, contemporary summer camp and salmon cannery
2	Saguyaq	Clarks Point	Possibly related to "scatter"	Former cannery on Nushagak River, Village site and old salmon cannery.
3	Iilgayaq	Nushagak River	Nushagak Bay	Nushagak Area Name
4	Curyung	Dillingham	Possibly related to "murky"	Village
5	Alaqaqaiq	Aleknagik	Possibly related to the word "error" derived from Yup'ik name from Wood River	Village
6.	Manuquutaq	Manokotak	Possibly a "place of the front"	Village
7.	Anguuq	Ongoke River	"To urinate accidentally"	Old village site
8.	Tuqlung	Tuklung River	"Tunnel entrance"	Old village site
9.	Iyuussiiq	Igushik	.	Summer village site and set-net camp
10.	Kangiilik	Nichols Spit	"Source of water"	Subsistence hunting area
11.	Cingigaaq	Protection Point	"One that has been sharpened"	Village site

Code on Map	Yup'ik	Referent	English Meaning of Yup'ik Name	Comments
12.	Tevatevaam Qamanera	Tvativak Bay	"Place lacking water current or to be calm of water/wind"	Bay
13.	Quluut	Kulukak Point	Point of Qulukaq	Place to gather kelp/herring
14.	Ekviraat	Many small cliffs	"Small cliff", bluff-high steep bank	Land mark
15.	Ungarpak	Mountain south of Ekviratt	"Large Beard"	Land mark
16.	Qaneq	Kanik River	"Mouth"	Mouth of Kanik River
17.	KiturciraInguq	Between Maniaq and Qaneq	"Can't be passed"	Old village site
18.	Maniaq	Above KiturciaInguq	Possible related to "small smooth area", place	Land mark
19.	Pamatirgun	First creek south of Nunakreraq	"Place to go behind"	Creek that forks off Kukukak River
20	Qulukaq	Kulukak	"Aged smell, something rotten"	Old village site
21	Nunakreraq	Newer second Qulukaq village	"Small land or village"	Old village site
22	Qikertaar	Seagull Island	"Small Island"	Egg gathering island
23	Cakivik	between Qikertaar Island and Macevik	"Place to chop wood"	Wood gathering place
24	Macevik	between Qikertaar Island and Metervik Head	Possibly place to "warm up"	Spring camp site

Code on Map	Yup'ik Name	Referent	English Meaning of Yup'ik Name	Comments
25	Metervim Qamiqurra	Metervik Head	"Head of eider"	Land mark
26	Metervim Nuura	Metervik Point	"Point of Metervik"	Land mark
27	Anguqvanertuli	Southeast of Cukaraq	"Place where wind blows hard"	Land mark
28	Cukaraq	Gust T's camp	Possibly meaning "fast"	Spring camp site
29	Cukar	Valley above Gust T's camp	Root word for "fast"	Place to corral reindeer
30	Nunacuarell	Fish and Game camp	"Little old village"	Spring camp site
31	Takliar	Eagle Bay	"Something small and long"	Spring Camp site
32	Nunaraq	Right hand Point	"Piece of land"	Land mark
33	Anngaqtar	Rock Woman	Yup'ik name of a legendary woman	Land mark
34	Nallupiaki	Small bay between Anngaqtar and Nunavachak Lake	Really don't know it	Protection bay for boats
35	Nunvacuam Nunva	Nunavachak Lake	"Small lake"	Village site
36	Napangiak	Between Nunavachak Lake and Kaviaret	"Standing upright"	Land mark
37	Kaviaret	West of Napangiak	"Many fox"	Land mark

Code on Map	Yup'ik Name	Referent	English Meaning of Yup'ik Name	Comments
38	Ungalaqlik	Ungalikthluk	"Southern most part"	Old village site
39	Ungalaqlim Nuura	Rocky Point	"Point of Ungalikthluk"	Land mark
40	Kangeracungarpak	North of Rocky Point	"Large bay"	Land mark
41	Kangeracungayaraq	Next two bays west of Kangeracungurpuk	"Small bay"	Land mark
42	Qilkeq	Summit Island	"Named after person in legend concerning the Island"	Land mark
43	Nunalukaq	Crooked Island	Possibly relating to "unwanted land"	Land mark
44	Ingriqvak	High Island	"large old island"	Land mark
45	Qikertaq	Southwest of Togiak	"island"	Walrus haul out island
46	Ingricuar	Twin Hills	"Small mountain"	Village
47	Tuyuryaq	Old Togiak Village	Possibly a place of "sending"	Old village site, salmon cannery and summer camp
48	Tuyuryaq	New Togiak Village	Possibly a place of "sending"	Village
49	Nasaurluq	River behind Togiak Village	"Young girl"	River

Code on Map	Yup'ik	Referent	English Meaning of Yup'ik Name	Comments
50	Quik	Southwest from Togiak village	"River"	River
51	Assigyuyak	Tougue Point	"Big spit"	Land mark
52	Ungluyaraq	Rocky Point	"Small nest"	Land mark
53	Qikertarpak	Hagemeister Island	"Large island"	Land mark
54	Eqisnicuar	Estus Point	.	Land mark
55	Asviryaq	Osviak	Possibly related to "stabilize"	Old village site
56	Isayan			Land mark
57	Assigyupak	Assigyupak Spit		Land mark
58	Anarniq	West of Assigyupak Spit	"Smell of bird droppings"	Bird egg gathering site
59	Senquq	Up creek from Cingiraak	"Old and rough edge"	Land mark
60	Cingiraak	Old village west of Kiturciralinguq	"Small Point"	Village site
61	Penurpiit	Mountain south of Ungarpak	"Large bluff or cliff"	Land mark
62	Kelistartalik	Place east of Quluut"	"Place that has a cross"	Land mark
63	Napanguyaq/ Cuqaarankermek	Mountain east of Kelistarlik	Possibly related to "tree"	Land mark

Code on Map	Yup'ik	Referent	English Meaning of Yup'ik Name	Comments
64	Uqvikkerlik	Up the creek from Quarcitulik	"Place with wild rhubarb"	Land mark
65	Quarcitulik	Mouth of creek below Uqvikkerlik	"Place with wild rubbarb"	Mouth of river
66	Nunvarngak	Two small lakes from Qaneq"	"Two small lakes"	Two small lakes
67	Anglurvik	Lake with many bird eggs	"Place to dive"	Egg gathering place

TABLE 3. HISTORICAL POPULATION OF THE TOGIAK-KULUKAK AREA

Community	1880	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980
Igushik											
Igushek	74										
Igushik Village						28	16				
Tuklung											
Tokelung Village						39					
Tuklung Village								30			
Kukukak											
Kulluk	65										
Kulukak Village					83	28	55				
Manokotak									149	214	294
Manokotak Village								120			
Ungalikthluk											
Ooalikh	68										
Togiak		14							220	373	470
Togiagamute	276										
Togiak Station	24										
Togiagamiut		94									
Togiak Village					91	71	10	108			
Togiak Bay							46				
Togiak River communities											
Ikaliukha	192										
Ikalinkamiut		60									
Tunniakhpuk	137										
Kassianmute	615										
Kassiachamiut		50									
Kashiagamut Village							33				
Nulatok	211										
Nulohtagmiut		31									
Kissaikh	181										
Annugannok	214										
Twin Hills										67	70
Osviak											
Aziagvigamute	132										
Aziavigamiut		90									
Uzavigiakamut Village							63				
Aleknagik										128	154
Aleknagik Village							78	153			
Aleknagik Lake									181		
Aleknagik Mission									50		

Source: U.S. Census data (1880-1970 from Rollins 1978, Togiak-Kulukak communities not included in 1900 and 1910 censuses; 1980 data from Nebesky et al. 1983)

data from 1890 through 1950 underestimate the actual historic population levels.

Within the memory of informants, Protection Point was a small, sporadically used settlement which seldom had more than 3-4 families residing there for more than a few years at a time. People living at Protection Point came from and returned to neighboring, more stable communities such as Kulukak (Qulukaq) and Igushik (Iyuussiiq). Protection Point was last used as a winter settlement in the 1940s. Residents of Protection Point traveled to rocky, coastal sites in the Kulukak and Metervik bay area to harvest herring spawn-on-kelp. None was available in the immediate vicinity of Protection Point. The area continues to be used in the 1980s by residents of Nushagak Bay as a campsite, primarily during spring for harvesting marine mammals and waterfowl. Some herring are gillnetted there for subsistence use by residents of Clarks Point.

Kulukak (Qulukaq) was a permanent winter community located on the southwest shore of the Kulukak River where it enters Kulukak Bay. Petroff (1881) counted 65 or 75 people there (he spelled the name "Kulluk") in 1880. The 1920 U.S. Census enumerated 83 residents; it is uncertain whether this total was counted just prior to or during the 1919-20 influenza epidemic which ravaged Southwest Alaska (VanStone 1967:103). Later, probably in the 1920s or early 30s, many families left the community following the death of a school teacher, with most people moving to Ongoke (Anguuq), upstream from Ualik Lake. In the past, people often moved away from village sites where unusual deaths occurred. In more recent times (the 1940s and 50s) movements have most frequently been prompted by regulations requiring children to attend school and governments agencies' decisions to construct only a few schools in select locations -- forcing relocation of many families to communities with schools. A few families remained in Kulukak, but moved to a new location a short

distance up the Kulukak River when that site, Nunakreraq, was selected by a new family settling in the area. Several additional families subsequently moved to Nunakreraq from Anguuq. Nunakreraq was abandoned in the early 1940s. Many families moved to the Igushik River area, to Igushik (Iyuussiiq) and Tuklung (Tuglung). Eventually, members of these communities established Manokotak (Manuquutaq) in the late 1940s. Others moved to Aleknagik (Alaagna-gig) where people from the Togiak and Kulukak areas were resettling a village site at the outlet of Lake Aleknagik that had been abandoned following the 1919-20 influenza epidemic.

West from Kulukak, Petroff (1881) noted the village of "Ooallikh" with a population of 68. The exact location of this site is uncertain, but it was probably Ungalikthluk (Ungalaglik), at the head of Ungalikthluk Bay. An elderly former-resident of Togiak recalled that Ungalaglik was a separate community from Togiak. Few families lived there year-round.

At the head of Togiak Bay, on the east side of the entrance to the Togiak River, was "Old Togiak" (Tuyuryuq). Petroff (1881) listed a population of 276 at "Togiagamute" and an additional 1,550 people in 6 communities up the Togiak River. Oswalt (1967) considered the upriver numbers "highly suspect" and felt a population half that large would be a better estimate in light of other censuses, and population densities in adjacent areas. The contemporary community, Togiak (Tuyuryaq), is on the west side of the river mouth. It was settled by residents of "Old Togiak" in the 1930s, drawing people from neighboring coastal communities and from up the Togiak River because of its church and school. People also moved to Togiak from more distant areas, reportedly because of the availability of work at the salmon cannery constructed at "Old Togiak" in the 1950s. Approximately one-fourth of 189 household heads in Togiak (from a total count of 108 households) interviewed in 1983 were born

in the Kuskokwim Bay or River area, and an additional fifth were born in Bristol Bay or other areas outside of the immediate Togiak area (Wolfe et al. 1984:96).

Twin Hills (Ingricuar) is a recent offshoot of Togiak. Following the flooding of Togiak in 1964, a small group of families selected a higher, more protected site to live a couple of miles up the eastern channel of the Togiak River. Most of these families had originally come from the southern Kuskokwim Bay area.

Southwest of Togiak was the community of Osviak (Asviryaq), located on the shore of the lagoon at the mouth of the Osviak River. Petroff (1881) counted 130 "Aziagiamute" in fall 1880. A past resident of "Old Togiak" recalled the exciting dancing and feasting that occurred when Osviak people invited neighboring villagers to their winter dances. Osviak was abandoned in the 1940s or 1950s as people moved into Togiak where schooling was available. Thirty of 189 household heads in Togiak interviewed in 1983 said they came from Osviak (Wolfe et al. 1984:96).

SUMMARY

In 1983, the people who once lived in a number of communities within the Togiak district were concentrated primarily in the contemporary communities of Togiak, Manokotak, and Aleknagik. This consolidation occurred for the most part in the 1940s and 1950s. The other present-day community within the Togiak district, Twin Hills, was composed primarily of people from the Kuskokwim Bay area who originally moved to Togiak in the 1940-60s. Several families from the Kulukak and Togiak areas moved to Aleknagik, beginning in the 1930s when Aleknagik was resettled. A small number of people from Kulukak and Togiak areas settled in the nearby regional center, Dillingham.

CHAPTER 3

CONTEMPORARY SOCIOECONOMIC SYSTEMS

CASH SECTOR OF THE LOCAL ECONOMY

Togiak, Manokotak, Twin Hills, and Aleknagik share a common reliance upon a mixed cash--subsistence economy. Commercial salmon fishing is the dominant cash--generating activity in these smaller communities. Dillingham, the regional center of Bristol Bay, has a large number of residents employed by government and service sectors in addition to commercial fishing.

In 1982, there were 133 commercial salmon fishing permits (65 percent for drift nets and 35 percent for set nets) held by Togiak residents. All but one permit was for the Bristol Bay fishery. Commercial fishing accounted for 78 percent of the earned income reported by Togiak residents that year. The commercial salmon fishery in the Togiak district differs from the Nushagak Bay fishery because local residents comprise the majority of fishermen in the Togiak district, whereas local fishermen are a minority in the Nushagak district. Employment by government provided 14 percent of earned income in Togiak, while the local village corporation accounted for 2 percent and the local canneries for 1.5 percent. Approximately 34 full-time and 21 part-time regularly scheduled jobs were available in Togiak in 1982, with additional temporary, seasonal positions open at various times of the year (Wolfe et al. 1984).

The cash sectors of the economies of Manokotak, Twin Hills, and Aleknagik appear to be similar to Togiak's according to information of the Alaska Department of Community and Regional Affairs (1982). In the early 1980s, there were 98 commercial salmon permits in Manokotak and 41 wage-paying

positions, predominantly government funded. Thirteen commercial salmon limited entry permits were held by residents of Twin Hills, and nine regularly scheduled jobs were available. In Aleknagik, 57 commercial salmon permits were owned by residents, while there were 17 wage-paying jobs in the community (Alaska Department of Community and Regional Affairs 1982).

Approximately 136 drift-net and 93 set-net permits for the Bristol Bay salmon fishery were held by residents of Dillingham in the early 1980s (Alaska Department of Community and Regional Affairs 1982). One cannery and several shore-based processing plants were located in the city.

In 1980, Alaska Consultants, Inc., estimated that the equivalent of 828 jobs were held by residents of Dillingham (1980 population of 1,563 in 467 households; U.S. census data in Nebesky et al. 1983). Forty percent of these jobs were related to commercial fishing. Government provided 180 jobs, manufacturing 155, the service industry 144, trade 101, and transportation, communications, and public utilities 96.

SUBSISTENCE SECTOR OF THE LOCAL ECONOMY

Information on the subsistence activities in the Togiak and Nushagak Bay areas was summarized recently in Wright, Morris, and Schroeder (1985). In that report, Togiak, Twin Hills, and Manokotak were recognized as the Togiak "subregion" of Bristol Bay, while Aleknagik, Clarks Point, Dillingham, and Ekuk comprised the Nushagak Bay subregion. Table 4 lists the resources known to be harvested by residents of the two subregions.

A generalized annual cycle of subsistence activities for the Togiak subregion is portrayed in Figure 3. The timing of harvest activities in the

TABLE 4. WILD RESOURCES KNOWN TO BE HARVESTED BY RESIDENTS OF THE TOGIK AND NUSHAGAK BAY SUBREGIONS OF BRISTOL BAY

Resource	Togiak Subregion	Nushagak Bay Subregion
King salmon	x	x
Red salmon	x	x
Silver salmon	x	x
Chum salmon	x	x
Pink salmon	x	x
Dolly Varden	x	x
Whitefish	x	x
Lake trout	x	x
Rainbow/steelhead	x	x
Grayling	x	x
Pike	x	x
Blackfish	x	x
Smelt	x	x
Halibut, sole, flounder	x	x
Herring	x	x
Capelin	x	
Cod	x	
Harbor/spotted seal	x	x
Ringed seal	x	x
Bearded seal	x	x
Sea lion	x	
Walrus	x	x
Belukha	x	x
Other whales	x	
Moose	x	x
Caribou	x	x
Brown bear	x	x
Black bear	x	x
Porcupine	x	x
Arctic hare	x	x
Snowshoe hare	x	x
Marmot	x	
Parky squirrel	x	x

continued on next page

TABLE 4 (continued). WILD RESOURCES KNOWN TO BE HARVESTED BY RESIDENTS OF THE TOGIAK AND NUSHAGAK BAY SUBREGIONS OF BRISTOL BAY

Resource	Togiak Subregion	Nushagak Bay Subregion
Beaver	X	X
Red fox	X	X
Arctic fox	X	
Wolf	X	X
River otter	X	X
Wolverine	X	X
Mink	X	X
Marten		X
Weasel	X	X
Lynx	X	X
Muskrat	X	X
Ducks	X	X
Geese	X	X
Swan	X	X
Crane	X	X
Ptarmigan	X	X
Grouse	X	X
Bird eggs	X	X
Clams, mussels	X	X
Crabs	X	
Herring spawn-on-kelp	X	X
Salmonberries	X	X
Blueberries	X	X
Blackberries	X	X
Low-bush cranberries	X	
High-bush cranberries	X	X
Huckleberries	X	X
Vegetables	X	X
Herbs	X	X
Basketgrass	X	X
Firewood	X	X

Source: Wright, Morris, and Schroeder (1985)

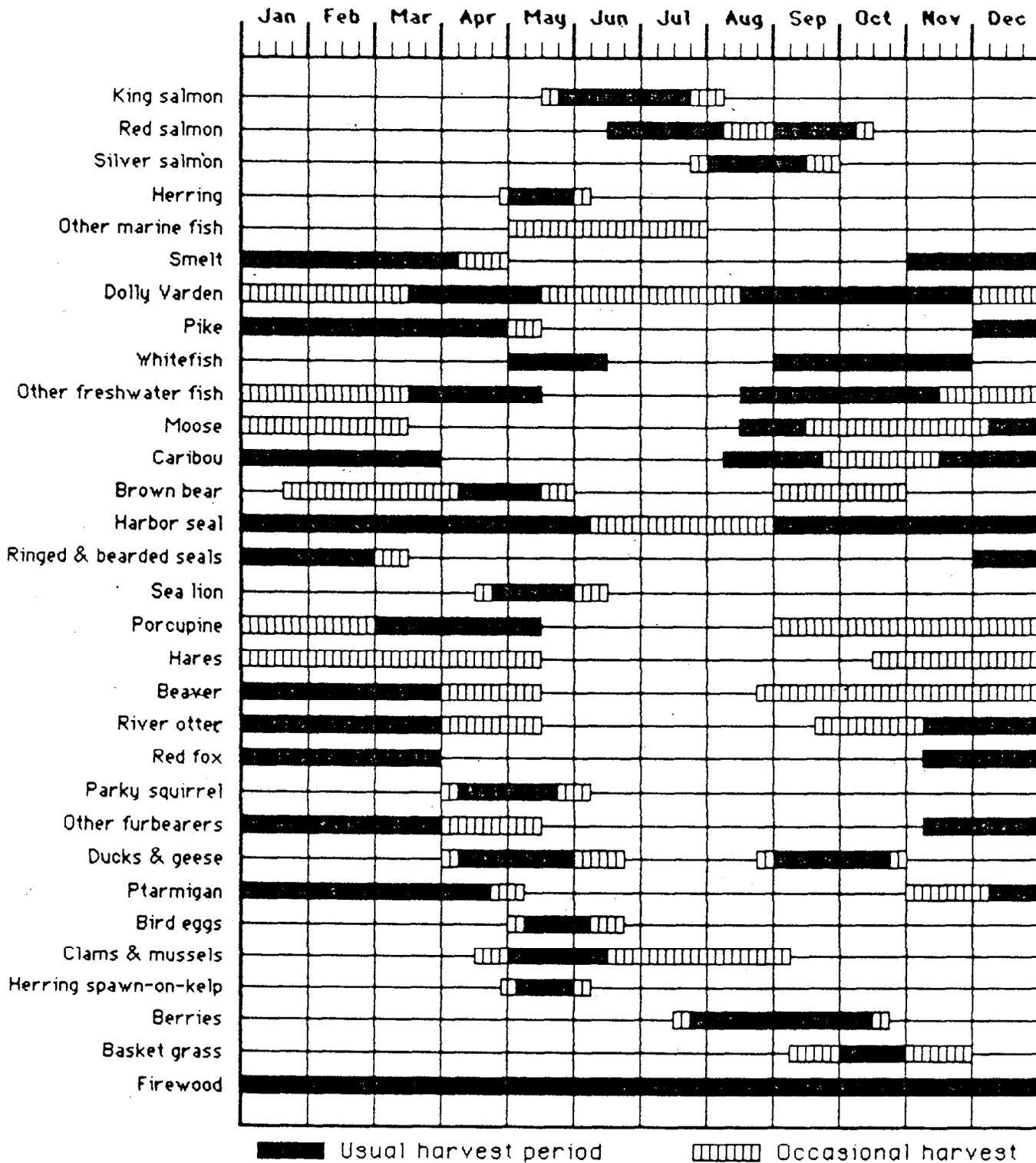


Fig. 3. Seasonal Round of subsistence activities for selected resources, Togiak subregion

Nushagak Bay subregion is essentially the same (Fig. 4), though there is more emphasis on terrestrial rather than marine resources by residents of Nushagak Bay (cf. Wright, Morris, and Schroeder 1985).

Spring harvests commence with the arrival of eiders and emperor geese on their way north to nesting grounds, and the emergence of parky squirrels and brown bears from their dens. Hunters travel to coastal areas to hunt marine mammals and waterfowl. A short time later, ususally around the first week of May, herring enter nearshore waters to spawn. They are netted and preserved by drying and salting. Herring spawn-on-kelp is picked and eaten fresh or preserved by salting, freezing, or drying. During the time of the herring run, clams are dug and some marine mammal and waterfowl hunting occurs. Many residents of the area also participate in the commercial spawn-on-kelp and herring sac-roe fisheries (see Chapter 5). Later in May and in June, eggs of gulls and seabirds are collected.

Commercial and subsistence salmon fishing are the primary activities during the months of June and July. Kings are the first salmon to run up local rivers, followed by reds, chums, pinks, and silvers. Incidental catches of halibut, and occasionally flounder and sole, are saved from commercial salmon catches for consumption at home. Dolly Varden (char) are taken throughout the year, but are caught in largest quantities in spring and fall. Smelt, whitefish, and pike are taken by jigging or in nets from late fall through spring.

Berry picking starts with salmonberries (cloudberries) in mid to late July and continues through fall as blueberries, huckleberries, blackberries (crowberries), and lowbush cranberries ripen. In August and September, moose and caribou hunting is a major activity with many hunters travelling to the Wood River Lakes and the Nushagak-Mulchatna areas. Spotted (harbor) seals,

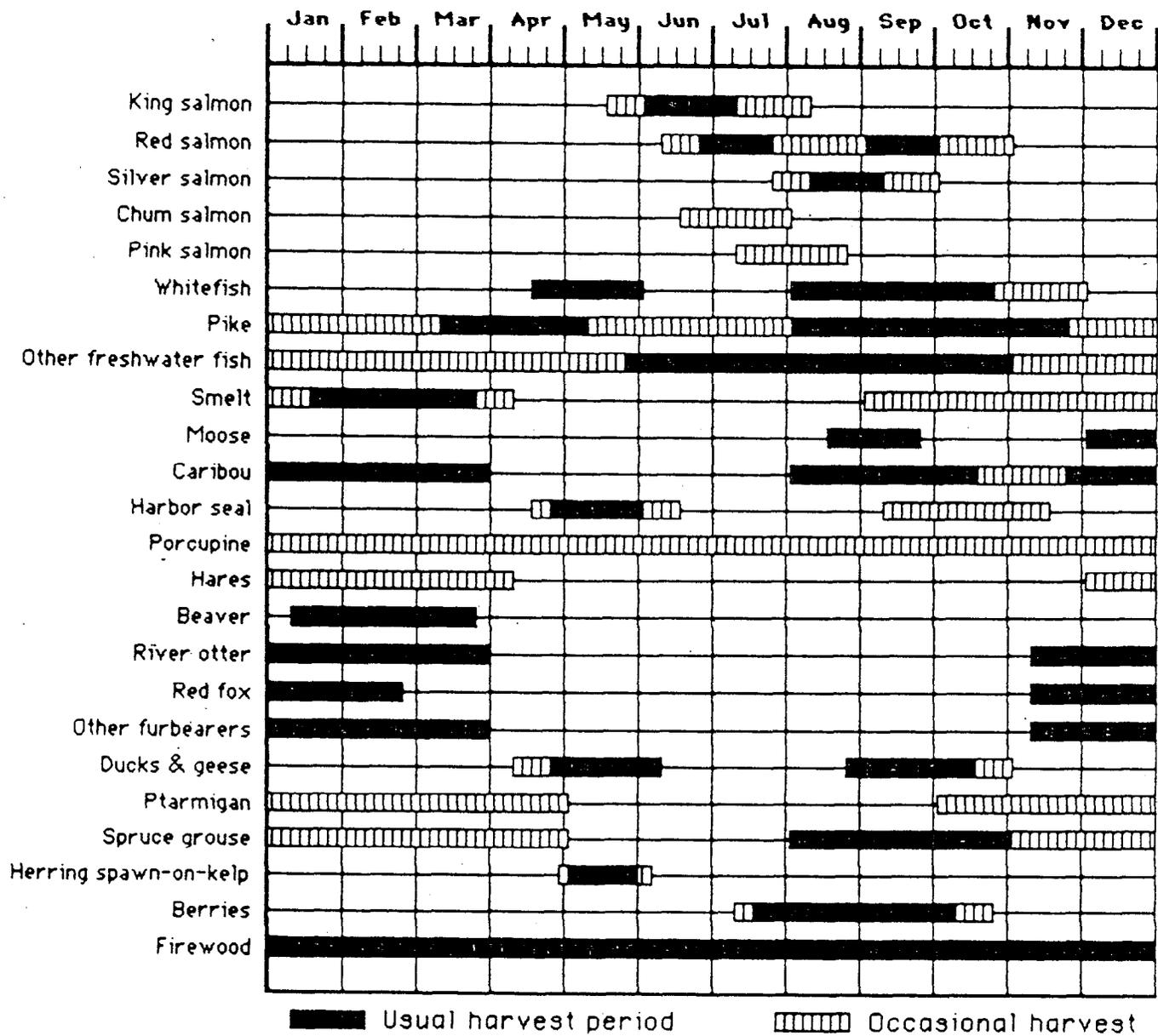


Fig. 4. Seasonal round of subsistence activities for selected resources, Nushagak Bay Subregion

waterfowl, and small mammals are taken within the Togiak area in the fall. Later in fall and in winter, hunters travel to neighboring subregions by airplane or snowmachine to hunt caribou.

During winter, beaver, red fox, and river otter are the primary species sought by trappers. Beaver are an important source of food as well as fur and may be taken at other times of the year. When ice covers Togiak Bay in late winter, bearded and ringed seals are available to hunters, in addition to spotted seals, walrus, and sea lions which are present year-round. As the sea ice moves out of the bay, the spring migration of eiders and emperors begins and the annual cycle starts anew.

No comprehensive data on quantities of resources harvested for subsistence use in the Togiak area are available. Among five case examples of Togiak households (selected across a gradient of cash incomes derived from a variety of sources) subsistence production ranged from 458 to 1,110 pounds dressed weight per household member in 1982 (Wolfe et al. 1984). Earlier studies in 1973 in Manakotak and Aleknagik (Gasbarro and Utermohle 1974), and in 1975 in Aleknagik (Nicholson 1976) found average per capita harvests in the communities ranging from 202 to 396 pounds dressed weight (Table 5). Fish, particularly salmon, and moose accounted for the bulk of the reported harvest in Manakotak and Aleknagik. The importance of Dolly Varden and marine mammals is not evident in the data presented in Table 5. In the early 1970s, the Division of Commercial Fisheries of the Alaska Department of Fish and Game conservatively estimated that 100,000 Dolly Varden were taken each year by residents of Togiak and Twin Hills (office files, Division of Commercial Fisheries, ADF&G, Dillingham). Using the combined populations of Togiak and Twin Hills in 1970 (450 persons) that converts to just more than 300 pounds of Dolly Varden per person. Subsistence salmon harvests in the region have been monitored since the 1960s

TABLE 5. HARVESTS OF SELECTED FISH AND GAME FOR NON-COMMERCIAL USE IN THE TOGIAK AND NUSHAGAK BAY SUBREGIONS

Resource	Household Harvest ^a		
	1973 ^b		1975 ^c
	Manokotak	Aleknagik	Aleknagik
Salmon	790	450	923
Pike	264	42	128
Whitefish	41	27	47
Grayling	19	4	nr ^d
Dolly Varden	38	19	nr
Smelt	36	1	nr
Herring	16	8	nr
other fish species	42	33	49
Moose	483	232	718
Caribou	158	57	80
Seal	41	20	nr
Walrus	21	0	nr
Belukha	147	0	nr
Beaver	78	78	158
Porcupine	4	5	13
other mammal species	22	5	nr
Geese and ducks	82	17	31
Ptarmigan and grouse	57	12	57
TOTAL HARVEST PER HOUSEHOLD	2339	1010	2204
TOTAL HARVEST PER CAPITA	396	202	329

^a Pounds dressed weight per household. Conversions from number of animals to pounds made using conversion factors in Appendix B.

^b Derived from Gasbarro and Utermohle 1974. 19 households surveyed in Manokotak, 16 households surveyed in Aleknagik.

^c Derived from Nicholson 1976. Based on a survey of 15 households.

^d Not recorded.

by the Division of Commercial Fisheries, ADF&G, through the use of a permit and catch calendar system. The subsistence salmon catch has remained relatively stable in Togiak, Manokotak, Aleknagik, and Dillingham over the past two decades (Table 6).

As detailed in Wolfe et al. (1984), subsistence products in Togiak are harvested, processed, and distributed by domestic production groups composed primarily of close kin. Commercial fishing crews are also commonly drawn from family members. It is likely that the other small communities function in the same manner as Togiak.

TABLE 6. SUBSISTENCE SALMON HARVESTS IN THE TOGIAK AND NUSHAGAK BAY SUBREGIONS

Year	Number of Salmon ^a (Number of Permits Issued)			
	Togiak ^b	Manokotak	Aleknagik ^c	Dillingham ^d
1963				17,400 (71)
1964		6,100(19)	4,500 (16)	12,200 (58)
1965	8,600(36)		6,000 (16)	29,100 (88)
1966		7,110(24)	3,100 (9)	9,000 (53)
1967		10,900(30)	1,000 (4)	26,500 (84)
1968		3,700(12)	1,200 (5)	22,800 (86)
1969		6,300(24)	900 (2)	23,200(122)
1970		8,100(26)	1,200 (8)	33,300 (92)
1971		7,900(32)	2,500 (9)	16,500(105)
1972		3,900(34)	100 (2)	11,700(106)
1973		4,700(34)	1,000 (14)	19,300(137)
1974	12,900(68)	11,600(34)	2,100 (23)	23,200(156)
1975	9,800(41)	5,200(30)	2,000 (22)	19,700(232)
1976	4,800(30)	8,400(36)	2,000 (21)	15,400(176)
1977	4,400(41)	8,100(37)	1,500 (21)	15,700(187)
1978	2,700(29)	3,200(26)	2,600 (15)	20,300(203)
1979	2,000(25)	7,400(30)	1,000 (12)	18,300(254)
1980	5,800(46)	8,200(25)	3,500 (18)	35,600(318)
1981	5,400(52)	6,700(30)	2,900 (18)	23,200(281)
1982	4,200(50)	2,900(20)	2,500 (15)	24,700(275)
1983	4,400(38)	5,300(20)	1,900 (22)	20,200(282)

^a Rounded totals extrapolated from returned subsistence salmon reports, ADF&G Dillingham

^b Includes Twin Hills harvest

^c Referred to as Wood River harvests until 1978

^d Referred to as Nushagak Bay harvests until 1978

CHAPTER 4

HISTORIC SUBSISTENCE HARVESTS OF HERRING SPAWN-ON-KELP

Residents of the Togiak area have used herring spawn-on-kelp (melucuaq) for as long as local people can recall in oral traditions. Archaeological evidence of net fishing, a means likely used in the harvest of herring as well as salmon and Dolly Varden, has been found at "Old Togiak" (Kowta 1963) and to the north, just around Cape Newenham, at Chagvan Bay (Larson 1950, Ackerman 1964. cf. Dames & Moore 1978). Most ethnographic accounts of the northwestern Bristol Bay region concentrate on upper Nushagak Bay and make no mention of herring. Petroff (1881) was one of the few to visit and report on the Togiak area, but he failed to mention herring. He did note the use of a "very small list" of pelagic fish, without naming the species (Petroff 1881:43).

Elderly residents of the Togiak area recall harvesting and eating herring spawn-on-kelp all their lives. According to their reports, in the early 20th century kelp covered with layers of herring eggs was picked by hand at low tide along rocky shorelines. It was eaten fresh or preserved for later consumption by drying. Compared to staples such as seal, Dolly Varden, or salmon which were eaten many times each week for several months or more of the year, spawn-on-kelp was a special treat which was eaten occasionally and provided variety in the diet. Several residents reported that more was used in the past than is presently used.

TIMING AND LOCATION OF HARVEST

Elderly, life-long residents of the Togiak and Kulukak areas reported that in the first half of this century harvests of spawn-on-kelp took place between late April and early June. The timing varied somewhat from year to year depending upon when the herring spawned. Spawn-on-kelp was one of many resources harvested from coastal areas while people stayed in spring-summer shoreline camps. Prior to breakup, people travelled (aterquq, "move to spring camp") by dog team from winter settlements to sites along shore. Generally, camp sites were not reused regularly year after year. Instead, people selected whatever sites appeared to offer the best prospects for that year. No family or group from a village claimed particular areas: the entire coastal area used by a village was available to all residents.

Spring campsites were situated where women could harvest resources within walking distance from camp, while men ranged further in kayaks. Herring, spawn-on-kelp, clams, parky (ground) squirrels, bird eggs, over-winter berries, and firewood were among the resources caught or gathered by women and children from camp. Men caught seals (mostly spotted or harbor, but also a few ringed and bearded, and very rarely a ribbon), sea lions, walrus, waterfowl, brown bear, and ptarmigan, and gathered sea bird eggs from cliffs and spawn-on-kelp from rocky tidal areas. They also participated with other family members in harvests near the campsite.

Kulukak people moved to spring camps near the mouth of Kulakak Bay. Metervik Bay was a particularly favored location. After Kulukak was abandoned in the 1930s, many families continued to return to the bay each spring from their new residences by dogsled, and in more recent times by snowmachine.

Residents of "Old Togiak" commonly used the coastline east of their village as far as Right Hand Point (Nunaqaq), and west to Asigyukpak Spit (Assigyugpak) and the northern tip of Hagemeister Island (Ungluyaraq). Campsites were usually located at the heads of bays or similar protected sites. From villages up the Togiak River, only those men who had kayaks came down in spring to use coastal areas. Osviak people generally used the area between Tongue Point (Assigyugyak) and Asigyukpak Spit.

METHODS OF HARVEST, PROCESSING, AND CONSUMPTION

A long-time resident said that people did not pick kelp immediately after the first spawning occurred. These early herring (called aciirturtet, "those that run under") normally left only a thin layer of eggs, like polka dots, on the kelp. People waited for the second or later waves of spawners which deposited thick layers of spawn, and generally began picking a day after spawning occurred. People picked the kelp by hand when it was exposed at low tide, grabbing a bunch and snapping the plant off near the base or tearing it loose from the rocks. Sometimes a knife was used to cut the kelp off at the base. In the early 1970s, people began to use garden rakes to grapple for kelp below the water when desirable patches were not uncovered by the receding tide. Spawn-on-kelp was suitable for picking for just a few (3-5) days for once the eggs began to "eye up" (iingaqata, "got eyes"), they were no longer desirable.

To preserve spawn-on-kelp by drying, it was laid on clean rocks above high-tide line to drain and begin drying, and later was often draped atop the dead standing leaves of the previous summer's beach grass to complete the drying process. One Togiak resident recalled that the tips of the kelp (the

reproductive portion of the kelp) were broken off prior to consumption or storage because of the slime produced by those parts. Once dried, the spawn-on-kelp was stored in open weave grass baskets (kuusgun) and put away in a cool, dry place.

Salting developed as an alternative method of preservation. Commercial salt became available from Russian and American commercial salmon fishery. Wooden casks, most originally re used to hold the salted spawn-on-kelp. Eventually, many method of preservation.

Dried spawn-on-kelp was transported back to permanent winter villages in the summer or fall, and stored in the cache. Men ferried (ganiiq, "take supplies ahead") the bulk of the summer harvest home in repeated trips in their kayaks. Young children were often tucked down inside the kayak; and women occasionally rode behind the paddler, sitting back to back. More commonly, women and older children walked back to the winter settlement along shore or crossing overland.

When dried kelp was desired for consumption, it was soaked in fresh water for a day or longer until it regained its original size and texture. To ready salted kelp for eating, it was soaked in several baths of fresh water to leach out excess salt. Whether eaten fresh, or reconstituted from preserves, spawn-on-kelp was usually served with seal oil as a condiment. Each bite of kelp was dipped in seal oil as it was eaten.

CHANGES IN THE SUBSISTENCE HARVEST, 1930s-1970s

In addition to the changing settlement patterns already discussed in Chapter 2, other factors have influenced spring activities in the Togiak-

Kulukak area. The commercial salmon fishery developed in Nushagak Bay in the late 1800s. A few men from the Togiak-Kulukak area were drawn to Nushagak Bay to work in the canneries in the early 1900s, but it was not until the availability of imported labor was limited by the Second World War that it became common to hire local, Bristol Bay residents. Some men became fishermen at this time too. The traditional pattern of moving to spring camps was still followed, but in many families men left in late May or June for commercial fishing or processing work and did not return until late July. Some families returned to permanent settlements in early June prior to the departure of men to Nushagak or Kvichak salmon districts. In the men's absence, women assumed some additional harvesting activities, such as gillnetting herring and salmon. The development of a local salmon cannery at "Old Togiak" in the early 1950s gave Togiak residents the opportunity to become commercial fishermen operating from their own community. Manokotak commercial fishermen fished primarily for a cannery in Ekuk, across Nushagak Bay from the mouth of the Igushik River.

The initiation of commercial herring fishing in the Togiak district in 1967 brought about more changes. In its first ten years, the fishery was operated on a small scale with only 1-3 processors and from 11-39 fishing boats (all gillnetters except for 1 or 2 seiners) (Table 7). Most gillnetters were men from Togiak and Manokotak using their salmon skiffs, though a few fishermen from Nushagak Bay used 32 ft. salmon fishing boats. Some local women were hired to work aboard processors, salting sac-roe and spawn-on-kelp. Spawn-on-kelp was first harvested commercially in 1968 (Table 8). This fishery also started with nearly all participants coming from Togiak, Manokotak, and Aleknagik. Both commercial fishing and commercial kelping were centered near Metervik Bay, on the west edge of Kulukak Bay.

TABLE 7. COMMERCIAL HARVESTS OF HERRING (SAC-ROE) IN THE TOGIAK DISTRICT OF BRISTOL BAY

Year	Number of processors	No. of boats		Percent of catch		Total catch (metric tons)	Estimated value(\$)
		Gillnet	Seine	Gillnet	Seine		
1967	1	27	0	100	0	122	
1968	2	35	2	75	25	82	
1969	2	22	1	38	62	43	
1970	3	16	1	67	33	25	
1971	no fishery conducted						
1972	1	18	1	40	60	73	
1973	2	26	1	100	0	46	
1974	3	10	1	16	84	112	
1975	2	39	1	100	0	51	
1976	no fishery conducted						
1977	6	43	6	11	89	2,534	
1978	16	40	25	8	92	7,033	2,300,000
1979	33	350	175	40	60	10,115	6,700,000
1980	27	363	140	16	84	17,774	3,205,000
1981	28	106	83	18	82	11,374	3,988,000
1982	33	200	135	31	69	19,556	6,174,300
1983	23	250	150	19	81	24,486	10,517,300
1984	25	300	196	25	75	17,529	7,178,400

Sources: Middleton 1983, Lebida et al. 1984, and unpublished reports by the Division of Commercial Fisheries, ADF&G, Dillingham

TABLE 8. COMMERCIAL HARVESTS OF HERRING SPAWN-ON-KELP IN THE TOGIAK DISTRICT OF BRISTOL BAY

Year	Number of buyers	Number of fishermen	Number of deliveries	Harvest (pounds)	Estimated value(\$)
1968	1	1	6	54,600	
1969	1	3	20	10,125	
1970	1	5	23	38,855	
1971	1	12	43	51,795	
1972	1	12	32	64,165	
1973	1	10	11	11,596	
1974	3	26	49	125,646	
1975	2	44	98	111,087	
1976	5	49	118	295,780	
1977	5	75	266	275,774	
1978	11	160	349	329,858	119,800
1979	16	100	228	414,727	248,160
1980	21	78	186	189,662	94,600
1981	7	108	277	378,207	250,000
1982	8	214	167	234,924	176,193
1983	4	125	257	284,400	284,400
1984	6	330	412	406,587	203,000

Sources: Middleton 1983, Lebida et al. 1984, and unpublished reports of the Division of Commercial Fisheries, ADF&G Dillingham

The commercial activities drew people from Togiak and other villages. As noted earlier in this chapter, Togiak people previously had used areas to the west of Kulukak, closer to home. Tent camps and a permanent steam bath were built in Metervik Bay by residents of Togiak. Two permanent camps in Metervik continued to be used by families originating in Kulukak (then residing in Manokotak and Aleknagik), and many other people from Manokotak and Aleknagik (most with ancestral ties to Kulukak) camped during spring in Metervik, or at Kanik River (Qaneq) at the northeast head of Kulukak Bay. Many Manokotak hunters, and a few from Aleknagik, continued to travel to Kulukak Bay in the early spring by dogteam or snowmachine to hunt waterfowl and marine mammals. Some remained in camps through herring season. For the commercial herring fishery, Togiak, Manokotak, and Nushagak Bay fishermen travelled to the area in their fishing skiffs or boats.

In 1977, several new processors entered the commercial herring sac-roe fishery and each brought several seiners to catch fish for them. The catches in 1977 showed the potential of the fishery, and the number of processors increased to between 23 to 33 after 1979. Large numbers of seiners came north with the processors to participate in subsequent years (Table 7). The complexion of the fishery changed radically. Fishing was no longer confined to Kulukak and Metervik bays, but ranged west from Kulukak as far as the Tongue Point area on the southeastern edge of Togiak Bay. Small salmon skiffs, like those used by most Togiak and Manokotak fishermen, were no longer competitive. Some fishermen from Nushagak Bay continued to gillnet from their salmon boats, but most had a difficult time selling their catches because processors were set up to handle seiners and preferred to take their large volume catches.

As the commercial herring sac-roë fishery grew beyond local control, Togiak people who had travelled to Metervik to be on hand for the commercial fishery switched back to using traditional areas closer to home for spring activities. Residents of Manokotak, and Aleknagik, and a few from Dillingham (most originally from Kulukak) continued to use Kulukak and Metervik bays.

The commercial spawn-on-kelp fishery also grew in the late 1970s, probably due to the increased interest of processors. The number of processors increased from 5 in 1977 to 11 in 1978 and 21 in 1980, before dropping below 10 later in the 1980s (Table 8). Harvests also increased dramatically in the late 1970s, and have remained at high levels into the 1980s. Unlike the sac-roë fishery, the scale of harvest technology remained small, and the spawn-on-kelp fishery attracted few harvesters from outside of the local area. The Togiak and Kulukak groups have continued to be the primary participants in commercial spawn-on-kelp fishery.

CHAPTER 5

CONTEMPORARY USE OF SPAWN-ON-KELP FOR SUBSISTENCE

Many residents of northwestern Bristol Bay look forward each spring to harvesting herring spawn-on-kelp. Nearly all of these people belong to families who live, or once lived in coastal communities between Nushagak Bay and Cape Newenham and who grew up enjoying the unique crunchy texture and tart taste of herring eggs on kelp. Two main groups using subsistence spawn-on-kelp are readily discernible in the Togiak district during the herring season -- 1) the residents of Togiak and Twin Hills who make short trips from home by skiff or camp in the area between Togiak and Rocky Point; and 2) the people who camp at Kulukak and Metevik bays, primarily residents of Manokotak and Aleknagik. Each group has developed a pattern of use (Table 9) in response to the location of their permanent settlement relative to the herring spawning area, and to their level of participation in the commercial herring fishery.

THE "TOGIAK PATTERN"

Togiak and Twin Hills are located near the center of the herring spawning district with helping areas easily accessible within a short distance of their communities. In this section of the report, Togiak and Twin Hills will be jointly referred to as "Togiak", since they are located so close to one another and Twin Hills was settled by former Togiak residents. With the resource so near at hand, Togiak residents harvest spawn-on-kelp in a variety of circumstances.

TABLE 9. COMPARISON OF CONTEMPORARY TOGIAK AND KULUKAK "PATTERNS" DURING THE HERRING SEASON IN THE TOGIAK COMMERCIAL FISHING DISTRICT

	Togiak	Kulukak
Home residence of most participants	Togiak, Twin Hills	Manokotak, Aleknagik, Dillingham
Distance travelled to spawning areas	5-40 miles	20-40 miles minimum
Means of transportation	28' salmon skiff and/or 18' alum. skiff	32' salmon boat and 18' alum. skiff, or airplane
Composition of groups	Families and close relatives	Fishing crews are primarily adult male relatives. Spouses and children visit.
Length of time spent in helping areas	Primarily day trips, but some families camp for several days	Fishing crews and a few families camp for 2-3 weeks. Visiting relatives often fly over for a few days.
Spawn-on-kelp harvest method	Hand picking, or rake	Hand picking, or rake
Average quantity of spawn-on-kelp picked for home use	2.2 five-gallon buckets (n = 33 households interviewed)	2 five-gallon buckets (n= 6 households interviewed)
Preservation methods	Freezing, salting, and a small amount is dried	Salting and freezing
Sharing and distribution	Feasts, relatives and elders	Feast, relatives, and elders
Other subsistence resources harvested during herring season	Seals, herring, waterfowl, sealion, bird eggs	Seals, waterfowl, clams herring, bird eggs
Proportion taking part in commercial spawn-on-kelp harvest	Most	Most
Proportion taking part in commercial sac-roe harvest	Few	Most

Location and Timing of Harvest

Several families move to camps east of the village but most Togiak residents harvest herring spawn-on-kelp during day-long trips from their home community. Subsistence and commercial activities are inextricably related in many cases. In 1983, 76 percent of the commercial kelpers from Togiak interviewed reported they also harvested spawn-on-kelp for subsistence use (n = 25). (The 25 persons interviewed are probably about half of the total who delivered kelp in 1983, as 53 Togiak residents delivered spawn-on-kelp in 1982; no data are available for the number who delivered kelp in 1983 [Langdon 1983]). People generally picked spawn-on-kelp for personal consumption on a single tide just prior to returning home from commercial kelping, or kept a small amount from their commercial harvest. Specific trips were also made solely for subsistence harvests.

Subsistence harvest locations were unconstrained by commercial area designations. Subsistence harvests occurred during closed commercial periods in areas open to commercial harvest, in areas not opened to commercial harvest within the kelping management areas, and in places outside the commercial management areas. In 1983, several groups of Togiak residents picked kelp in the Rocky Point area on 11 May, four days after the last commercial opening in that area. Subsistence harvests also occurred near Osviak, an area not included in the commercial spawn-on-kelp management area, 10 days after the commercial season ended.

The harvesting period for subsistence spawn-on-kelp usually falls between the first of May and the first week of June. As noted in the historical section, people wait until sufficient spawning has occurred to produce many layers of eggs on the kelp, and consider it palatable for only a few days

following spawning. In 1983, an early year for herring, subsistence harvest occurred between 5 and 20 May. The 1983 commercial openings fell between 5 and 7 May. In 1982 and 1984 (the only other years in which data are available), the commercial openings ran from 21 to 24 May.

Methods of Harvest and Preservation

Picking is done by hand when the kelp is exposed by the tide, or by grappling below water from a skiff with a garden rake if the desired kelp remains submerged. For domestic consumption, many people said they preferred to pick by hand because it allowed them to be more selective. Care is taken to insure that the spawn-on-kelp they select has many layers of eggs, is not contaminated by sand or mud stirred up by wave action, and that the eggs have not started to eye up. The harvest is placed in 5-gallon plastic buckets or other containers as it is picked.

Spawn-on-kelp is consumed fresh. It keeps for several days if covered with salt water. Spawn-on-kelp also is preserved for longer storage. Freezing is the most common means of preserving spawn-on-kelp in Togiak (19 of 26 respondents; some used more than one method of preservation), while ten reported salting and eight drying (data from Langdon 1983, combined with Division of Subsistence data). Most who reported drying spawn-on-kelp said only small quantities are dried these days. Frozen kelp is thawed and soaked in fresh water to prepare it for eating. Like fresh, or reconstituted dried or salted spawn-on-kelp, thawed kelp is preferably eaten with seal oil as a condiment.

Quantities Harvested

An average of 2.2, 5-gallon buckets (s.d.-1.5) was reported harvested

in 1982 by 33 Togiak fishermen (data from Langdon 1983, combined with Division of Subsistence data). More than half (54 percent) said they took two 5-gallon buckets with others reporting as little as 2 pounds and as much as 8 buckets. A 5-gallon bucket of kelp weighs about 40 pounds.

Consumption and Distribution

Spawn-on-kelp is eaten occasionally as long as the supply lasts. Most people said it was usually served as a special treat at birthday or holiday feasts, or whenever something different was desired in the diet. Most Togiak residents reported the supply they picked each spring would last them throughout most of the following year, since spawn-on-kelp was only eaten a few times a month at most.

People gave spawn-on-kelp to relatives and old people within their community, particularly to those who were unable to gather kelp for themselves. Twenty-five of 36 residents said they shared with others (data from Langdon 1983, combined with Division of Subsistence data). Some recalled distributing spawn-on-kelp to relatives in Dillingham, Manokotak, Akiachak, and Bethel in recent years. Serving spawn-on-kelp at feasts is a common way that spawn-on-kelp is shared. Large numbers of relatives and friends are invited to eat at feasts celebrating birthdays and holidays.

Relationship with other Subsistence Activities

Other subsistence activities occur opportunistically while people are out principally to pick spawn-on-kelp. Some people net herring to dry or salt for consumption at home. Rifles and shotguns are taken along in case the chance arises to harvest seals or waterfowl, though most spring water-

fowl hunting occurs prior to the arrival of herring. Occasionally, a sea lion is taken, especially if a young one presents itself. If the herring season falls unusually late in the spring, people said they might collect bird eggs while out primarily after spawn-on-kelp. The annual round of subsistence activities is described in Chapter 3.

Observations During the 1983 Commercial Herring Season

This section describes resource harvest activities in the Togiak area between 4 and 8 May 1983. Ten to 12 families were camped between Togiak and Rocky Point on 5 May 1983. Most had arrived that morning or the day before to set up camp and be prepared for openings in commercial kelping. Two cabins and a steambath are located at Kangeracunyarpaq, and at least one family regularly returns each spring to use the site. Others camp in tents if herring are spawning nearby. There are no permanent structures at Kangeracunayaluk; people set up tents there when it appears it will be a good place for kelping. Members of eight parties were interviewed at these campsites. Of these, six party leaders were residents of Togiak, one lived in Twin Hills, and one lived in Anchorage (the latter two were born in and lived in Togiak until the last 3-5 years).

When interviewed, most people said they usually camped for 3-4 days at a time, but stayed longer or came back over to stay again if commercial openings were extended. All said they returned home on Sundays for church. Most travelled to the area in their outboard-powered 28 ft. plywood skiffs with a 16-18 ft. aluminum skiff in tow. Others used an aluminum skiff alone.

All eight groups were composed of close relatives: five were parent(s) and offspring (two of the five included grandchildren); one was an uncle with a niece and nephew; one was composed of three brothers-in-law; and the eighth

was an individual. Ages ranged from 3 to 65 years, and parties included from 1 to 9 individuals.

The commercial kelping area in the Togiak district lies between Togiak and Kulukak bays and is divided into 10 "kelp management areas" (Fig. 5). A desired harvest level is determined by the Division of Commercial Fisheries, ADF&G and used as a quota for each of the 10 areas. Areas are opened if there is an adequate stand of kelp and it appears that sufficient spawning to support a commercial harvest has occurred. Deliveries to commercial buyers are monitored by the Division of Commercial Fisheries and areas are closed when harvests in an area exceed or approach the desired harvest quota.

Once an opening of commercial kelping was announced, many more Togiak people travelled to the opened spawning areas and stayed for the duration of the opening (usually 24 hours or less). Most of these kelpers returned home to sleep, but some slept aboard their salmon skiffs or on shore if openings were extended or if weather and sea conditions prevented their return home.

During the first commercial opening for kelping in 1983 on 5 May, there were approximately 35 skiffs and more than 100 people from Togiak present between Kangeracunyaluk and Kangeracunyarpaq. Fewer than 5 boats and 15 people from communities other than Togiak and Twin Hills participated in the harvest in this area. Harvesting groups were composed of both males and females with all ages represented, but most participants appeared to be between the ages of 16 and 50. Among 23 commercial kelping crews from Togiak interviewed, all but two were composed of relatives (Langdon 1983).

The majority of the commercial harvesters remained in the area to pick in the dark during the next low tide, and then returned home to Togiak in the early morning. A second 24-hour opening was announced the following day.

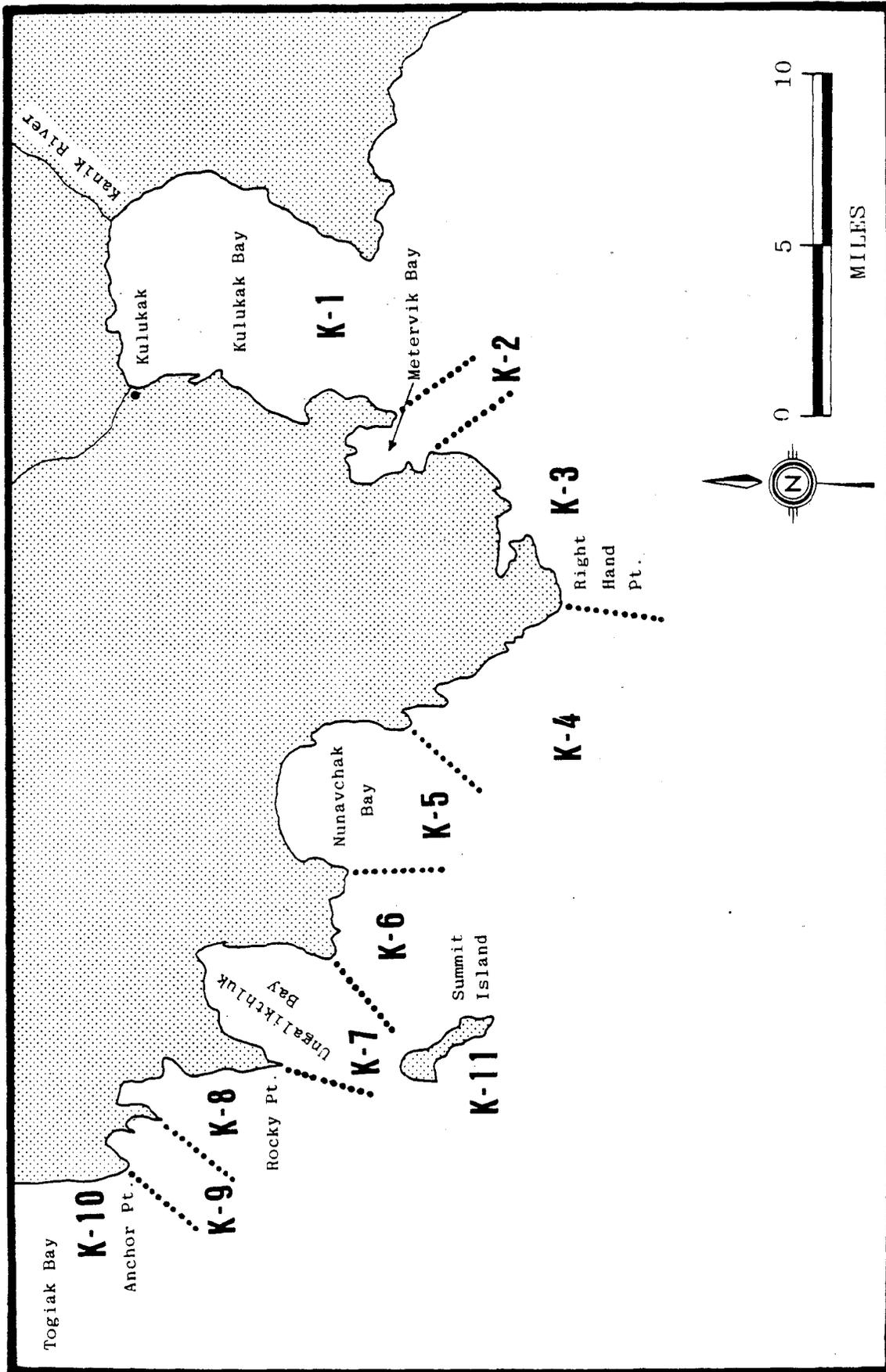


Fig. 5. Commercial Herring spawn-on-kelp management areas in the Togiak District

The small bays around Kangeracunayaluk and Kangeracunvarpaq (kelp management areas K-9 and K-8 in Fig. 5) were not reopened for the second opening because harvests during the first opening exceeded or came close to the quota set prior to the season.

The next day, 6 May, all areas between Rocky Point and the southwest edge of Metervik Bay (K-7 to K-3) were open to commercial kelping. Arriving from their community and camps, Togiak residents prospected areas nearest home, K-7, 6, and 5, but most ended up travelling to the area between Right Hand Point and Metervik Bay (K-3) where more commercially-valuable spawn-on-kelp was available. A last opening occurred on the following evening, 7 May for 12 hours. Most commercial kelping by Togiak residents in that period took place in Ungalikthluk Bay, area K-7, closer to home and camps. Thirty-three skiffs were in the southwest corner of the bay, near Rocky Point, six were along the eastern shore of the bay, and one was in area K-6.

Importance of the Commercial Fishery

Commercial harvests of spawn-on-kelp are very important to many Togiak families because it is their first opportunity each spring to earn cash after living for 4-5 months on credit. Among 25 commercial pickers from Togiak, 76 percent reported they made less than \$2,000 kelping. The earnings from kelping accounted for 10 percent or less of a family's income from commercial fishing in 20 of 22 households (Langdon 1983). Yet, the money is the first available after an often financially unproductive winter.

Remarkably few Togiak fishermen take part in the herring sac-roe fishery, even though it occurs right offshore of their community and entry to the fishery is not limited. In 1983, only 7 of 47 commercial salmon captains

reported participating in the herring sac-roe fishery. Only three were captains of vessels that delivered herring (Langdon 1983). In 1982, 19 boats from Togiak delivered commercial herring, compared to 86 commercial salmon fishermen with limited entry drift-net permits active in 1982. Fifty-three residents of Togiak delivered spawn-on-kelp for commercial sale in 1982 (Wolfe et al. 1984).

Several factors inhibit participation by Togiak fishermen in the commercial herring sac-roe fishery. Large capacity boats of fishermen from outside the Togiak region have a great advantage over the small, plywood salmon skiffs which make up 90 percent of the Togiak commercial fishing fleet. To compete in the sac-roe fishery a large investment in nets, reels, and other gear is required to adapt salmon boats for herring, and the small Togiak craft are ill suited for conversion. In addition, secure markets for gill-net caught fish were not available until very recently. In some seasons, gill-net fishermen could not find a buyer for their catches and were forced to dump their herring.

In contrast, existing salmon skiffs and smaller 16 and 18 ft. aluminum skiffs are adequate for the spawn-on-kelp fishery. Until 1984, all picking was done at low tide by hand or rake, so no special equipment was required. In 1984, for the first time, diving gear was used in the Togiak herring spawn-on-kelp fishery. Eight (all from outside of the Bristol Bay region) of 330 kelpers used diving equipment, and reportedly delivered 10 percent of the total harvest (Division of Commercial Fisheries, ADF&G, Dillingham, pers. comm., 1984).

THE "KULUKAK PATTERN"

This group of participants in the subsistence harvest of spawn-on-kelp is primarily composed of former residents of Kulukak or Togiak, and their descendants, who now reside in the communities of Manokotak, Aleknagik and Dillingham. The majority are concentrated in Manokotak and Aleknagik. None of these communities are located on the shores of the herring district. Manokotak lies 20 miles east-northeast of Kulukak Bay on the Igushik River, which drains into the western side of Nushagak Bay. There are several traditional portages and trails between the Kulukak and Igushik drainages. Aleknagik is located about 40 miles from Kulukak Bay, at the outlet of Aleknagik Lake at the start of Wood River which flows into the head of Nushagak Bay. Trails connect Aleknagik to the Igushik, Kulukak, and Togiak Drainages.

Today, most people from these communities travel to the Togiak herring district in 32 ft. commercial salmon fishing boats with 18 ft. aluminum skiff in tow, or by charter airplane. Commercial fishing crews, or the captain and his family, commonly go by boat down Nushagak Bay, rounding Cape Constantine, and heading north-northwest to Kulukak Bay. Most anchor in the protected mouth of Kanik River where three cabins, a permanent steam bath, and a few tent frames are located on the western bank. Wives and children, and other relatives, generally fly over to spend weekends or other short periods. In 1984, seat fares from Manokotak to Kulukak ranged from \$25 to \$40 each way, and from Dillingham or Aleknagik the fare was \$50 to \$60.

One family from Manokotak traditionally spends the herring season in their cabin, with adjacent steam bath, at a site (Cukaraq) by the creek entering the head of Metervik Bay. They usually fly to their cabin because they do not bring a 32 ft. boat around from home and they do not participate

in the commercial herring fishery. A few relatives often anchor their 32 ft. boats near the cabin on the long mud flats at the head of the Metervik Bay.

The common pattern is for the fishing crews to camp aboard their 32 ft. fishing boats for the 2 to 3 week duration of the commercial herring sac-roe and spawn-on-kelp fisheries, while women and children fly over for a few days at a time during closures of the commercial fisheries to participate with the men in subsistence activities. Most crews are composed of a captain and 2 to 4 crew members. Crew members are primarily relatives of the boat captain. Some wives and families accompany their husbands or fathers for the entire period.

Location and Timing of Harvest

Residents of Manokotak, Aleknagik, Dillingham, and other northern Bristol Bay communities pick spawn-on-kelp for subsistence use while their families are present in the Kulukak area during the commercial herring season in May and early June. Most of the subsistence harvest of spawn-on-kelp takes place in Kulukak and Metervik bays in between periods of commercial fishing activity. People often go to areas that were not opened to commercial picking because areas that had been open are sometimes "picked clean." Some people take spawn-on-kelp from their commercial harvest for subsistence use. One Manokotak resident said that some people pick only during commercial periods because they are unsure when it is legal to take subsistence harvests. Thus, harvests take place in a variety of locations, including open and closed commercial management areas in Kulukak and Metervik bays, either during commercial periods or at times when the commercial fishery is closed.

Methods of Harvest and Preservation

As with Togiak people, spawn-on-kelp for domestic consumption is primarily picked by hand by Kulukak people so that the highest quality can be selected. Some younger people, in their 20s and 30s, say they eat up their spawn-on-kelp right away, so they just keep it in 5-gallon plastic buckets filled with saltwater. Salting appears to be the favorite means of preservation among those who store kelp for use through the winter, though some is preserved by freezing. The same methods as described for Togiak are used to prepare preserved kelp for consumption.

Quantities Harvested

Of six households interviewed in 1982 in the Kulukak area, an average of two 5-gallon buckets were harvested per household. Reported harvests ranged from 1 to 4 buckets. People said they occasionally took more if they were picking for another household or family in addition to their own.

Consumption and Distribution

The pattern of use and distribution described for Togiak holds for this group also. Some younger families do not preserve any spawn-on-kelp and consume their harvest within a week or so after the end of the herring season; while others reported that it lasted them all year. Among those who salted or froze kelp, holidays and feasts were the times they generally reported preparing the stored kelp for consumption. Kelp is widely shared during these meals when large numbers of family and friends are invited. Most people in Kulukak questioned about sharing and distribution said that they frequently give portions of their harvest to other family members living in separate

households and to old people in their home communities.

Relationship With Other Subsistence Activities

While people are camped in Kukukak and Metervik bays, many people participate in other subsistence pursuits besides harvesting herring spawn-on-kelp. One of the favorite activities on low tides during closed fishing periods is clam digging on the mud flats south of Kanik River in Kulukak Bay. People eat clams while camping and also take them home to eat at the end of herring season. Some families gill-net herring and preserve them by drying or salting. Hunters travel out in the bay in skiffs during closures of the commercial fisheries to catch spotted seals or travel up the rivers after waterfowl and cranes. People also search for gull eggs if the birds have started nesting. The annual cycle of activities is described in Chapter 3.

Observations During the 1983 Commercial Herring Season

This section describes the resource harvesting activities observed in the Kulukak area during the commercial herring season in 1983. The large orange hulls of the Japanese longliners dwarfed the rest of the herring fleet in Kulukak Bay in 1983. Since Bristol Bay gill-netters negotiated a joint venture with the longliners in 1982, a strong gill-netting effort in the commercial herring sac-roe fishery has developed among Nushagak Bay fishermen. Fishermen from Manokotak and Aleknegik participate alongside other 32 ft. boats from the Bristol Bay salmon fleet.

During a closure of the commercial fishery on 11 May 1983, there were

two Aleknagik fishermen anchored in Metervik Bay with 3 or 4 other 32 ft. gill-netters; while over in the mouth of Kanik River there were approximately fourteen 32-footers from Manokotak, 5 from Aleknagik, a couple from Dillingham, and a few boats from Naknek. In Kanik River, the Manokotak boats either tied up on the beach below the cabins and tents, or in a protected, deep bend of the river 100 yards upstream. The fishermen had been waiting for another opening of the commercial sac-roe fishery since 5 May. Most had participated in the commercial spawn-on-kelp openings of 6-7 May, picking in areas K-3 and 4. The first commercial kelp opening on 5 May, overlapped with a commercial sac-roe period. Fishermen in the Kulukak area did not bother to rush over to areas K-7 to 9 in the dark after the sac-roe period ended to participate in the final hours of that opening.

On 8 and 9 May, three groups from Manokotak and Aleknagik were picking subsistence spawn-on-kelp, splitting and hanging herring to dry, and butchering seals in Metervik Bay. On 11 May, several parties from the Kanik River camp were out in skiffs hunting, while a few groups were on the flats at low tide digging clams.

In the late afternoon of the 11th, an opening of the commercial sac-roe fishery was announced for that night, catching the Manokotak fleet in the river with the tide out. Hunters returned to their boats to prepare for the opening; one party brought home two seals in their skiff. Some fishing boats sent a small crew out in a skiff with one shackle (50 fathoms) of gear to take part at the start of the opening, but most skippers waited for the tide to come up so they could get their 32 ft. boats out of the creek and start fishing. The opening that night proved to be the last of the season. The boats from Manokotak and Aleknagik remained anchored in Kanik River and

Metervik Bay for several more days with the hope that another commercial opening would be announced. Many people dug clams and hunters in skiffs explored the rivers and the bay.

Importance of the Commercial Herring Fisheries

Since a secure market for gill-net caught herring by local residents of Bristol Bay became available in the early 1980s, a number of fishermen from Manokotak, Aleknagik, Dillingham, and other communities have actively participated in the sac-roe fishery. Their income from the herring sac-roe harvest is not known, but in good years it probably accounts for a significant portion of some fishermen's total income. It has provided the fishermen with another opportunity to insure that boat payments and other fixed costs are met each year. Previously, most had been totally dependent upon the unpredictable commercial salmon fishery in Bristol Bay. Most of the Kulukak fishermen involved in the herring fishery now operate modern 32 ft. salmon boats that were purchased following the bumper salmon harvests of the late 1970s and early 1980s. Many of these same fishermen were using plywood skiffs in the herring sac-roe fishery in the late 1960s and the early 1970s.

The Kulukak fishermen continue to participate in the commercial herring spawn-on-kelp fishery, though priority is normally placed on the commercial sac-roe fishery. If openings in the two fisheries overlap, most Kulukak fishermen choose to fish for sac-roe.

OTHER PARTICIPANTS IN THE COMMERCIAL HERRING FISHERIES

Prior to the growth of the Togiak herring sac-roe fishery, most of the participating commercial fishermen were residents of Togiak, Manokotak, Aleknagik, Dillingham, and other northern Bristol Bay communities. Since 1977, commercial fishermen from Southeast Alaska, Prince William Sound, Cook Inlet, Kodiak, Chignik, the Lower Alaska Peninsula, the Aleutians, and the lower 48 states have flocked to the Togiak herring fishery. None of these fishermen were observed picking spawn-on-kelp for domestic consumption in 1983, and no interviews were conducted with them on the herring grounds.

The chairmen of the Fish and Game Advisory Committees in King Cove, Sand Point, and Chignik were interviewed on the telephone in the winter of 1983-84. Each of these men participates in the Togiak commercial sac-roe fishery aboard a seiner. They knew of a few fishermen who brought salted herring home for pickling, but had no knowledge of any commercial fishermen from their home communities, or other communities they were familiar with (such as Kodiak), that harvested spawn-on-kelp for subsistence use. A commercial gill-netter from Petersburg who fishes each year in the Togiak herring sac-roe fishery and who has tendered commercial spawn-on-kelp harvests was also interviewed over the phone. He could not recall any fishermen from his region picking spawn-on-kelp in the Togiak district for consumption at home, though he did remember a few southeast fishermen pickling some herrng.

Although subsistence permits were not reequred by regulation, permits for harvesting herring spawn-on-kelp for subsistence use were issued by the Division of Commercial Fisheries, ADF&G, in Dillingham, to individuals requesting them between 1978 and 1982. Twelve residents of Dillingham were

issued permits, 10 from Aleknagik, 5 from Manokotak, 2 from Clarks Point, and one from Kasigluk (on the Yukon-Kuskokwim Delta), Homer, and Kodiak. Thus, it appears that at least a few people from outside the northern Bristol Bay area are interested in harvesting herring spawn-on-kelp for consumption at home.

CHAPTER 6

SUMMARY

In the early 20th century, and likely long before, residents of a number of communities between Nushagak Bay and Cape Newenham harvested spawn-on-kelp for personal consumption and to distribute in traditional means among relatives and friends. In the 1930s to 1950s, the area's population consolidated into the contemporary communities of Togiak, Manokotak, and Aleknagik, with a few families moving to other communities, such as Dillingham. People from these contemporary communities continue to harvest herring spawn-on-kelp each spring in the Togiak district. Herring spawn between late April and early June each year in the Togiak district. Harvests of spawn-on-kelp for subsistence use occur within a week after spawning.

Spawn-on-kelp for subsistence use is generally picked by hand, though rakes are occasionally used. Within the Togiak herring district, access to the spawning areas is gained by use of 16 to 18 ft. aluminum skiffs, which are used in a variety of subsistence and commercial activities throughout the year. Commercial 28 ft. plywood "Togiak" salmon skiffs or 32 ft. "Bristol Bay" salmon boats are also used to travel to and within the herring district. These boats are used in commercial herring and salmon fisheries, and are also used in some subsistence activities by some fishermen.

Residents of Togiak normally harvest herring spawn-on-kelp within a few hours skiff ride from their homes in the area between Right Hand Point (about 25 miles southeast of Togiak) and Osviak (about 40 miles southwest).

Residents of Manokotak, Aleknagik, Dillingham, and other Nushagak Bay

communities who eat spawn-on-kelp generally pick it in the Kulukak and Metervik bay area, where their families traditionally have lived and camped in the spring. Manokotak lies about 20 miles east-northeast of Kulukak Bay; Aleknagik and Dillingham are about 40 miles from Kulukak Bay. People travel to Kulukak Bay from these communities in 32 ft. commercial fishing boats, about a 12 hour run, or by plane.

As spawn-on-kelp is picked, it is placed in five-gallon plastic buckets or other containers and covered with salt water until consumed or preserved. Today, freezing and salting are the most common methods of preservation. A few families report they still preserve some by drying. For freezing, kelp is usually placed in one-gallon sized plastic bags; the five-gallon buckets are generally used for salting.

In the past, spawn-on-kelp was preserved by drying and stored in open-weave grass baskets tucked away in caches. Salting was introduced either by Russian or American traders in the 19th century, or by the commercial fishing industry in the late 1800s. Freezing became practical only in the last decade since dependable electric power became available in most of the communities. As in the past, people today prefer to eat their spawn-on-kelp dipped in seal oil.

Kelping groups at camps in the Togiak area are commonly composed of families, with members ranging in age from 3 to 65 years old. Togiak people travelling to the herring grounds on short trips were more frequently composed of family members between their late teens and 60 years of age. In the Kulukak area, it is more common to find camping parties made up of commercial fishing crews composed mostly male relatives and friends between the ages of 16 and 65. Many of their families come over to the herring grounds during closures of the commercial fishery or on weekends. A few families camp in

Kulukak and Metervik bays for the duration of the herring season.

As described above, harvesting groups are primarily composed of relatives. The product of the harvest is commonly shared with relatives and friends in the harvesters' home community during feasts celebrating birthdays or holidays. Gifts of spawn-on-kelp were commonly reported, particularly to relatives and elders within the donors' home community who could not participate in the harvest themselves. Togiak residents also recalled giving kelp to relatives in the Kuskokwim and Nushagak Bay areas.

Herring spawn-on-kelp is a favored food among the majority of households in Togiak, Manokotak, and Aleknagik. Additional households in Twin Hills, Dillingham, and other communities in Bristol Bay and elsewhere also eat spawn-on-kelp. It is one of more than 65 wild resources known to be used by residents of the Togiak and Nushagak Bay areas. Although spawn-on-kelp is avidly harvested and consumed, it is used in relatively small quantities compared to such dietary staples as salmon, Dolly Varden, seals, moose, caribou, and even small game such as ptarmigan and hare. About 15 lbs of herring spawn-on-kelp are harvested annually per capita in Togiak, Manokotak, and Aleknagik, whereas harvests of both salmon and Dolly Varden likely range between 150-300 lbs per person. Spawn-on-kelp provides variety in the diet and is served as a special treat during celebrations throughout the year.

REFERENCES

- Ackerman, R.E.
1964. Pre-history in the Kuskokwim-Bristol Bay Region, Southwestern Alaska. Laboratory of Anthropology, Washington State University, Pullman. Report of Investigations No. 26.
- Alaska Department of Community and Regional Affairs
1982. Community Planning Profiles for Aleknagik, Manokotak, Dillingham. Prepared by DOWL Engineers, with North Pacific Aerial Surveys and Bristol Bay Native Association.
- Alaska Department of Fish & Game, Division of Commercial Fisheries
n.d. Unpublished reports and office files, Dillingham.
- Behnke, S.R.
1982. Wildlife Utilization and the Economy of Nondalton. Division of Subsistence, ADF&G, Juneau. Technical Paper No. 47.
- Dames & Moore
1978. The Social and Economic Impacts of a Commercial Herring Fishery on the Coastal Villages of the Arctic/Yukon/Kuskokwim Area. Prepared for the North Pacific Fishery Management Council.
- Gasbarro, A.G. and G. Utermohle
1974. Unpublished field data, Bristol Bay Subsistence Survey. Office files, Division of Subsistence, ADF&G, Dillingham.
- Kowta, M.
1963. Old Togiak in Prehistory. Ph.D. dissertation. University of California, Los Angeles.
- Langdon, S.J.
1983. The Togiak Fisheries Survey. Unpublished report. Department of Anthropology, University of Alaska, Anchorage.
- Larsen, H.
1950. Archaeological Investigations in Southwestern Alaska. American Antiquity 15(3):177-186.
- Lebida, R.C., C. Whitmore, and G.J. Sandone
1984. Pacific Herring Stocks and Fisheries in the Eastern Bering Sea, Alaska, 1984. Report to the Alaska Board of Fisheries. Bristol Bay Data Report, No. 84-14.
- Middleton, K.R.
1983. Bristol Bay Salmon and Herring Fisheries, Status Report through 1982. Division of Commercial Fisheries, ADF&G, Juneau. Information Leaflet No. 211.

- Nebesky, W., S. Langdon, and T. Hill
1983. Economic, Subsistence, and Sociocultural Projections in the Bristol Bay Region. Bristol Bay Cooperative Management Plan and Refuge Comprehensive Plans, U.S. Fish and Wildlife Service, U.S. Department of the Interior, Anchorage.
- Nicholson, W.H.
1976. A Subsistence Activity Report for Aleknagik for 1975: a Village in Bristol Bay. Bristol Bay Native Association, Dillingham, Alaska.
- Oswalt, W.H.
1967. Alaskan Eskimos, Scranton, Pa: Chandler Publishing Co.
- Petroff, I.
1881. Population and Resources of Alaska. 1880 U.S. Census, Department of the Interior.
- Rollins, A.M.
1978. Census Alaska: Numbers of Inhabitants, 1792-1970. University of Alaska Anchorage Library, University of Alaska, Anchorage.
- VanStone, J.W.
1967. Eskimos of the Nushagak River: An Ethnographic History. Seattle: University of Washington Press.
- Wolfe, R.J.
1981. Norton Sound/Yukon Delta Sociocultural Systems Baseline Analysis. Alaska Outer Continental Shelf Office, Bureau of Land Management, U.S. Department of Interior, Anchorage, Alaska Technical Report 72.
- Wolfe, R.J., J.J. Gross, S.J. Langdon, J.M. Wright, G.K. Sherrod, L.J. Ellanna, and V. Sumida
1984. Subsistence-based Economies in Coastal Communities of Southwest Alaska. Division of Subsistence, ADF&G, Juneau. Technical Paper No.89.
- Wright, J.M., Morris, J.M., and R. Schroeder
1985 Bristol Bay Regional Subsistence Profile. Division of Subsistence, ADF&G, Juneau. Technical Paper No. 116.

APPENDIX B

CONVERSION FACTORS USED TO ESTIMATE DRESSED WEIGHT OF ANIMALS

Resource	Dressed weight (lbs) ^a
Red salmon	4.0
King salmon	14.0
Silver salmon	5.0
Chum salmon	4.4
Pink salmon	2.2
"Salmon" (predominantly reds)	5.0
Dolly Varden	1.4
Rainbow trout	1.4
Lake trout	2.7
Grayling	0.7
Whitefish	1.0
Pike	2.8
Burbot	1.0
Smelt	0.3
Herring	0.4
Moose	540.0
Caribou	150.0
Brown and black bear	100.0
Beaver	20.0
Porcupine	8.0
Arctic hare	5.6
Snowshoe hare	2.0
Spotted/harbor and ringed seals	56.0
Bearded seal	140.0
Belukha	700.0
Geese	4.0
Ducks	1.4
Cranes	6.0
Ptarmigan	0.7
Spruce grouse	1.0

^a primarily from Behnke 1982 and Wolfe 1981

