

REPORT TO THE BOARD OF FISHERIES,
SOUTHEAST ALASKA-YAKUTAT HERRING FISHERIES,

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by

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and
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ABSTRACT

Herring in Southeast Alaska and Yakutat are harvested in commercial bait, commercial sac roe, commercial spawn-on-kelp, subsistence spawn-on-kelp, and personal use fisheries. Prior to 1967 a reduction fishery accounted for most of the harvest with a historic high of 78,749 tons in 1929. A winter bait fishery has generally occurred every year since the turn of the century. The sac roe fisheries became the dominant fishery beginning in 1971. A wild spawn-on-kelp fishery occurred between 1963 and 1969 with a closed pound fishery authorized by the Board of Fisheries beginning in 1990. During the 2001–2002 season, the total regional commercial harvest of herring and commercial spawn on kelp was 11,509 tons and 171.9 tons, respectively. The sac roe harvest and winter bait fishery totaled 10,854 tons and over 337 tons, respectively. The harvest of 171.9 tons of spawn on kelp produced an exvessel value for the fishery of \$2,113,801. Test fisheries conducted in Sitka, West Behm Canal, and Seymour Canal harvested 311 tons of sac roe with an exvessel value of \$112,128. Three fresh bait pounds were operated in Southeast Alaska during the 2001–2002 season, resulting in a small harvest near Sitka, and no fishery occurred in Yakutat.

INTRODUCTION

This report summarizes historical harvests and management actions for commercial herring fisheries in Region 1 through the 2001–2002 season with an outlook for the 2002–2003 season. The Southeast Alaska Region is a composite of two statistical areas. Area A, the Southeast Alaska area, encompasses the waters south of Cape Fairweather and north of the International Boundary at Dixon Entrance. Area D, the Yakutat area, extends west from Cape Fairweather to Cape Suckling (Figure 1). Commercial winter bait, sac roe, spawn-on-kelp, and fresh bait pound fisheries occur in the Southeast Alaska area. Only a winter bait season is provided by regulation in the Yakutat area. Subsistence and personal use harvesting of herring and spawn on kelp occurs in both areas.

History of the Herring Fishery

Pacific herring stocks are found throughout Southeast Alaska. The stocks vary greatly in size and productivity. In general, the stocks that spawn on the outer-coastal areas are more productive than stocks that spawn in the inside waters. Southeast Alaska herring stocks have been commercially harvested since a salting operation was initiated in the 1880s. From the 1890s to the mid-1960s the catch was used primarily to supply herring for reduction to meal and oil. The reduction fishery occurred on mixed stocks of feeding herring during the summer months. The reduction fishery production peaked during the 1920s and 1930s when annual harvests commonly exceeded 50,000 tons (Table 1). The reduction industry was phased out in the mid 1960s due a decline in the abundance of herring and to the development of the Peruvian anchovy reduction industry.

Southeast Alaska herring stocks have historically supplied most of the bait for Alaskan commercial longline and pot fisheries. This harvest occurs during the fall and winter months, a time when bait quality is best, on discrete wintering schools in major bays and inlets. All of the bait harvest is taken by purse seine gear. Relatively small quantities of herring have been harvested for fresh bait pounds. Existing regulations provide for a tray-pack bait fishery designed to produce a sport and commercial troll bait product; however, very little harvest has occurred for this purpose in recent years. A limited number of tray-pack permits have been issued in the Ketchikan area for the 2002–2003 season.

Currently, most of the annual herring harvest is taken in the spring sac roe fishery, which developed in the early 1970s. The sac roe fishery takes herring immediately prior to spawning when egg maturity is highest. A wild, spawn-on-kelp fishery occurred during the 1960s; however, this fishery was phased out in 1969. A new herring spawn-on-kelp pound fishery was approved by the Alaska Board of Fisheries to begin in the spring of 1990 in Hoonah Sound and in 1992 the Alaska Board of Fisheries created a spawn-on-kelp fishery for the Craig/Klawock area.

Subsistence herring products have traditionally included spawn on kelp and herring spawn on hemlock branches. Commercial fishing regulations allow commercial fishers to harvest herring for their own bait.

The commercial utilization of Southeast Alaska herring resources has been historically controversial and that remains true today. The subsistence and personal use harvest levels are a minor portion of the total annual take, but are considered very important to the lifestyle and culture of local residents. Commercial

harvesting is viewed by much of the public as having a great impact on the local availability of herring. Additionally, herring are a major forage fish and their abundance at fairly high levels is commonly viewed as necessary to ensure healthy populations of predatory fish such as salmon and halibut and associated marine life such as marine birds and several species of marine mammals.

Management Strategy

The following management plan for Southeast Alaska commercial herring fisheries was formalized at the January 1994 Board of Fisheries meeting.

5 AAC 27.190. HERRING MANAGEMENT PLAN FOR STATISTICAL AREA A. For the management of herring fisheries in the Southeastern Alaska Area, the department:

- (1) shall identify stocks of herring on a spawning area basis;
- (2) shall establish minimum spawning biomass thresholds below which fishing will not be allowed;
- (3) shall assess the abundance of mature herring for each stock before allowing fishing to occur;
- (4) except as provided elsewhere, may allow a harvest of herring at an exploitation rate between 10 percent and 20 percent of the estimated spawning biomass when that biomass is above the minimum threshold level;
- (5) may identify and consider sources of mortality in setting harvest guidelines;
- (6) by emergency order, may modify fishing periods to minimize incidental mortalities during commercial fisheries.

A "threshold level" is the minimum herring biomass needed to ensure sustained yield and maintain biological productivity. Threshold levels have been established for each of the winter bait, sac roe, and spawn-on-kelp pound spawning stocks. Threshold levels are based on all available stock performance data and may be evaluated and revised over time. Current threshold levels vary from 1,000 to 20,000 tons for the major sac roe, winter bait, and pound fishery stocks in various areas (Table 3).

Herring stocks with a spawning biomass of less than 2,000 tons, of which there are many, are not considered for harvesting in either the Southeast Alaska winter bait or sac roe fisheries. Under the current approach for setting seasonal harvest limits, herring stocks of 2,000 tons of adult fish would allow for an annual harvest of 200 tons of herring. The region's current management capability prevents successful management of the winter bait or sac roe fisheries for harvests of less than 200 tons. The exceptions are the Hoonah Sound spawn-on-kelp fishery, and the Yakutat winter bait fishery (outside of Yakutat Bay, which is closed to commercial herring fishing), where the spawning threshold is 1,000 tons.

Annual harvest limits are based on a graduated scale that allows for higher harvest rates as the herring population increases relative to the threshold level (Figure 2). When the estimate of mature spawning stock is at the threshold level, a 10% harvest is allowed. The harvest rate increases 2% each time the estimated spawning biomass increases by an amount equal to the threshold level. The harvest rate reaches a maximum of 20% when the population is six times the threshold level. The approach allows for an annual harvest rate of between 10–20% of the mature herring if the established spawning threshold levels are satisfied. No harvesting is allowed if the biomass estimate for the stock is less than the threshold.

Historically, there have been two direct observation methods for estimating biomass of herring stocks in Southeast Alaska: (1) post-spawning egg deposition dive surveys and (2) vessel hydroacoustical surveys. In cases where egg deposition surveys are used, the biomass estimate uses data only for mature herring that spawned that season. For those instances where the population estimate was derived acoustically, only those herring that would be expected to contribute to the spawn are included in the estimate. Acoustic surveys have not been used to estimate biomass since the 1993–1994 season. Beginning in 1994, the department modified the primary method of forecasting herring abundance for major spawning stocks in Southeast Alaska. Age Structured Analysis (ASA), which relies on a time series of herring population assessment data, was used to forecast herring biomass for those stocks with adequate historical data (Revillagiedo Channel, Craig, Sitka, Tenakee Inlet and Seymour Canal). ASA uses estimates of recruitment, age, growth, maturation, natural mortality, weight-at-age, and spawning escapement to forecast herring stock abundance. Age and growth information is obtained by samples collected from test fishing, commercial harvests, mid-water trawling (department survey), and sampling on the spawning grounds by the department. Forecasts for herring stocks other than the four ASA areas are currently computed using a biomass accounting method where the observed spawning biomass and age composition from one year is modified by estimates of growth and mortality to produce a subsequent year's biomass forecast.

In the future, ASA-based forecasts may be applied to other areas as the time series of data for those areas becomes sufficiently long. The department plans to use this tool in additional areas where there is regular, annual collection of relevant age composition and abundance data. The ASA method is also used to forecast spawning biomass of herring in South-central Alaska, the Eastern Bering Sea, and British Columbia. Different forms of ASA models are also integral parts of the stock assessments for most groundfish stocks in the Bering Sea and the Gulf of Alaska.

2001–2002 SEASON SUMMARY

The 2001–2002 season herring catch totaled approximately 13,658 tons of herring and herring equivalents (for spawn on kelp fisheries where mature herring are not harvested; Table 1). The catch included over 337 tons of winter bait herring, 10,854 tons of sac roe herring, 311 tons of herring caught in test fisheries, and 171.9 tons of spawn on kelp (2,149 tons of herring equivalent). The exvessel value was approximately \$2,113,8012 for spawn on kelp, and \$112,128 in the herring test fisheries. No exvessel value estimates are available for sac roe herring and bait herring.

Five sac roe herring fishing areas are established by regulation. They include two exclusive purse seine areas (Sitka Sound and Lynn Canal) and two exclusive set gillnet areas (Kah Shakes/Cat Island and Seymour Canal). Regulations for the Hobart Bay/Port Houghton area provide for a herring gillnet fishery if the winter bait fishery does not harvest the entire guideline harvest level (Figure 4). Both gear types are under a limited entry system. The sac roe fisheries opened in the Sitka Sound and Seymour Canal areas in spring 2002. During the 1998–1999 season, in the Kah Shakes/Cat Island area, the total return of herring was much less than forecast and despite the fact that a guideline harvest level of 870 tons of herring was set

2 Due to often considerable after market adjustments, herring exvessel value estimates may be of limited value until processor reporting occurs the following year. Exvessel values reported here are only reported when local managers estimate they have a good value approximation. These values, when presented, should be considered preliminary.

for this area, the fishery did not open. The Kah Shakes/Cat Island area has since remained below threshold. Lynn Canal remained below threshold level and did not open in 2002. For the 2001–2002 season, 62 gillnet permits and 51 purse seine permits were issued.

Spawn-on-kelp fisheries were conducted in Craig and Hoonah Sound during 2002. The winter bait fishery was opened in Craig and Tenakee Inlet. All other areas remained below required threshold levels.

No commercial herring fisheries occur in West Behm Canal. The biomass was very small for this area in the 1970s through the early 1990s. Since 1992–1993 the spawning biomass has increased substantially. Currently the established threshold is set at 2,000 tons for West Behm Canal. This threshold was established prior to the relatively recent increase in biomass and during the January 2000 Board of Fisheries meeting the department reported that the current threshold was probably inappropriately low. A data review is in progress to determine the appropriate threshold for West Behm Canal. In the 1970s both bait and sac roe were taken in West Behm Canal by purse seiners and the gillnet fleet. During the January 2000 Board of Fisheries meeting the herring committee recommended opposing, and the Board voted against, creating commercial herring fisheries in West Behm Canal. Only a limited test fishery harvest has occurred in West Behm Canal during recent years.

2001–2002 Winter Food and Bait Fishery

Winter herring fishing for food and bait is allowed by regulation in Districts and/or Sections 1–10, 11-B, 11-C, 12, 13-A, 13-B (only south of the latitude of Aspid Cape), 14, 15-A, and 16 in the Southeast Alaska area. In the Yakutat area, Yakutat Bay is closed to herring fishing. The fishing season is set by regulation from October 1 through February 28 in both areas. In the Southeast Alaska area, regulations specify that open fishing periods be established by emergency order. Although the existing regulations specify purse seines and set gillnets as legal allowable gear, only purse seine gear has been fished in recent years.

Two stocks were identified as having harvestable quantities of bait herring during the 2001–2002 winter season (Figure 3): the Craig/Klawock area with a GHF of 571 tons and the Tenakee Inlet fishery with a GHF of 840 tons. Both fisheries were opened to the commercial harvest of herring December 3, 2001 and closed by regulation February 28, 2002. Only a limited amount of the Craig/Klawock GHF was harvested during the season (actual numbers are confidential with less than three permits participating). In Tenakee Inlet three boats harvested a total of 327 tons (Table 4).

The forecast was less than threshold for other Southeast fisheries and no other winter-bait fisheries occurred during the 2001–2002 season (Table 4).

2001–2002 Test Fishery

Three test fisheries to harvest sac roe herring were conducted in Southeast Alaska during the 2001–2002 season: Sitka Sound, West Behm Canal, and Seymour Canal. The funds generated were used to obtain data

on age structure, spawn timing, and abundance of herring spawning populations. Revenues were also used to defray costs for managing and assessing herring populations in other areas of Southeast Alaska.

2001–2002 Sac Roe Fishery

A harvest of 10,854 tons of sac roe herring was taken in sac roe fisheries during the 2001–2002 season. This harvest resulted from a Sitka Sound purse-seine catch of 9,788 tons and a Seymour Canal gillnet catch of 1,066 tons (Table 5). Abundance forecasts were below minimum population threshold levels in Lynn Canal, Kah Shakes/Cat Island, and Hobart Bay/Port Houghton and no fisheries were allowed in these areas during the 2001–2002 season.

In Sitka, a 20% harvest rate was applied to the 2002 spawning biomass forecast of 55,209 tons for a quota of 11,042 tons. The Sitka sac roe fishery went on two-hour notice beginning March 24, 2002. Most of the GHL, 86%, was taken during four competitive openings on March 27, 29, 31, and April 2, 2002. The remaining 14% was taken during a cooperative style fishery beginning 12:30 p.m., April 12. The cooperative fishery was open daily 0600 to 1800 until it was closed April 15, 2002. All 51 permit holders and nine buying companies participated in the 2002 fishery. Herring spawning occurred from March 24 through April 3 with minor additional spawning April 9 through April 14, 2002. Fishers harvested approximately 72.7 tons of herring in excess of the agreed amount for the cooperative fishery. The value of those fish was returned to the Department of Fish and Game's test fish program.

The ASA forecast of the mature spawning biomass for the Seymour Canal herring spawning stock was 8,155 tons. The sliding scale harvest rate allowed a 13.4% harvest rate for this biomass and a GHL of 1,096 tons for the 2001–2002 season. The fishery went on 12-hour notice April 29, 2001. The fishery opened 8:00 p.m. May 16 and closed 1:30 p.m. May 17, 2002 for a total of 18.5 hours of fishing time, including the one-hour grace period. Approximately 1,066 tons were taken by a total of 62 boats and 3 processors participated in the Seymour Canal fishery.

2001–2002 Herring Pound Fisheries

There are three types of herring pound fisheries in Southeast Alaska: tray pack bait, fresh bait, and spawn on kelp. The tray pack pound fishery was created in 1979 when the Board of Fisheries allocated a harvest of up to 100 tons. Only limited harvests occurred in the early 1980s. In recent years there has been very little participation.

Fresh bait pounds are allowed by regulation under a permit system in five areas: Tee Harbor, Indian Cove, Scow Bay, Sitka Sound (Section 13-B), and Lisianski Inlet (Figure 5). Current regulations specify annual harvest quotas of 100 tons each for Scow Bay, and Sitka Sound, 60 tons each for Tee Harbor and Indian Cove, and 25 tons for Lisianski Inlet. Three fresh bait pounds were operated in Sitka during the 2001–2002 season with an estimated combined harvest of 6.8 tons (Table 6).

There are two closed pound spawn-on-kelp fisheries in Southeast Alaska: Craig/Klawock and Hoonah Sound (Figure 7). The spawn-on-kelp fishery for the Craig/Klawock area was initiated in the spring of 1992. The harvest limit of herring is shared with the bait fishery with 40% of the total guideline harvest allocated to the spawn-on-kelp fishery and 60% allocated to the bait fishery. The 40:60% allocation split was new as of the 1997–1998 season due to Board of Fisheries action (at the January 1997 meeting) which changed the previous allocation of 15% for spawn-on-kelp and 85% for bait. For the 2001–2002 season, the original herring allocation was 381 tons but that was increased by 471 tons, which was the amount remaining on the bait fishery allocation, resulting in a total guideline harvest level of 852 tons. The pounding area was opened to purse seining for herring for introduction into closed pounds from 5:00 a.m. to 5:00 p.m. daily starting 12:00 noon, March 17, 2002. Fishing time was expanded from 4:00 a.m. to 9:00 p.m. daily, effective 5:00 p.m. Tuesday, April 2, 2002. There were a total of fifty active pounds on the grounds during the 2001–2002 season with 89 permit holders landing product from 40 multiple closed pounds and 9 single closed pounds. Preliminary product exvessel value is \$113,977. All pounds and pound structures were required to be removed from the water by May 31, 2002 (Table 7).

For the Hoonah Sound spawn-on-kelp fishery 2001–2002 season, the guideline harvest level was 1,264 tons of herring. The pounding area was open to purse seining for herring for introduction into closed pounds from April 6 through April 30, 2002. There were 108 herring pounds on the fishing grounds from which 98 permit holders sold spawn-on-kelp product. A total of 136.6 tons of product were harvested during the fishery. Preliminary product exvessel value is \$1,999,824 (Table 7). All pounds and pound structures were required to be removed from the water by June 10, 2002.

Herring Spawn-on-Kelp Subsistence Fishery

The harvest of "wild" herring spawn on kelp has occurred traditionally throughout the region. The Southeast Alaska fishery is regulated solely through the issuance of subsistence spawn-on-kelp permits at local Fish and Game offices, while no permit is required for the Yakutat area. The permits specify times, areas, and amounts of spawn on kelp allowed. The annual possession limit for herring spawn-on-kelp is 32 pounds for individuals or 158 pounds for a household of two or more persons. Additional permits for herring spawn-on-kelp above the annual possession limit is allowed, at the department's discretion.

Subsistence spawn-on-kelp harvests occur in March and April near Craig, Hydaburg, and Sitka where major herring spawning populations are found (Figure 6). *Macrocystis* kelp is the preferred species of kelp. In 2002, based on department permits, an estimated combined total of 11,422 pounds (Table 8) of spawn-on-kelp was harvested in these areas. Based on the results of a 2002 survey conducted by the department's Subsistence Division in Sitka, an estimated total of 151,717 pounds of herring roe and spawn, on all strata, were harvested. This includes an estimated total of 139,755 pounds of herring roe on hemlock branches.

HISTORICAL VALUE

Exvessel value data was downloaded³ from the Commercial Fisheries Entry Commission's (CFEC) web site at <http://www.cfec.state.ak.us/bit/mnuherr.htm> for 1977 through 2001. Data for 2002 is not expected to be available until late 2003. Questions, definitions, and additional information concerning exvessel value may be directed to the above web site and CFEC, and is reproduced here for convenience (Table 9). Please note that CFEC data is collected and recorded on an annual basis. Consequently, winter bait fisheries values do not reflect the seasonal but the annual values of a fishery.

As per CFEC data, from 1990 through 2001, commercial exvessel values have ranged from a low of \$1,971,960 in 1991 to a high of \$16,014,211 in 1996. During this period approximately 50–75% of the total value occurs in the seine sac roe fishery.

2002–2003 SEASON OUTLOOK

There are two herring stocks subject to the bait fishery that have biomass forecasts above threshold. They are Tenakee Inlet (528 tons) and Craig/Klawock (378 tons). The Tenakee Inlet stock has decreased after three seasons (1996/1997 – 1998/1999) at a high abundance level, but remains above threshold. The Craig/Klawock stock remains at a fairly low, though steady, level. Although this forecast is near the recent average, it is far less than estimated abundances during several strong years in the late 1980s and early 1990s. There was very little spawn in Ernest Sound in 2002 and the 2002–2003 biomass forecast is below threshold. The West Behm Canal biomass forecast (6,742 tons) is slightly higher than the last two seasons but is still less than what was seen during the late 1990s.

Spawn-on-kelp-fisheries will occur in Hoonah Sound and the Craig/Klawock area. The Kah Shakes/Cat Island fishery forecast has been below threshold for several years and there will be no sac roe fishery in 2003. The Sitka Sound stock is expected to remain at a healthy level (the preliminary 2003 forecast is 42,457 tons) and a commercial fishery is expected there in 2003. The Seymour Canal spawning stock has been above threshold for the last several years. The 2003 forecast is 11,113 tons and a commercial fishery is expected with a quota of 1,712 tons. The Lynn Canal stock is forecast to be below threshold and no fisheries will be allowed.

³ Data downloaded October 29, 2002.

Table 1. Southeast Alaska Herring harvests in tons, 1900-2001 to 2001–2002.^{a, b}

Season ^c	Total Catch	Season	Total Catch	Season	Total Catch
1900-01	1,194	1935-36	58,155	1970-71	5,015
1901-02	1,250	1936-37	36,713	1971-72	3,867
1902-03	812	1937-38	50,334	1972-73	6,307
1903-04	1,494	1938-39	22,356	1973-74	7,837
1904-05	1,521	1939-40	20,028	1974-75	7,985
1905-06	1,309	1940-41	3,137	1975-76	7,942
1906-07	1,005	1941-42	6,230	1976-77	8,640
1907-08	1,382	1942-43	3,691	1977-78	6,071
1908-09	1,711	1943-44	6,235	1978-79	6,532
1909-10	1,075	1944-45	16,801	1979-80	9,217
1910-11	6,867	1945-46	24,126	1980-81	8,393
1911-12	12,057	1946-47	37,564	1981-82	8,723
1912-13	16,067	1947-48	41,829	1982-83	9,903
1913-14	13,496	1948-49	16,125	1983-84	9,081
1914-15	8,318	1949-50	14,279	1984-85	11,104
1915-16	6,964	1950-51	13,411	1985-86	9,792
1916-17	11,194	1951-52	10,652	1986-87	8,369
1917-18	12,445	1952-53	16,020	1987-88	16,152
1918-19	17,825	1953-54	12,435	1988-89	16,156
1919-20	10,962	1954-55	6,446	1989-90	8,056
1920-21	16,452	1955-56	11,368	1990-91	5,882
1921-22	6,012	1956-57	22,819	1991-92	9,415
1922-23	16,950	1957-58	24,745	1992-93	12,096
1923-24	21,240	1958-59	38,797	1993-94	6,948
1924-25	29,395	1959-60	49,866	1994-95	4,478
1925-26	57,782	1960-61	38,906	1995-96	9,425
1926-27	73,843	1961-62	24,709	1996-97	14,742
1927-28	45,310	1962-63	16,959	1997-98	10,590
1928-29	53,007	1963-64	15,703	1998-99	12,903
1929-30	78,749	1964-65	23,553	1999-2000	6,451
1930-31	70,855	1965-66	12,390	2000-01	14,706
1931-32	44,857	1966-67	5,670	2001-02	13,658
1932-33	49,786	1967-68	3,214		
1933-34	61,588	1968-69	1,852		
1934-35	66,842	1969-70	2,644		

^a Harvests include the fresh bait pound harvest and test fishery harvests.

^b Spawn-on-kelp fishery harvests converted to herring equivalents at 12.5 to 1 ratio.

^c Season includes total harvest from fall through spring. Example: October 1976–May 1977.

Table 2. Southeast Alaska region annual herring catch in tons by fishery type, 1960–1961 through 2001–2002 seasons.

Year	Reduction	Winter Bait	Spawn on Kelp ^a	Sac Roe	Test Fishery	Bait Pound	Total ^b
1960-61	36,790	2,116					38,906
1961-62	22,869	1,840					24,709
1962-63	13,765	3,172	22				16,959
1963-64	13,539	2,064	100				15,703
1964-65	21,397	1,957	199				23,553
1965-66	10,062	2,094	234				12,390
1966-67	2,918	2,422	330				5,670
1967-68		3,025	189				3,214
1968-69		1,816	36				1,852
1969-70		2,644					2,644
1970-71		3,324		1,691			5,015
1971-72		2,045		1,822			3,867
1972-73		3,954		2,353			6,307
1973-74		5,856		1,981			7,837
1974-75		5,910		2,075			7,985
1975-76		5,688		2,254			7,942
1976-77		6,409		2,231			8,640
1977-78		4,042		2,029			6,071
1978-79		3,485		3,047			6,532
1979-80		2,717		6,500			9,217
1980-81		1,671		6,722			8,393
1981-82		1,530		7,193			8,723
1982-83		1,169		8,713		21	9,903
1983-84		620		8,411		50	9,081
1984-85		1,431		9,636		37	11,104
1985-86		2,442		7,319		31	9,792
1986-87		2,347		5,957		65	8,369
1987-88		4,016		11,246		17	15,279
1988-89		3,116		12,970		66	16,152
1989-90		3,843	12.0	4,163		38	8,056
1990-91		3,273	13.3	2,514		81	5,882
1991-92		2,719	48.8	6,614		32.3	9,415
1992-93		1,052	19.7	10,955		*	12,096
1993-94		879	49.2	5,884	136	0	6,948
1994-95		464	54.4	3,850	109.8	0	4,478
1995-96		484	37.3	8,749	154.5	0	9,425
1996-97		739	88.0	12,726	176	0	13,729
1997-98		840	108.4	8,233	162	0	9,343
1998-99		1,033	108.0	10,348	172	0	11,661
1999-2000		926	36	4,966	109	*	6,037
2000-01		775	92.2	12,654	124	0	13,645
2001-02		337	171.9	10,854	311	6.8	11,681

^a A spawn-on-kelp pound fishery was implemented in the spring of 1990; prior harvests were from the “wild” spawn-on-kelp fishery.

^b Includes spawn-on-kelp product, not total herring impacted in pound fisheries.

* When number of permits is less than three, information is considered confidential.

Table 3. Herring spawning threshold levels for major herring stocks in Southeast Alaska and Yakutat.

Area	Threshold Level (tons)
Hoonah Sound	1,000
Yakutat Bay	1,000
Ernest Sound	2,500
Anita Bay	2,500
Port Camden	2,500
Hobart Bay/Port Houghton	2,000
Lisianski Inlet	2,500
Seymour Canal	3,000
Tenakee Inlet	3,000
Tongass Narrows and George and Carroll Inlets	3,500
Mearns Passage/Bocas de Finas	5,000
Kah Shakes and Cat Island	6,000
Lynn Canal	5,000
Sitka Sound	20,000
Other stocks not included above	2,000

Table 4. Southeast Alaska winter food and bait herring harvest in tons, by fishing area and season, 1982–1983 through 2001–2002.^a

Year	Craig	Anita Bay	Earnest Sound	Hobart Bay/Houghton	Port Camden	Tenakee Inlet	Lisianski	Whale/Necker Bay	Scow Bay	Slocum Arm	Total
1982-83	140	124	0	0	0	768	0	0	17	0	1,049
1983-84	0	0	0	0	42	619	0	0	0	0	661
1984-85	0	0	0	0	0	1,431	0	0	0	0	1,431
1985-86	302	0	0	0	0	2,040	0	0	0	0	2,342
1986-87	1,231	0	0	0	0	1,275	0	0	0	0	2,506
1987-88	2,014	0	0	0	0	1,577	280	0	0	257	4,128
1988-89	1,730	0	0	0	0	690	770	0	0	0	3,190
1989-90	3,221	0	0	0	0	595	27	0	0	0	3,843
1990-91	3,272	0	0	0	0	0	0	0	0	0	3,272
1991-92	2,295	0	0	0	0	0	353	0	0	0	2,648
1992-93	629	0	8	0	0	0	239	176	0	0	1,052
1993-94	636	0	0	140	0	0	0	103	0	0	879
1994-95	124	0	111	229	0	0	0	0	0	0	464
1995-96	34	0	220	230	0	0	0	0	0	0	264
1996-97	525	0	6	110	0	98	0	0	0	0	739
1997-98	254	0	0	0	0	586	0	0	0	0	840
1998-99	102	0	96	0	0	835	0	0	0	0	1,033
1999-2000	*	0	0	432	0	494	0	0	0	0	926
2000-01	*	0	0	0	0	775	0	0	0	0	775
2001-02	*	0	0	0	0	337	0	0	0	0	337

^a The 1995–1996 season reflects harvests occurring in the fall of 1995 and the spring of 1996.

* Data considered confidential with fewer than three participants.

Table 5. Annual Southeast Alaska sac roe herring harvest by area, in tons, 1971 to 2002.

Year	Sitka Sound	Lynn Canal	Seymour Canal	Revillagiged o Channel	Other Areas	All Areas
1971	748	688	35	0	220 ^a	1,691
1972	602	524	495	0	201 ^b	1,822
1973	597	798	506	0	452 ^c	2,353
1974	681	396	904	0	0	1,981
1975	1,517	558	0	0	0	2,075
1976	800	630	195	426	203 ^d	2,254
1977	0	926	485	820	0	2,231
1978	175	954	729	171	0	2,029
1978	2,250	0	269	528	0	3,047
1980	4,385	975	0	1,140	0	6,500
1981	3,506	761	615	1,840	0	6,722
1982	4,363	551	0	2,279	0	7,193
1983	5,463	0	0	3,250	0	8,713
1984	5,711	0	518	2,182	0	8,411
1985	7,475	0	0	2,161	0	9,636
1986	5,443	0	339	1,537	0	7,319
1987	4,216	0	302	1,439	0	5,957
1988	9,573	0	586	1,087	0	11,246
1989	11,831	0	547	592	0	12,970
1990	3,804	0	359	0	0	4,163
1991	1,838	0	0	660	0	2,514
1992	5,368	0	0	1,246	0	6,614
1993	10,216	0	0	737	0	10,953
1994	4,753	0	382	749	0	5,884
1995	2,908	0	319	626	0	3,853
1996	8,144	0	0	605	0	8,749
1997	11,147	0	0	1,137	442 ^e	12,726
1998	6,680	0	586	616	351 ^e	8,233
1999	9,136	0	706	0	506 ^e	10,348
2000	4,617	0	389	0	0	4,966
2001	11,972	0	620	0	0	12,654
2002	9,788	0	1,066	0	0	10,854

^a Washington Bay (76 tons), Lisianski Inlet (100 tons).

^b Lisianski Inlet.

^c Yakutat Bay (158 tons), Helm Bay (194 tons), and Lisianski Inlet (100 tons).

^d Helm Bay (26 tons), Chaik Bay (40 tons), Pybus Bay (22 tons), Gambier Bay (8 tons), and Kasaan Bay (107 tons).

^e Hobart Bay/Port Houghton commercial sac roe gillnet fishery harvest, not including test fishery harvest.

Table 6. Fresh herring bait pound harvests in tons by area, 1983–2002.

Year	Scow Bay	Farragut Bay	Sitka Sound	Tee Harbor	Indian Cove	Lisianski Inlet	Total Harvest
1983	7	14	0 ^a	0	0	0	21
1984	3	12	35	0	0	0	50
1985	4	0	33	0	0	0	37
1986	0	5	26	0	0	0	31
1987	0	3	62	0	0	0	65
1988	0	0	17	0	0	0	17
1989	0	0	66	0	0	0 ^a	66
1990	0	0	38	0	0	0	38
1991	0	16	65	0	0	0	81
1992	0	15	17	0	0	0	32
1993	0	0	*	0	0	0	*
1994	0	0	*	0	0	0	*
1995	0	0	0	0	0	0	0
1996	0	0	0	0	0	0	0
1997	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0
1999	0	0	0	0	0	0	0
2000	0	0	*	0	0	0	*
2001	0	0	0	0	0	0	0
2002	0	0	6.8	0	0	0	6.8

^a Pounds were allowed by regulation in Sitka Sound in 1983 and in Lisianski Inlet in 1989.

* When number of permits are less than three, information is confidential.

Table 7. Herring spawn-on-kelp fishery summary, 1990–2002.

CRAIG/KLAWOCK HERRING POUND FISHERY						
	1992	1993	1994	1995	1996	1997
Herring Quota (tons)	403	240	135	109	100	100
Harvest Quota (tons)	32.2	19.2	10.8	8.7	8.0	8.0
Fishery Exvessel value	\$180,000	\$47,882	\$364,199	\$1,000,000	\$1,490,141	\$270,306
Total Harvest (tons)	25.7	5.7	16.5	25.36	37.25	23.0
Average Price/pound	\$3.50	\$4.17	\$11.00	\$19.00	\$20.00	\$6.00
Average Income	\$784.70	\$2,081	\$4,388	\$5,107	\$9,676	\$1,890
Number of Applicants	531	389	257	241	195	218
Number of Pounds	248	209	147	159	162	119
Number of Landings	229	23	83	146	154	143
Herring Allocation (tons)	1.6	1.15	1.1	0.7	0.6	0.7
Blade Quota (tons)	8	6.4	3.75	2.9	2.67	2.6
Blade Allocation	310	292	233	174	157	^a
Total Kelp Harvest (tons)	7.8	3.7	2.9	3	2.6	3.2
Herring Spawn Dates	3/15-4/10	3/26-4/21	3/23-4/12	3/27-4/9	3/22-4/12	4/7-4/14
Miles of Herring Spawn	22.6	8.4	8.0	5.5	9.9	9.9
Spawning Biomass (tons)	8,441	7,467	7,996	6,778	6,262	6,755
Seining Opened - Closed	3/18-3/23	4/17-4/28	4/5-4/18	3/28-4/14	3/21-4/11	3/17-4/20

CRAIG/KLAWOCK HERRING POUND FISHERY					
	1998	1999	2000	2001	2002
Herring Quota (tons)	501	650	280	913.5	852
Harvest Quota (tons)	40.0	52.0	22.4	N/A	N/A
Fishery Exvessel value	\$152,203	\$212,121	0	\$146,859	\$113,977
Total Harvest (tons)	22.4	36.0	0.0	27.2	35.3
Average Price/pound	\$3.39	\$2.94	0	\$2.70	\$1.61
Average Income	\$1,072	\$2,060	0	\$2,880	\$1,281
Number of Applicants	170	161	164	N/A	89
Number of Pounds	112	70	50	31	49
Number of Landings	148	103	0	51	
Herring Allocation (tons)	4.46	N/A	N/A	N/A	N/A
Blade Quota (tons)	13	9.1	7.4	N/A	N/A
Blade Allocation	^b	^c	^d	^e	^f
Total Kelp Harvest (tons)	3.5	2.9	2.0	3.2	5.1
Herring Spawn Dates	3/19-4/8	3/23-3/28	3/22-4/5	4/1-4/7	3/31-4/7
Miles of Herring Spawn	13.2	15.0	12.9	16.7	18.0
Stock Biomass (tons)	7,018	6,951	6,013	9,591	9,116
Seining Opened - Closed	3/17-4/10	3/17-4/21	3/17-5/1	3/17-4/24	3/17-5/20

^a 100 blades for single-closed pound, 150 blades for multiple-pound permit holder, and 300 blades for open-pound permits.

^b 120 blades for single-closed pound, 180 blades for multiple-pound permit holder, 360 blades for single open-pound permits, and 400 blades for multiple-permit open pound.

^c 155 blades for single-closed pound, 235 blades for multiple-pound permit holder, 470 blades for single open-pound permits, and 520 blades for multiple-permit open pound.

^d 70 blades for single-closed pound, 210 blades for multiple-permit closed pounds, 700 blades for single open pound, 2,100 blades for multiple-permit open pound.

^e 200 blades for single-closed pound, 600 blades per permit holder for multiple-permit closed pounds, 200 fronds or 2,000 blades for single open-pound permits, and 600 fronds or 6,000 blades for multiple-permit open pound.

^f 200 blades for single-closed pounds, 600 blades for multiple-permit closed pounds, 200 fronds or 2,000 blades for single-open pounds, and 600 fronds or 6,000 blades for multiple-open pounds.

-continued-

Table 7. (page 2 of 2)

HOONAH SOUND HERRING POUND FISHERY							
	1990	1991	1992	1993	1994	1995	1996
Herring Quota (tons)	150	150	150	150	150	150	0
Harvest Quota (tons)	11	12	12	12	12	12	0
Fishery Exvessel value	\$164,083	\$206,401	\$322,343	\$344,907	\$1,224,631	\$1,300,000	\$0
Total Harvest (tons)	11.9	13.25	23.12	14	32.7	29	0
Average Price/pound	\$6.90	\$7.79	\$6.96	\$12.33	\$18.73	\$22.40	
Average Income	\$1,657	\$2,487	\$2,985	\$5,385	\$11,133	\$10,400	\$
Number of Applicants	400	185	199	230	195	153	
Number of Pounds	128	104	120	115	123	128	
Number Selling Product	99	83	108	64	109	125	
Herring Allocation (tons)	1.17	1.44	1.25	1.30	1.22	1.17	
Blade Allocation	240	280	240	160	140	100	
Herring Spawn Dates	4/13-4/28	4/19-4/24	4/22-4/24	4/27-4/29	4/21-4/24	4/20-4/24	5/3-5/6
Miles of Herring Spawn	10	8.7	10.8	5.8	9.0	4.5	10.0
Spawning Biomass (tons)	2,350	2,175	5,714	1,099	2,450	274	4,023
Seining Opened - Closed	4/13-4/22	4/6-4/25	4/6-4/26	4/6-5/3	4/6-4/25	4/6-4/22	

HOONAH SOUND HERRING POUND FISHERY						
	1997	1998	1999	2000	2001	2002
Herring Quota (tons)	1,420	703	778	359	366	1,264
Harvest Quota (tons)	113.6	56.2	62	29	N/A	N/A
Fishery Exvessel value	\$920,000	\$1,160,523	\$1,005,529	\$587,568	\$1,006,000	\$1,999,824
Total Harvest (tons)	65	86	71.6	35.7	66.2	136.6
Average Price/pound	\$7.05	\$6.75	\$7.02	\$8.23	\$7.60	\$7.32
Average Income	\$6,694	\$10,092	\$11,692	\$6,251	\$11,559	\$20,406
Number of Applicants	139	133	106	106	N/A	N/A
Number of Pounds	113 / 18 ^a	115	96	46/2/0 ^b	42/3/1 ^b	108
Number Selling Product	112 / 12 ^a	115	86	84	87	98
Number of Kelp Permits	34	31	22	17	16	
Blade Allocation ^a	430 / 860 ^a	400 / 800 ^a	400 / 800 ^a	^c	^d	^e
Herring Spawn Dates	4/24-4/28	4/23-4/26		4/27-4/29	4/27-5/7	-4/27
Miles of Herring Spawn	14.5	14.5	13.8	13.0	13.7	11.4
Spawning Biomass (tons)	5,964	6,472	4,572	3,635	7,946	6,320
Seining Opened - Closed	4/6-4/29	4/6-4/27	4/6-5/3	4/6-5/3	4/6-5/3	4/6-4/30

^a Closed pound/Open pound.

^b Double closed pounds/single closed pounds/open pounds.

^c 120 blades for single-permit closed pound, 300 blades per multiple-permit closed pound, 1,100 blades per single open pound, and 1,100 blades per multiple-permit open pound.

^d 120 blades for single-permit closed pounds, 300 blades for double-permit closed pounds, 1,100 blades or 110 fronds for single-permit open pounds.

^e As per 5 AAC 27.185: 1,000 blades for single-permit closed pound, 1,000 blades (per permit holder) for multiple-permit closed pounds, 3,600 blades or 360 fronds per single open-pound permits, and 3,600 blades or 360 fronds for multiple-permit open pounds.

Table 8. Herring spawn-on-kelp subsistence harvests, 1967 to 2002.

Year	CRAIG/KLAWOCK/HYDABURG			SITKA			KAH SHAKES		
	Permits Issued	Permits Returned	Total Pounds Harvested*	Permits Issued	Permits Returned	Total Pounds Harvested*	Permits Issued	Permits Returned	Total Pounds Harvested*
1967	201	130	3,368						
1968	130	95	2,260						
1969	80	61	2,858						
1966	145	86	5,200						
1970	103	60	3,213						
1971	81	66	2,643						
1972	102	44	4,250						
1973	31	9	1,209						
1974	159	39	3,087						
1975	92	34	1,640						
1976	54	12	1,728						
1977	34	7	352						
1978	109	83	3,521				11	8	122
1979	102	81	1,268	21	10	137	16	6	0
1980	309	189	3,721	19	13	145	33	24	75
1981	157	87	6,148	26	19	192	6	5	12
1982	187	81	5,485	36	25	886	30	18	342
1983	302	189	5,945	69	48	1,991	33	24	103
1984	261	159	4,972	50	40	1,281	14	6	116
1985	233	168	9,553	71	45	3,963	19	10	0
1986	241	142	5,565	90	82	3,929	5	2	0
1987	263	158	15,038	97	59	8,827	5	4	0
1988	191	124	6,354	127	77	6,146	6	6	68
1989	221	117	11,699	70	53	962	10	9	0
1990	245	172	10,158	71	63	4,022	7	0	0
1991	274	142	12,627	75	61	5,925	4	4	60
1992	407	304	16,677	118	83	7,484	8	7	75
1993	290	167	5,592	61	47	4,108	8	3	0
1994	293	161	5,376	81	62	2,778	9	6	0
1995	201	80	3,446	58	37	2,748	3	1	0
1996	261	164	11,443	97	70	6,057	4	3	0
1997	226	166	8,247	87	60	4,837	0	0	0
1998	213	88	5,670	60	42	3,079	0	0	0
1999	185	120	6,420	58	39	3,315	1	1	40
2000	116	77	820	47	46	2,790	0	0	0
2001	118	50	7,054	52	46	1,177	0	0	0
2002	111	35	7,164	47	41	4,258	1	0	0

*The total harvest was extrapolated from harvests reported on returned permits to include an estimate of unreported harvests.

Table 9. Southeast Alaska commercial herring fisheries exvessel value, 1977–2001. The 2002 data is not expected to be available until late 2003. Data downloaded October 29, 2002, from CFEC web site at <http://www.CFEC.state.ak.us/bit/mnuherr.htm>.

Year	Bait herring Gross Earnings			Seine Sac Roe Gross Earnings			Gillnet Sac Roe Gross Earnings			SOK Gross Earnings			Combined Total			
	Total	% Total	Average	Total	% Total	Average	Total	% Total	Average	Total	% Total	Average				
1977	\$506,510 (42%) \$31,657			\$694,641 (58%) \$28,943									\$1,201,151			
1978				\$1,421,682 (100%) \$43,081									\$1,421,682			
1979				\$9,051,787 (100%) \$188,579									\$9,051,787			
1980				\$2,132,181 (87%) \$42,644			\$312,422 (13%) \$2,893						\$2,444,603			
1981	\$342,855 (9%)		\$16,326	\$2,375,768 (60%) \$60,917			\$1,246,133 (31%) \$10,560						\$3,964,756			
1982	\$557,947 (20%)		\$27,897	\$1,662,806 (59%) \$33,256			\$602,012 (21%) \$5,235						\$2,822,765			
1983	\$166,352 (2%)		\$27,725	\$5,032,197 (62%) \$104,837			\$2,948,779 (36%) \$23,974						\$8,147,328			
1984	\$127,544 (2%)		\$15,943	\$3,728,712 (60%) \$74,574			\$2,327,431 (38%) \$17,499						\$6,183,687			
1985	\$320,575 (3%)		\$20,036	\$7,882,532 (69%) \$151,587			\$3,186,307 (28%) \$26,553						\$11,389,414			
1986	\$547,902 (5%)		\$27,395	\$7,412,678 (70%) \$148,254			\$2,636,465 (25%) \$22,534						\$10,597,045			
1987	\$586,407 (8%)		\$24,434	\$4,396,233 (58%) \$84,543			\$2,546,524 (34%) \$21,765						\$7,529,164			
1988	\$1,009,959 (12%)		\$29,705	\$4,169,182 (50%) \$81,749			\$3,107,909 (38%) \$26,117						\$8,287,050			
1989	\$899,715 (26%)		\$29,991	\$1,181,649 (34%) \$23,170			\$1,379,359 (40%) \$12,772						\$3,460,723			
1990	\$1,029,862 (30%)		\$39,610	\$1,950,240 (57%) \$39,005			\$260,076 (8%) \$3,715			\$198,657 (6%)		\$2,007	\$3,438,835			
1991	\$916,312 (46%)		\$33,937	\$205,878 (10%) \$9,358			\$623,623 (32%) \$7,424			\$226,147 (11%)		\$2,725	\$1,971,960			
1992	\$719,984 (16%)		\$23,999	\$1,373,195 (31%) \$28,608			\$1,777,225 (40%) \$15,728			\$529,294 (12%)		\$1,770	\$4,399,698			
1993	\$471,231 (8%)		\$29,452	\$3,483,769 (61%) \$69,675			\$1,299,931 (23%) \$12,744			\$416,850 (7%)		\$5,084	\$5,671,781			
1994	\$125,030 (2%)		\$25,006	\$3,625,530 (49%) \$72,511			\$1,767,883 (24%) \$14,982			\$1,836,695 (25%)		\$11,131	\$7,355,138			
1995	\$146,721 (2%)		\$20,960	\$3,932,868 (53%) \$103,497			\$1,863,868 (25%) \$16,494			\$1,476,467 (20%)		\$11,907	\$7,419,924			
1996				\$14,349,558 (90%) \$281,364			\$1,664,653 (10%) \$13,757						\$16,014,211			
1997	\$175,370 (3%)		\$29,228	\$4,726,487 (68%) \$94,530			\$984,762 (14%) \$8,489			\$1,082,340 (16%)		\$8,659	\$6,968,959			
1998	\$546,127 (14%)		\$54,613	\$1,646,221 (43%) \$33,596			\$613,016 (16%) \$7,046			\$1,047,324 (27%)		\$9,107	\$3,852,688			
1999	\$345,292 (5%)		\$38,366	\$4,906,058 (73%) \$96,197			\$569,508 (8%) \$6,399			\$932,727 (14%)		\$10,846	\$6,753,585			
2000	\$235,875 (6%)		\$39,313	\$2,633,510 (71%) \$53,745			\$225,552 (6%) \$5,126			\$596,238 (16%)		\$7,098	\$3,691,175			
2001	\$124,804 (2%)		\$31,201	\$4,405,690 (77%) \$93,738			\$186,026 (3%) \$3,445			\$978,067 (17%)		\$11,242	\$5,694,587			
90-01 Avg.	\$439,692		\$33,244	\$3,936,584			\$81,319			\$986,344			\$9,612	\$847,346	\$7,416	\$6,102,712
Avg.	\$471,542		\$29,371	\$3,935,242			\$81,678			\$1,460,430			\$12,966	\$847,346	\$7,416	\$5,989,348

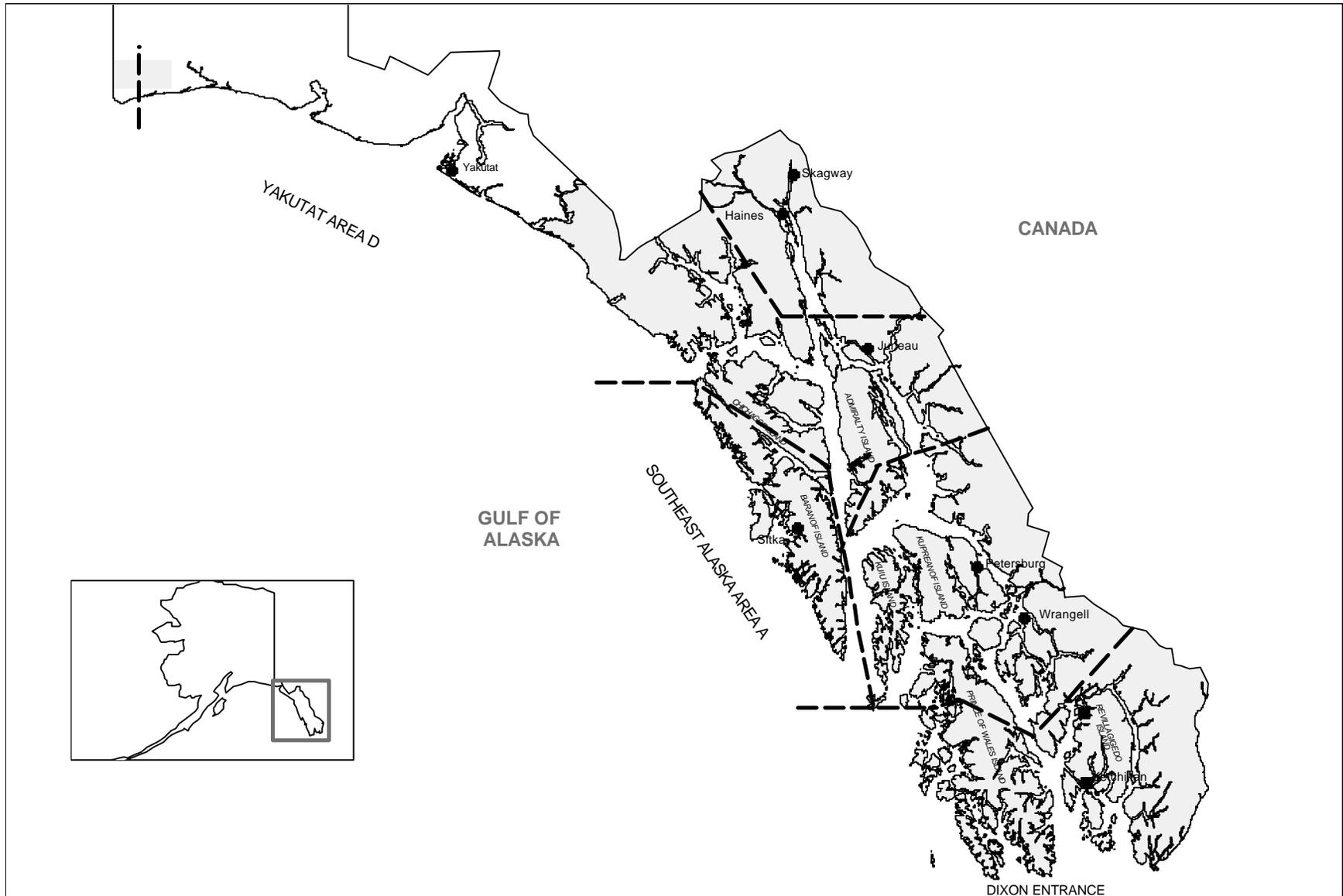
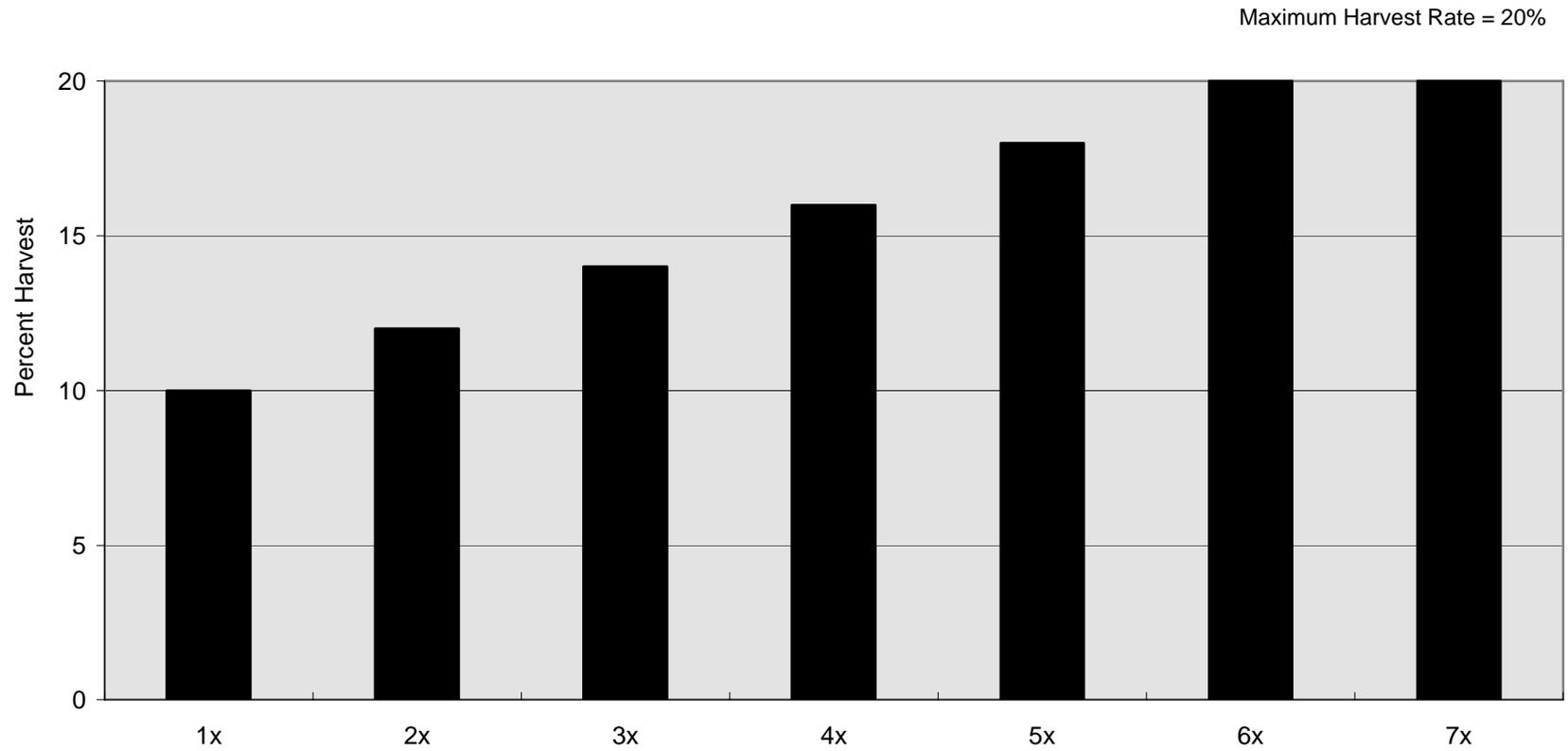


Figure 1. Southeast Alaska Region (Region 1) herring registration areas (Southeast Alaska Area A and Yakutat Area D) and management area boundaries.

Estimated mature population biomass expressed as a multiple of the threshold level.



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Figure 2. Generalized harvest strategy for Southeast Alaska herring stocks showing allowable percent annual exploitation rate as related to estimated biomass of mature stock expressed as a multiple of the threshold level.

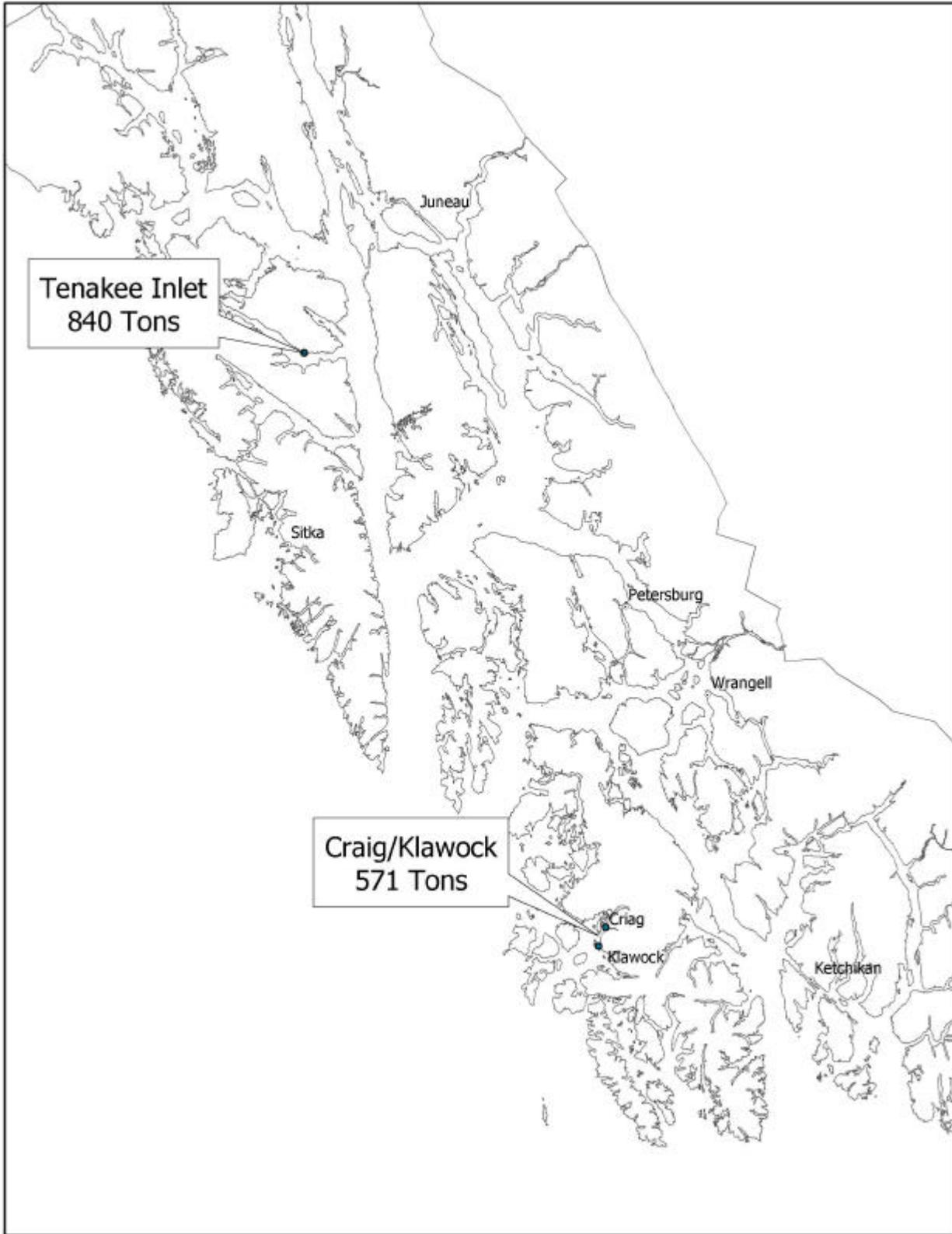


Figure 3. Food and bait fishing areas and guideline harvest levels, 2001–2002 season.

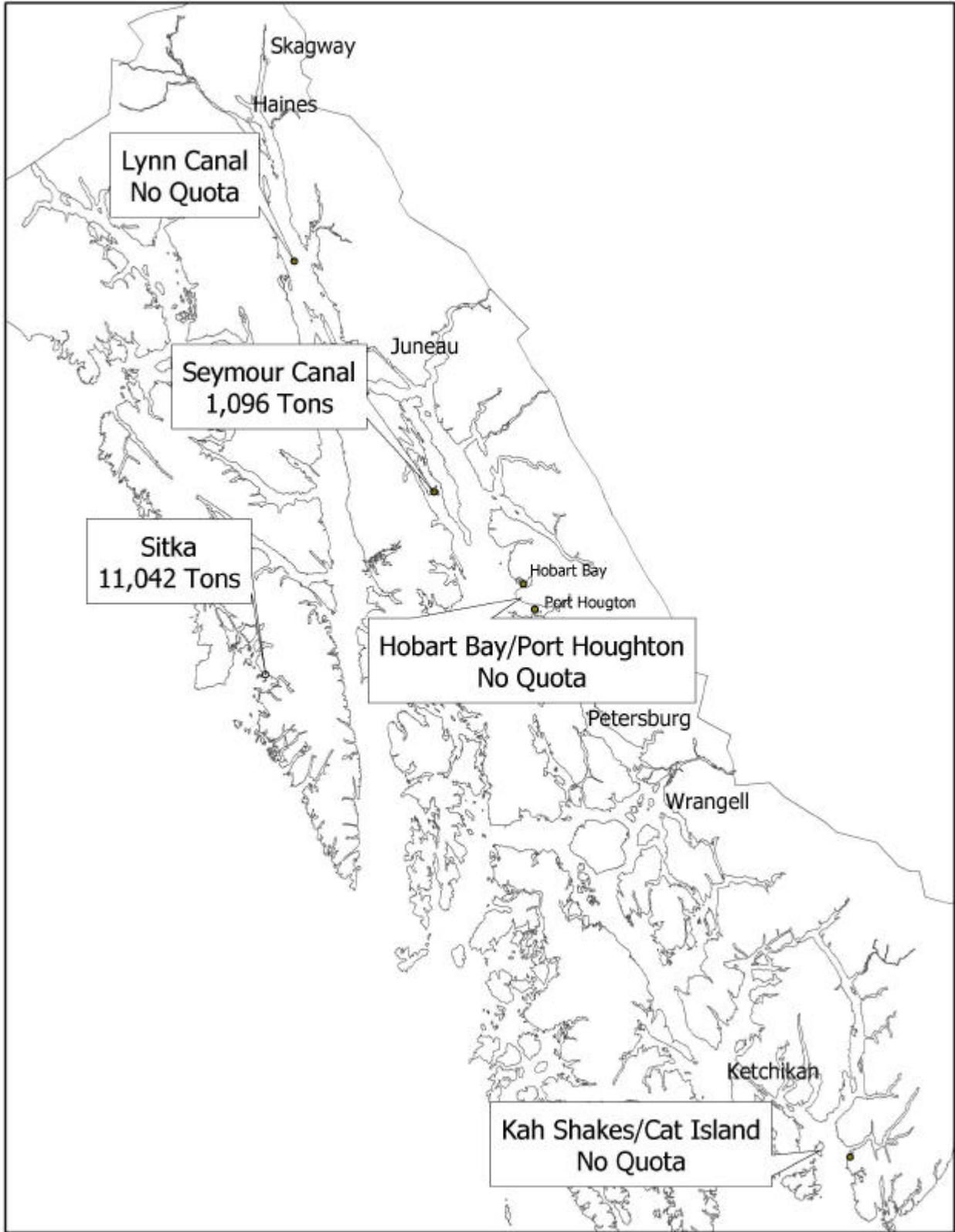


Figure 4. Sac roe Fishing Areas and guideline harvest levels, 2002.

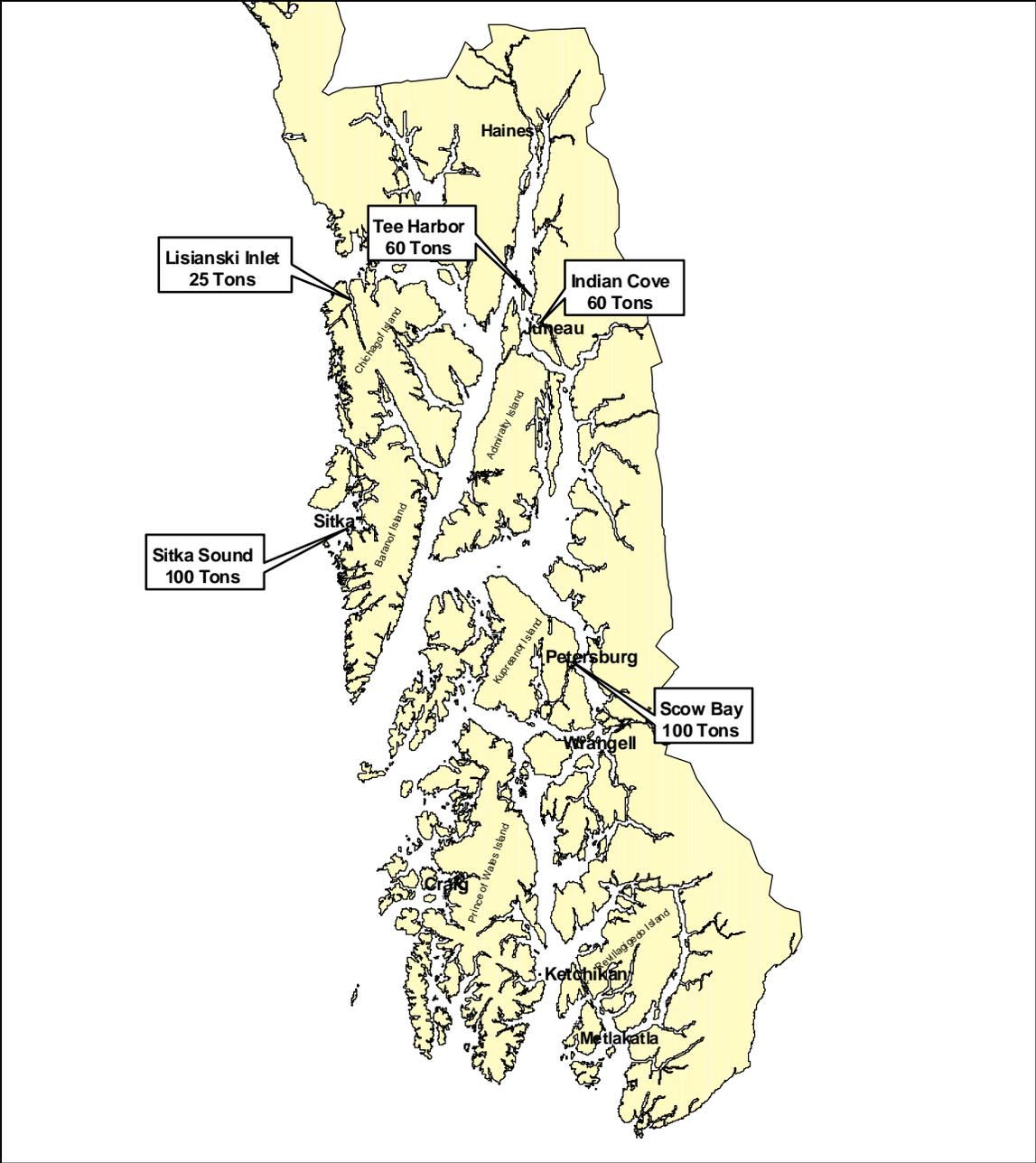


Figure 5. Fresh bait pound fishing locations, guideline harvest levels, — Southeast Alaska.

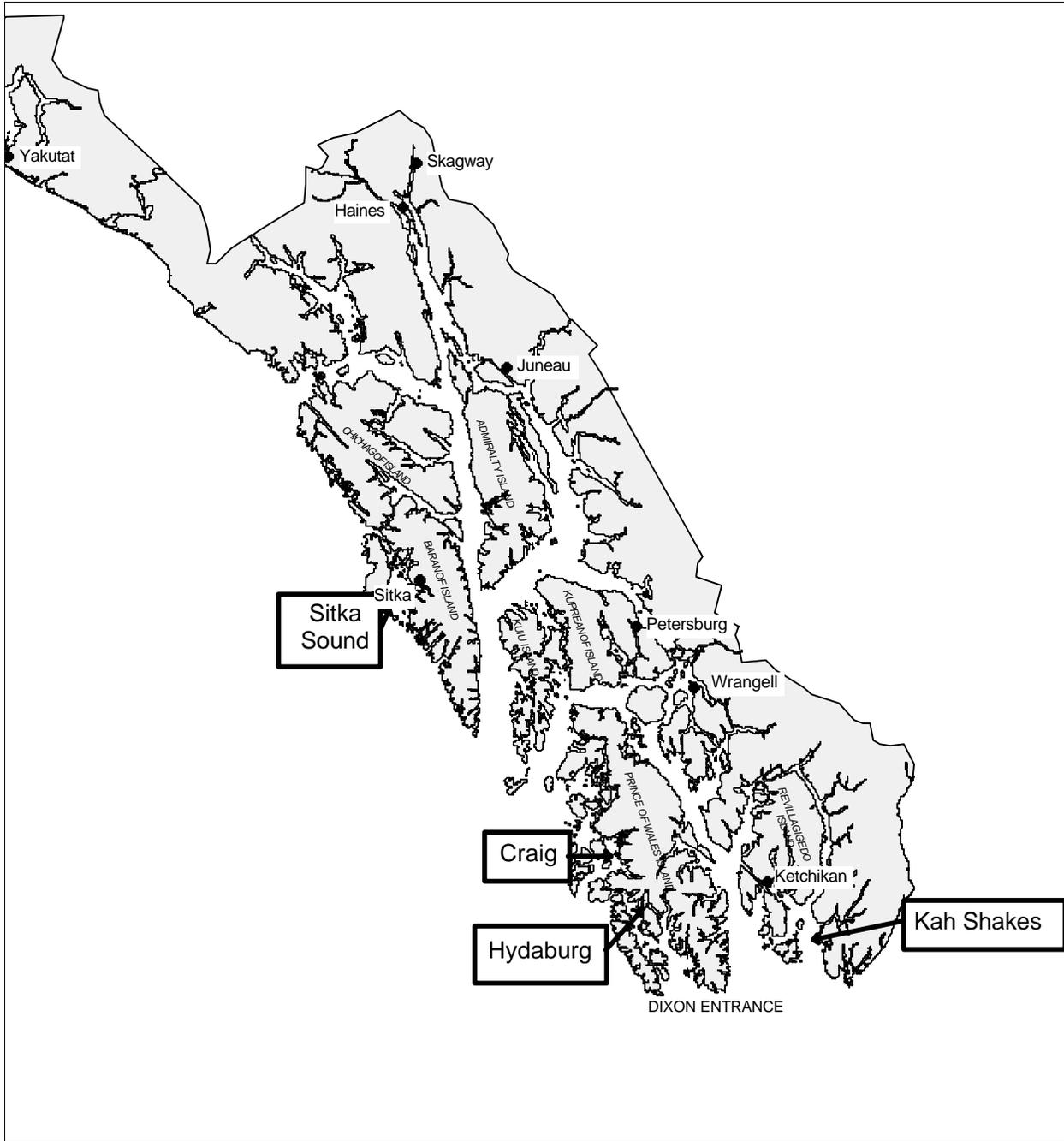


Figure 6. Major Southeast Alaska spawn-on-kelp subsistence fishery areas.

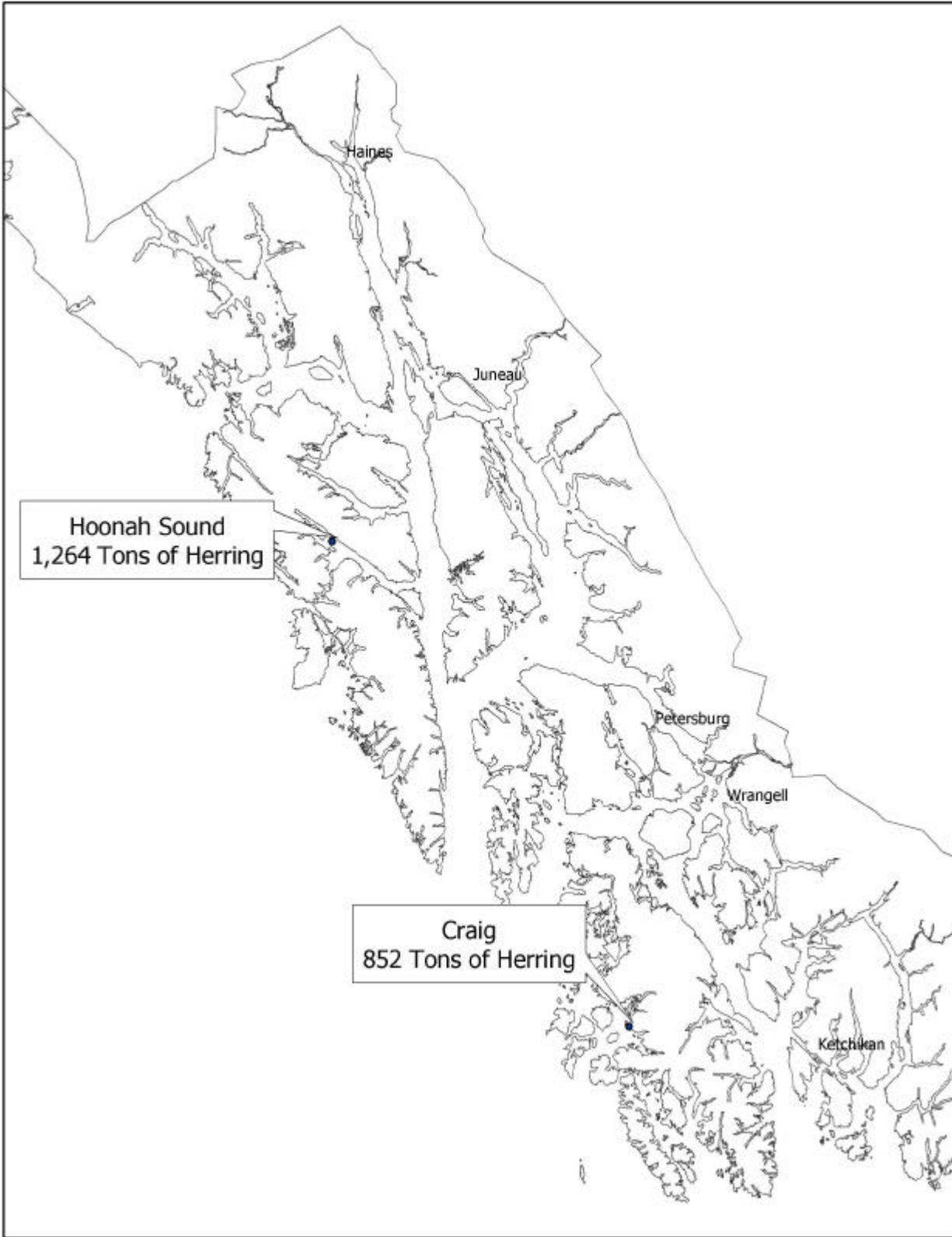


Figure 7. Spawn-on-kelp pound fishing areas and guideline harvest levels, 2002.

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